Comparative typology of countries on income level and income distribution

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Abstract

The article specifies connection between institutional factors and economic development by the instrumentality of econometric macro-analysis (based on cross data of 120 countries). Especially is under the observation income distribution equality in connection with human capital and income level. Income equality as an indicator of society's social cohesion is relatively little correlated with economic freedom level, which allows consider them as independent factors of income level. The direct impact of those two institutional attributes (in case of human capital taken in constant level) proves to be different directions. If the impact of economic freedom is positive, then the regression coefficient of income equality remains moderately negative. Hereby, we may say that in case of constant human capital level (and economic freedom) occurs with more equally distributed income also in its lower level. Both institutional variables are important positive factors for development of human capital. Consequently of that appears strong indirect positive effect of those two factors on income level. Therefore, the general impact of income equality turns out to be also statistically essentially positive – more equality added with human capital compensates possible negative direct effect with excess. The positive impact of economic freedom however duplicates in altogether.

On the base of empirical study we can define three relatively stable groups of countries with certain model of society and economy:

I. Latin-American model,

II. Anglo-American model of liberal societies,

III. Continental-European model and Nordic welfare societies.

Last two are observed as success models, which optimal reconcilement to its concrete historical-cultural peculiarities is essential target of each country. In the article the choices of Baltic countries in their transition period are also pointed out.

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Introduction

Economists have recognized the role of institutional factors in explaining economic development since the works by D. North. They determine the effectiveness of production factors (labor and capital). Poor institutions cause big transaction costs and X-ineffectiveness: production factors are not used in the best possible way.

However, researchers have not come to an agreement on institutions, which are the best in reducing X-ineffectiveness. Here compete two theoretical approaches. Liberal theorists emphasize motivational aspect of institutions viewing Schumpeterian inward individual success aims as the major developmental force, which is framed by mutual competition. Therefore is understandable, that economic freedom is raised to the main criterion of institutional quality. At that, under the economic freedom is not kept in mind all-justifiability, but first of all transparency and stability of economic environment, which exclude unpleasant unexpectedness for investors (Gwartney *et al* 2006). More socially oriented theoreticians, on the other hand, see individuals' non-market cooperation as the main factor of development and stress the importance of different networks as communication channels as creators of mutual trust (Allik *et al* 2004). In general the social capital is considered as a developmental factor. Frequently the notion of social capital is also related to the concept of social cohesion, what in economical sense means moderate inequality in individuals' economic welfare.

Upon closer examination, the two aforementioned trends of thought are not contrary and include many points of contact, amongst others in question of equality. While, for liberals equality of opportunities is in uppermost and more socially oriented thought leads rather towards final results (income distribution), thus moderate inequality as welfare factor is also accepted in theory of social justice (Rawls 1971:303).

The aim of the article is to analyze opportunities for two dimensional classification of different countries' economic models, where income distribution appears as an independent attribute besides of income level. This is reasonable in a case, if appears independency of those attributes or possibility to make them independent in the first phase. For that purpose there has been tried to specify empirical connection between income level and human capital and main institutional attributes of economic system – economic freedom and social cohesion.

It is remarkable, that diversity of economic connections has become the object of special interests in recent years. Just one example on the issue is the Nobel Prize in Economics given to Edmund Phelps, who also has raised the question of institutional economic model dependency from society's cultural background besides his main works connected to inflation, supports relevancy of the topic (Phelps 2006).

In the analysis we work with minimal number of indicators in order to get the best survey. For example, we limit only with *Heritage Foundation* general indicator for description of economic freedom and Gini coefficient for social cohesion. For measurement of income level and human capital we will use corresponding indexes from the Human Development Report by the UN.

1. Data

We primarily use the Human Development Report 2005 offered by the UN[1] (thereby, cross-data). Essentially, the data characterizes the situation with a two-year lag – in 2003.

where
IL – income level (GDP *per capita*), what is measured by the income component of the human development index (apostrophe indicates predicted level from model);
HC – the level of human capital measured as a multiple of the education and health (life expectancy) components of the human development index (HC = e*h);
IE – the level of income equality, what is deduced from the inequality Gini coefficient (IE = 1- GINI).

