

Dependence between Information-Communication Technologies and Some Parameters of Globalization

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In spite of the catastrophic wars and the social concussions the twentieth century was a time of exponential growth of science, technologies and economy. In different times and in different regions separate countries and groups of countries took great efforts to overtake the countries that outstripped them applying for this goal various overtaking strategies.

Just when it seemed that the outstripping countries would run the developed countries down then the latter responded in an asymmetric manner passing on to a qualitatively new type of economy, the knowledge based economy. This type of economy possesses a powerful potential, a substantial element of it being the extensive development and the usage of the information-communication technologies (ICT). It is not at all accidentally that giving just 8-10% of the gross domestic product (GDP) of USA, ICT promote 30% of the growth of this product. The upheavals in the USSR and the serious and long crises in a series of countries in the Asian-Pacific region and also in Latin America can be explained also with their insufficient innovative possibilities and their inadequate adaptation to the changing world economy, the insufficient usage of contemporary ICT being not on the last place.

The world changes and the term “globalization” took a honorary place in a series of scientific research directions.

Once ICT became a powerful instrument for development, it is rather substantial to estimate what is the mutual dependence between the currency of these new technologies and the different processes of globalization.

The present work is an attempt to examine this dependence based on a statistical material and also on analyses by generally acknowledged and widely used references from [1] to [6]. The data for the information-communication technologies are cited from the professional issue [4] of the International Telecommunication Union (ITU). It is possible to find in [6] the used below coefficients of correlation analyses of the data from significant aggregates of countries.

The conclusions and recommendations in this paper are based on the used statistical material; at least this was the author's striving.

1. Definition and interpretation of the globalization index

Based on a respective research activity [5] introduces a globalization index for 60 countries with a developed, developing or undeveloped economy. It supports sufficiently grounded estimates of substantial aspects of the socio-economic state of separate countries. The globalization index is defined for a series of indicators divided in the following four groups:

a) The first group consists of realized transborder contacts, international phone conversations, international financial streams and transactions;

b) The second group includes the number of the INTERNET users, the INTERNET-hosts, the security level of the international network service, the realized international business contacts;

c) The indicators of the third group are connected with the degree of economic integration. They are used to report the transborder movement of goods, services and the transparency of the national borders via comparing the domestic and international prices;

d) The fourth group indicators counts for the movement of finances, the direct foreign investments, the instruction portfolio, the level of incomes and of the realized payings, the international ones included.

Table 1 contains the globalization indexes for 10 out of the first 20 countries with the highest globalization index. They are arranged according to the decrease of this index. The columns with numbers from 3 to 6 of the same table show the relative portions from the globalization index respectively for: the goods and the services; the finances; the contacts; the technologies. The globalization index is in relative units and its maximal value of 100% agrees with the country with the highest indicator – Singapore.

Table 1

No	Countries	Globaliza- tion index	Portion of the globalization index for			
			Goods and services	Finances	Contacts	Techno- logies
1	2	3	4	5	6	7
1.	Singapore	100	12.5	33.75	40	13.75
2.	Holland	86.25	5	56.25	16.25	8.75
3.	Finland	71.25	2.5	36.25	12.5	20
4.	Ireland	71.25	8.75	22.5	32.5	7.5
5.	Great Britain	55	3.75	26.75	16.25	8.75
6.	USA	47.5	2.5	11.25	5	28.75
7.	Germany	40	2.5	20	11.25	6.25
8.	France	38.75	2.5	18.75	13.75	3.75
9.	Hungary	36.25	5	11.25	17.5	2.5
10.	Malaysia	33.75	8.75	11.25	12.5	1.25

The analyses and comparisons of the globalization indexes of 60 countries [5, 6] provide a possibility to inference the following most common conclusions:

1.1. The portion of the technological factors increases continuously in the globalization index. This increase has almost doubled for the period from 1995 to 1998: from 19% to 36%. The basic role among these factors belongs to the ICT which become a driving power of the globalization processes. This is due to a series of solid trends: decrease in the cost of the interurban phone conversations and also of the linked to it increase of the international teletraffic activity which in 2000 exceeds 100 milliard minutes; increase of the on-line working persons: now they are more than 250 million men; constant increase of people realizing a direct contact between themselves in different locations on the planet.

ICT outline new possibilities for an intensification of the globalization processes. Sometimes it leads to unacceptable consequences: a currency of racism and pornography, implantation of antihuman outlooks, etc. The socio-political aspect of the ICT impact cannot be estimated sufficiently precisely by quantitative indicators. Reliable estimates can be obtained in the financial domain. It is determined that the streams of shares and assets that have crossed the borders have increased compared with the same in 1970: 54 times for USA, 55 times for Japan and 60 times for Germany. Every day the borders are crossed by 1.5 milliard USD. These processes are favored most widely by the development of the E-commerce and the E-business.

On the other hand the rates of increase of the technological factors overtake the ones of the economic globalization. During the period 1995-1998 the first ones have increased three times while the second ones have just doubled. One of the substantial reasons for this are the paroxysmal phenomena during the previous decade in the countries of South-Eastern Asia, Latin America and Russia.

1.2. It follows from the data in [5, 6] that the small countries are at the first place among the countries with the greatest globalization index. A reason for this is the postulated fact that these countries are more accessible for foreign goods, services and capitals than the bigger countries possessing a considerable domestic market. In other cases it is the profitable geographic position as it is the case with Holland and Singapore. It is possible to register central offices of the international companies provided there are well educated and highly qualified specialists in the respective countries as the case is with Switzerland and Sweden.

The example with Singapore is worth mentioning. According to the number of international contacts and the teletraffic per capita of the population it overtakes the other countries and it is estimated highest by the globalization index. Finland is interesting with its growth of the technological factors and the competitiveness indicators as it on a level with countries like USA and Germany.

1.3. It is established that during the last years the globalization index grows continuously. For the period from 1995 up to 1998 it has doubled for the countries with a developed economy while for the group of the developing countries and for the same time period it has increased hardly with 20%. Worldwide the globalization index has increased 1.7 times at the average.

A trend emerges that the developed countries depend less and less on the developing countries. 40% to 60% of the used metals in USA are obtained by a secondary processing of out-of-use devices. Already there are car catalysts without platinum, photomaterials without silver and chips without golden coverage of the contact pins.

If the stated rates of change for the globalization index remain and so the correlated with it GDP per capita of the population remains then it is evident that the developed countries will become more and more developed and the marginal countries – more and more marginal.

It seems that all this confirms the thesis that the globalization is the fate of the developed countries and that the localization is the fate of the all remaining countries.

The following below Table 2 shows the coefficients of mutual correlation between the globalization index and its relative portions. They (and the correlation coefficients from the subsequent tables) are calculated for an aggregate of data for 60 explored countries [6].

Table 2

No	Indicators	Globalization index	Goods and services	Finances	Contacts	Technologies
1	2	3	4	5	6	7
1.	Globalization index	1	0.45	0.81	0.64	0.51
2.	Goods and services	0.45	1	0.17	0.69	0.18
3.	Finances	0.81	0.17	1	0.25	0.25
4.	Contacts	0.64	0.69	0.25	1	0.04
5.	Technologies	0.51	0.18	0.25	0.04	1

The negative values of the coefficients for correlation mean that the increase of one of the quantities is coupled with a decrease of the other one.

It follows from Table 2 that the correlation index depends most of all on the financial factors followed by the contacts, the technologies and the goods and the services. Also from the same table it is evident that the four groups of factors on which the globalization index depends are weakly mutually correlated, i.e. they are comparatively independent one on another.

2. Dependence between the globalization index and the usage of information-communication technologies

Most generally the state of ICT is estimated by the accepted by the International Telecommunication Union indicators: number of phones for 1000 men, number of personal computers (PCs) for 1000 men and number of INTERNET-users for 10000 men. The GDP per capita of the population is accepted as a basic macroeconomic indicator.

Table 3 contains the respective data for ten compared countries ranked according to the decreasing globalization index. The same table contains data about the indicators of ICT and the GDP per capita of the population. The rows with numbers from 11 to 15 contain analogous data for five other countries without the globalization index as they are not among the 60 most compared countries in [5]. These countries are ranked according to the decreasing GDP per capita of the population.

Table 4 show the correlation coefficients between the globalization index and the three ICT indicators that are calculated on the basis of the whole aggregate of explored countries.