That acquired indicators are all standardized at intervals (0;1). The empirical basic statistics of the data on 120 countries is presented in Table 1. Associated paired correlations are described in Table 2.

Table 1. The fundamental statistics on the income levels and its factors

	IL	*IE*	*HC*	*e*	*h*
Average	0.67	0.60	0.58	0.80	0.68
Median	0.68	0.62	0.66	0.87	0.76
Standard variance	0.19	0.10	0.26	0.20	0.21
Minimum	0.28	0.29	0.05	0.16	0.12
Maximum	0.99	0.75	0.91	0.99	0.95

Source: compiled by the authors.

Table 2. The correlation matrix of income level and its factors

	IL	*IE*	*HC*	*e*	*h*
IL	1.00				
IE	0.34	1.00			
HC	0.85	0.50	1.00		
e	0.77	0.36	0.88	1.00	
h	0.78	0.51	0.95	0.72	1.00

Source: compiled by the authors.

Generally all the indicators under examination are mutually positively correlated – in wealthy countries the human capital is larger, economic freedom higher and income distribution more equal. At the same time, the following facts are also obvious:

- The integration of education and health into one indicator of human capital is meaningful because the correlation of the combined indicator with income level is stronger than with either component separately (0.85>0.78);
- On the other hand, the indicator of income equality is significantly less closely tied to income level (0.34<0.85), which rather indicates a negative partial correlation.

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[1] http://hdr.undp.org/statistics/data/

3. Classification of countries on income equality and relative income level bases

Insofar as the connection between income level and income distribution (on the assumption of constant human capital) proved statistically irrelevant and non-robust, then the two factors may observed as two independent indicators of the concrete country's societal order. This certainly in case, if in prior eliminate the effect of difference in human capital. Then is possible to divide observed countries into four groups, according to income level (IL) and income equality (IE) relative level compared to the originating level of human capital with predictable level or with the norm (Table 3).

Table 3. Division of countries by income level (wealth) and relative level of income distribution equality

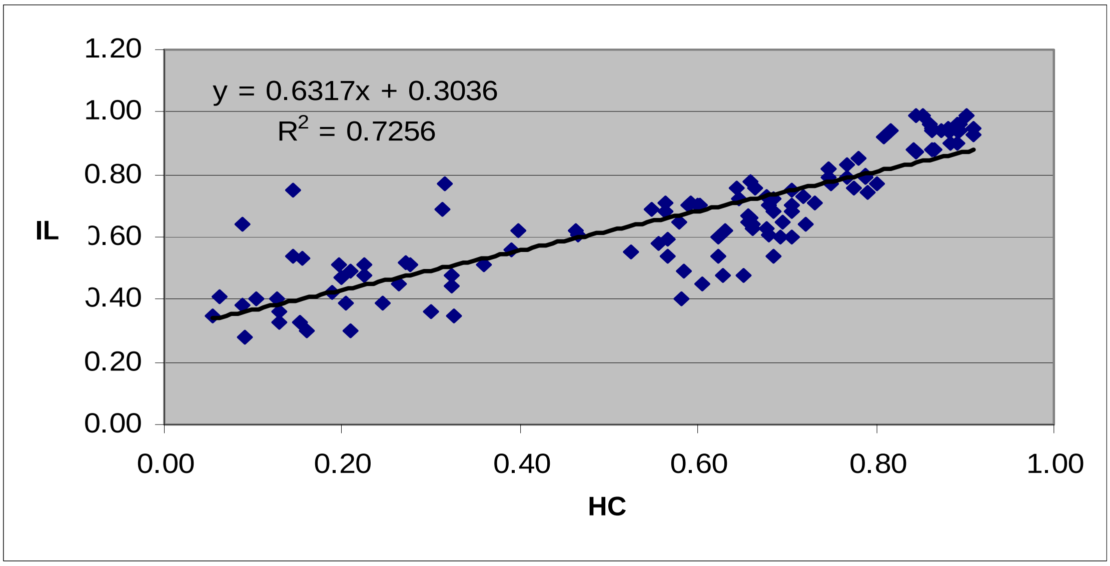
Income equality Income level	Below the norm	Above the norm
Below the norm	Poor and unequal	Poor but equal
Above the norm	Rich but unequal	Rich and equal

Source: compiled by the authors.

In order to make countries equal in terms of income level and income distribution we eliminate from both the difference of the effect of human capital at first. We start from connection between income level and human capital (Figure 1).

The connection between income level and human capital is rather close – mutually is described approximately 73% from variation. Visually is warranted also proximity of the connection to a linear.[2]

Figure 1. Income level connection with human capital

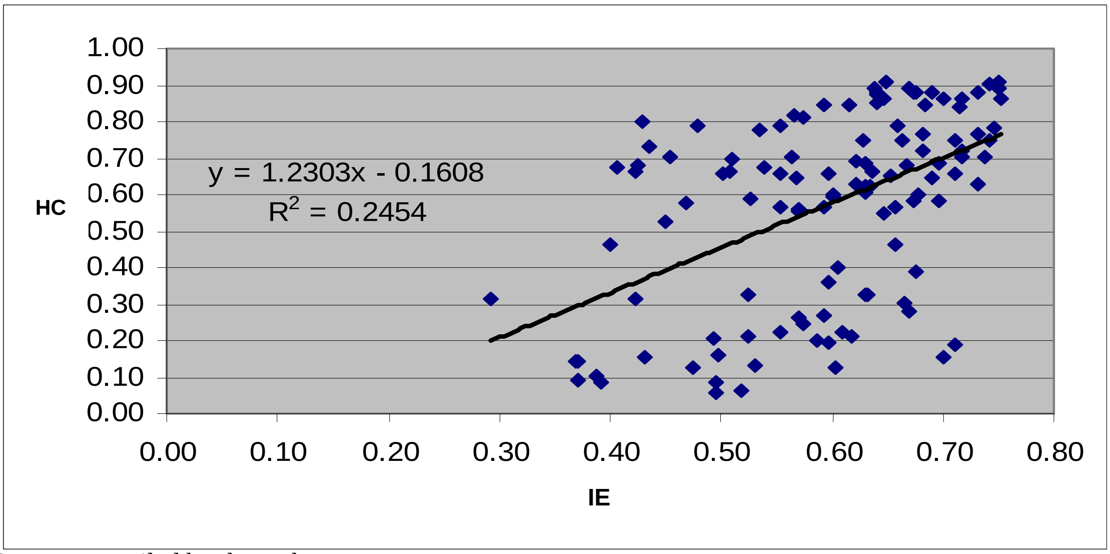


Source: compiled by the authors.

[2] At the same time data distribution is not one-peaked at least on the base of human capital, it means nor hereby also normal. In the current research this deviation however is ignored, because the hypothesis in content for differentiation of subgroups is missing.

Income distribution is also significantly connected with human capital, whereby increase in income equality causes also human capital to increase (Figure 2). Still the determination coefficient here is only 25%.

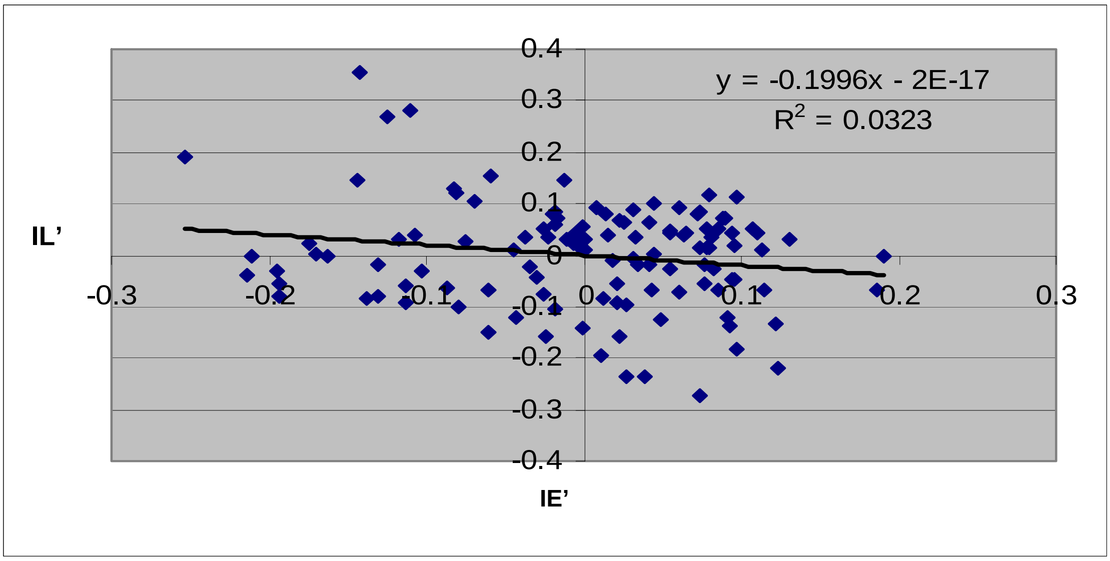
Figure 2. Connection between human capital and income equality