Table 3

No	Country	Globalization index	ICT indicators			GDP per capita of the population, USD
			Phones for 1000 men	PCs for 1000 men	Internet-users for 10000 men	
1	2	3	4	5	6	7
1.	Singapore	100	482	436.6	2968	24150
2.	Holland	86.25	607	359.9	2381	25140
3.	Finland	71.25	567	360.1	4034	24730
4.	Ireland	71.25	478	404.9	2101	21470
5.	Great Britain	55	567	302.5	2576	23590
6.	USA	47.5	664	510.5	3465	31910
7.	Germany	40	590	297	2433	25620
8.	France	38.75	582	221.8	1445	24170
9.	Hungary	36.25	371	74.7	699	4640
10.	Malaysia	33.75	203	68.7	1504	3390
11.	Turkey	-	278	38.1	304.4	2900
12.	Russia	-	210	42.9	136.12	2250
13.	Romania	-	167	26.8	26.8	1470
14.	Bulgaria	-	354	26.6	283.4	1410
15.	China	-	86	16.1	176	780

Table 4

No	Indicators	Globalization index	Phones for 1000 men	PCs for 1000 men	Internet-users for 10000 men
1	2	3	4	5	6
1.	Globalization index	1	0.78	0.83	0.75
2.	Phones for 1000 men	0.78	1	0.89	0.87
3.	PCs for 1000 men	0.83	0.89	1	0.91
4.	INTERNET for 10000 men	0.75	0.87	0.91	1

The analysis of the data in Tables 3 and 4 leads to the following conclusions:

2.1.1. The globalization index depends strongly on the three ICT indicators and the respective correlation coefficients are in intervals from 0.75 to 0.83. This index is influenced most of all by PCs for 1000 men, less by the phones for 1000 men and even less by the Internet users for 10 000 men. From all this it follows that the rise of the ICT usability helps an increase of the globalization level for the economy and at the same time it depends on it. It is possible from the same table to inference that the separate ICT indicators are strongly mutually correlated. It is so because the increase of the phones and of the PCs leads also to an increase of the Internet users.

2.1.2. During the last years the term “digital partition” of the world obtained a currency. Taking under consideration that the digitalization of the information is connected basically with ICT then this partition shows also the degree of the ICT

usage in different parts of the planet. The multiple research and the data from Table 3, too, confirm the fact that the currency of ICT in the developed countries exceeds several times the analogous indicators for the other countries. It is not clear how and when this difference will degrade. On the other hand there exists a “digital partition” also inside the group of the developed countries. For example in USA the relative indicators for the assembled wiring links are five times greater than the same for the middle European ones and the analogous indicators of the Scandinavian countries are three times greater than the statistical at the average ones for Europe. Among the specialists at present there exists an unanimous opinion that in the domain of ICT there exists a technological tearing off of USA and the Scandinavian countries from the other regions worldwide.

2.1.3. The presented in Table 3 data do not form a notion for the “digital partition” in the different regions of one and the same country. It is typical for the poorly developed countries in Asia, Africa and Latin America that the stationary phone lines and mobile connections are concentrated in the biggest cities and that the population of vast regions is robbed of an efficient phone connection and of Internet, too. The ‘digital partition’ exists also in the separate developed countries but to a much smaller extent.

The data from Table 3 for the three indicators of ICT and for GDP per capita of the population allow the determination of the relation between these values, i.e. the estimation of the degree to which the usage of ICT influences the increase of the economic efficiency. Table 5 presents coefficients for mutual correlation between GDP per capita of the population and the relative number of phones, PCs and INTERNET-users. They are calculated for an aggregate of 150 countries.

Table 5

Indicator	Phones for 1000 men	PCs for 1000 men	Internet for 10 000 men
GDP per capita of the population	0.91	0.92	0.85

Based on the data from the last two tables it is possible to draw some inferences:

2.2.1. GDP per capita of the population is rather strong: almost linear, in correlation with the number of phones and of PCs for 1000 men (coefficients of 0.91 and 0.92 respectively) and to a smaller extent with the Internet-users for 10 000 men: a coefficient of 0.85. Such strong correlation shows that it is not possible to build a modern and efficient economy without such type of technologies.

2.2.2. The five last in the series countries from Table 3 give way to the rest of the countries for all indicators from the same table. It is only the number of phones for 1000 men that Bulgaria, Turkey and Russia overtake Malaysia. For such indicators it is for certain to prognosticate that the globalization index for the last five countries from Table 3 will be somewhere below 34.

The data from Table 3 convincingly show that countries with low ICT indicators and also with low globalization index possess a respectively low GDP per capita of the population.

2.2.3. It is evident from Table 3 that at present Bulgaria occupies an unenviable position with times lower indicators for ICT and GDP per capita of the population than the countries with innovatively-oriented economy. It starts earliest from all Eastern-European countries in the domain of serial production of magnetic drives and also of

PCs; it had a high degree of telephonization and not a bad GDP per capita of the population but now it lags behind almost after all these countries according to the same indicators. If the trend of dropping in the education and in ICT is not stopped than it is not possible to expect in the prognosticable future a leveling with the countries which overtook us economically [7].

3. Dependence between the economic inequality of the population and the globalization

The realized in [3] research defines the economic inequality as the difference in the income of the population and it is measured by the index of inequality of the income. This index is a relative quantity and it is a percent of the maximal meaning of this inequality. The maximum of 100% is set for the contemporary state of the economic inequality in the South African Republic.

The next table 6 introduces data for the globalization index, the inequality index, the GDP per capita of the population and the number of the population for every country from the group of the 10 investigated countries. They are ranked according to the decrease of the globalization index.

Table 6

No	Country	Globalization index	Inequality index	Macroindicators	
				GDP per capita of the population, USD	Population, $\times 10^6$
1	2	3	4	5	6
1.	Singapore	100	-	24150	4
2.	Holland	86.25	54.3	25140	16
3.	Finland	71.25	42.85	24730	5
4.	Ireland	71.25	60	21470	4
5.	Great Britain	55	62.85	23590	60
6.	USA	47.5	68.6	31910	278
7.	Germany	40	51.4	25620	82
8.	France	38.75	57.1	24170	59
9.	Hungary	36.25	51.45	4640	10
10.	Malaysia	33.75	82.85	3390	23

Table 7 contains the coefficient matrix of the correlation between the globalization index, the inequality index, the GDP per capita of the population and the number of the population. The coefficients are determined on the basis of an aggregate of 60 countries.

The data from both tables 6 and 7 lead to the following conclusions:

3.1. The existing widely spread opinion that involving the separate countries in the globalization leads synonymously to an increase of the inequality of their population is not confirmed by the results from the statistical processing. The coefficient of correlation between the globalization index and the inequality index of the population (Table 7) possesses a value of minus 0.59 and it means that there exists a trend at the average for a decrease of the inequality with the growth of globalization. Comparatively

Table 7

No	Indicators	Globalization index	Inequality index	GDP per capita of the population, USD	Population, $\times 10^6$
1	2	3	4	5	6
1	Globalization index	1	-0.59	0.79	-0.29
2	Inequality index	-0.59	1	-0.57	0.11
3	GDP per capita of the population	0.79	-0.57	1	-0.23
4	Number of the population	-0.29	0.11	-0.23	1

low value of this coefficient means that the dependence between the two indexes (of inequality and of globalization) is not so strong and also that they can be given as examples confirming the examined trend and also as examples which do not agree with it. There are examples of missing relations between the population inequality and the globalization.

It follows from Table 6 that Holland has a greater globalization index (86.25) and a smaller inequality index (54.3) than the last country in this table – Malaysia for which these indicators are respectively 33.75 and 82.85. This confirms the shown trend. It is possible to point out also an inverse example. The comparison between Holland and Germany shows that the first of them possesses a globalization index which is twice bigger (86.25 against 40) and a greater inequality index (54.3 against 51.4) than the second country. Countries like Chilly, Russia and China develop a market-oriented economy but they have lower globalization indexes, lower income per capita of the population and a greater inequality than other countries which also develop market-oriented economies but with greater globalization indicators and also with lower inequality degree like Hungary, Czech Republic, Poland.