Source: compiled by the authors.

As following, we observe part correlation between income level and income equality (on the assumption of equal human capital). The corresponding deviations from regression line are in the Figure 3. Here appears expected weak negative correlation, whereby the regression coefficient is *ca* -0.2. The determination coefficient is still only 3%.

Figure 3. Connection between income level and income equality on the assumption of constant human capital



Source: compiled by the authors.

It is remarkable that countries divide into quadrants on Figure 3 relatively evenly (see also Annex 1 and Table 4). Still most countries (36) belong to the group that we can consider relatively rich and also with equal income distribution at the same time. This is contradiction to the negative part correlation.[3] At the same time, the number of countries, where incomes are low and also unequally distributed, is smallest (23). Therefore the deviation direction is same in 59 countries, what makes one less than number of countries, which have different direction deviations. In the case of last mentioned countries the distribution between two possible options is steadier. The number of countries, which are relatively poor, but with equal income distribution was 31, and rich, but unequal was 30. Such weak (part) correlation and relatively even distribution of countries by deviation, allows keep relative wealth and equality not as much to each others influencers as for few related dimensions (indicators) of social and economical systems of concrete countries.

Table 4. Number of countries grouped by income level and relative level of income distribution

Income equality Income level	Below the norm	Above the norm
Below the norm	23	31
Above the norm	30	36

Source: compiled by the authors.

If we try practically explain the division of countries into different quadrants, then appears quite clear and far from random structure. Joint denominators are in the following Table 5. In the Annex 1, there are corresponding countries given in bold font. At that, is also shown division by absolute income level separately in all the quadrants. Poor are here considered the countries, which belong to the lower part of the tabulation list, and rich these, which belong to the upper part.[4]

Table 5. Typology of countries by income level and relative level of income equality

Income equality Income level	Below the norm	Above the norm
Below the norm	Latin-American countries	Former socialist countries
Above the norm	Anglo-American liberal countries	Continental-European countries

Source: compiled by the authors.

I. Countries, which are relatively poor and also have unequal income distribution at the same time.

Here first of all belong practically all **Latin-American** countries.[5] At that, their characterization is not influenced at all by the fact, where do they belong in terms of absolute wealth, into the first half of the world (for example Chile and Argentina) or the second half (Bolivia and Honduras). Of course, backlog country by country is different by both dimensions. For example, in Argentina the income level

[3] In the case of very strong negative connection should practically exist only relatively poor, but equal countries and relatively rich, but unequal countries.
[4] Into both sides belong 60 countries, income index limit is 0.68. See also robustness analysis.
[5] Guatemala is only excluded.

almost corresponds to the human capital level, but the indicator of income equality should be *ca* 16 percentage points (pp) bigger. However, in Bolivia the income equality stays under the expected result only 4 pp, but income level even 12 pp at the same time. All in all the deviations from prognosis of income level and distribution stay here quite modest – only in Brazil and Chile the negative deviation from prognosis of income equality exceeds shortly 20 pp. Concisely these countries are characterized by incapability of using duly their existing human capital in economic life. Other countries belonging to this group is rather random. From larger countries, for example China and Nigeria belong to this group, but with modest deviations. Here may added, that just African countries are most heterogeneous in their location on particular scheme, be divided almost equally into all quadrants.