3.2. The last two tables show a considerable positive correlation between GDP per capita of the population and the degree of globalization. The respective coefficient of correlation between these two quantities is equal to 0.79 which means that the increase of the globalization index is coupled with an increase of the GDP per capita of the population and vice versa. The trend is typical for all countries in Table 6 except for USA and Germany compared with the first five countries in the same table. In this case just like in item 3.1, the strong positive correlation between the globalization level and the GDP per capita of the population should not be treated as some absolute rule but rather as a statistical statement at the average that is followed in most cases but not always.

3.3. The determination of the inequality indexes uses subjective expert estimates to a much greater extent than for the other indexes. The inequality of the population depends on a set of other factors like the social programs and the educational system, the control over the prices, the norm arrangement, etc., which are very difficult to be estimated with precise quantitative ratings. This not at all decreases the necessity of such ratings and also from their reasonable interpretation.

As a whole the data from Tables 6 and 7 show that the increase of globalization and the related with it increase of incomes per capita of the population leads as a rule to “smoothening” of the inequality among the people in the developed countries to a greater degree than in the case with the population of the other countries. And this is no novelty for sociologists or for some of them at least.

4. Globalization and marginalization

The antiglobalist movement treats the globalization processes most of all in a social aspect. By nature the protests are against the fast and unprepared liberalization and against the involvement of a given country in the strongly concurrent global economy without its preparation for that. This in turn leads to a negative growth of economy, unemployment, emigration of the qualified staff and so on. The data analysis shows that here we have a confusion of the two different things. The true antiglobalism should postulate the problem in a different way: on the first place the governing elite should prepare its country for such transition, it should create conditions for a growth of its innovative and economic potential, the wide usage of ICT included and then the country should be directed towards a gradual involvement in the global competition. Because this is the only way to ensure a stable growth and a stable position under the sun. And this was done not long ago by Finland and Ireland. More and more a point of view gets its way which considers the true globalization as an objective and necessary process. It follows from the cited data that the greater the globalization is, the greater are the following quantities: GDP, income per capita of the population and as a rule to a smaller inequality in the very country. The case when the globalization parameters become worse means greater poverty, less vanguard technologies and a greater inequality of the population and the corollary is a greater marginalization. From this it follows that the real danger for the countries in the arrier is the receding from the developed center and setting out on the way to the periphery.

The inference which follows is that the inverse meaning of the term “globalization” is not the “antiglobalization” but the “marginalization”.

If the scope includes the Eastern-European countries then it is evident that they confront with a difficult future. Becoming an EU member does not guarantee any of them the way that should follow: to the center or to the periphery. Every country will solve its problems in an individual manner. And it shall have its own future; our country, too.

There is a consideration of a general character. The ascertainments from the statistical material can be treated as a corollary of a queer digital model of the parameters of some socio-economic processes connected with the globalization, the inequality, the usage of ICT and with the changes in the macroeconomic indicators. Just like any other digital model they reflect the real processes with some accuracy and with some approximation. It is so also due to the fact that the determination of some indexes is realized on the basis of expert estimates which are not free of a subjective element. Therefore it is not necessary to overrate the preciseness of some inferences. Still the possibilities of such digital models must not be underrated concerning trends which very often are not on the top and which are not visible with an uneducated eye.

Conclusion

In 1992 the World Bank issued a report for the annual development which contained the following most general conclusions:

- The countries with higher qualification of the labour and with a more stable innovative climate have the trend to greater returns;
- While the developing countries do not ensure a greater control over the 'knowledge industry' they shall collapse under a smaller surplus value;
- There is no perspective that the world will reach an equal distribution of the physical capital;
- The rich and poor countries compete in a global market economy as unequal partners;
- As a whole the new information technologies will increase furthermore the difference between the rich countries and the poor countries.

It is evident that these conclusions have lost nothing of their actuality nowadays, too.

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Зависимость между информационно-коммуникационными технологиями и некоторыми параметрами глобализации

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(Резюме)

В работе обсуждаются зависимости между распространением информационно-коммуникационными технологиями (ИКТ) и некоторыми параметрами глобализации – объем товаров и услуг, состояние финансов, международные контакты и состояние технологий. Показано, что существует почти линейная положительная связь между распространением ИКТ и параметрами глобализации и значительная отрицательная зависимость между ИКТ и неравенством населения. Сделаны выводы, относящихся к распространению ИКТ в странах Центральной и Юго-восточной Европы.