II. Countries, which are relatively rich and have equal income distribution at the same time.

Here are situating most **Continental-European** welfare countries, in front Norway and Switzerland, which in addition to relative richness in terms of human capital are characterized also by absolute wealth. Japan and Canada belong to this group as well. At the same time, here deviations from expected income level and income distribution stay even smaller than in Latin-American countries, mostly below 10 pp. Countries in this group have also the best accordance between human capital and income attributes. Nevertheless also some slightly poorer countries belong to particular quadrant. From one side, belong here the Central-European transition countries, which have followed gradual reform way (Slovenia, Czech Republic and others, from Baltic countries Lithuania). From the other side, also more stable Moslem countries (especially Northern-African Arabic countries) are situating in this quadrant and also interestingly enough Russia and Kazakhstan. Last perhaps is explained by circumstance, that relative wealth is here connected rather with natural resources than human capital.

III. Countries, which have relatively equal income distribution, but are poor at the same time.

Differently from above mentioned two **CIS** countries, the other members of this commonwealth belong just to this quadrant. Even more, many other former partly or totally socialist countries accrue to this group, especially those, what are characterized by longer or shorter development lag (for example Bulgaria, Romania and interestingly also Latvia and Poland). In all these countries relatively equal income distribution has remained, but at the same time they have not economically realized existing human capital so far. Just here form largest deviations from expected income level – for example in Tajikistan 27 pp, in Moldova and Kyrgyz Republic 24 pp. In group of wealthier countries, here the interval of course is limited only by some pp. In terms of income equality they are ahead from expected up to 10 pp. This kind of situation cannot be considered as very stable. Part of observed countries obviously can overcome the economic backwardness supported by existing human capital, but this backlog also may preserve on the background of insufficient incentives (suitable example is Cuba).

IV. Countries, which have relatively unequal income distribution, but are rich.

Mainly this last group is formed by so-called **Anglo-American liberal** countries – from New-Zealand to United States, but also Singapore and Hong Kong[6]. Interestingly belong to this quadrant also Southern-European countries (Italy, Greece, Portugal, also Israel). Here the deviations between real and expected income indicators do not form very considerable, staying in10 pp limits. Only United States and Ireland can generate 15 pp higher than predicted income level. Apparently it is related with other specific factors including historical features of these countries. Of course, we cannot ignore the fact that Estonia belongs to this group as well, its income index is 4 pp higher from human capital successive prognosis, when the income distribution equality is practically on the expected level – backlog less than 0.5 pp. Therefore Estonia does not differ much from II group core countries.[7]

As whole, there would not be enough from liberal and post-socialist countries to form noticeable medium (weak) negative part correlation between income equality and income level, and to exceed reverse impact of Latin-American and welfare countries. Big input gave here certain **post-colonial developing countries**, first of all Zimbabwe, Lesotho, Swaziland, Namibia, Botswana and South-African Republic. In all these countries exceeds income level predictable more than 10 pp, in Botswana even 35 pp. At the same time, these countries are characterized by relatively very high inequality (at least – 10 pp, in Namibia even 25 pp). These countries are more or less related with former apartheid regimes and from that is received deceitful socio-economical inheritance – relative wealth with relative inequality. The development dynamics is not clear also here – is there taking place leveling with economic impoverishment or is possible to preserve relative wealth and overcome inequality gradually. It is possible to point out, that negative part correlation disappears between income level and income equality, when we remove the data of 6 mentioned countries from the observation. However, here should be added, that certainly does not appear also contrary connection – equalizing the income does not bring higher income level as usual, when it is not accompanied by increase in human capital accordingly.

4. Position of Baltic countries by relative income level and equality

As we have seen from above, three Baltic countries belong to the three different groups of countries on the base of analysis. This fact is illustrated by the Figure 4, where we can see, that the differences between those countries are essential. If we add to this analysis more countries from each quadrant, which are typical to particular quadrant, and get a wider context, then we see that three Baltic countries are quite similar to each other (see Table 6 and Figure 5).

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[6] It is well-known, that these two countries are steadily leading different economic freedom competitiveness lists.

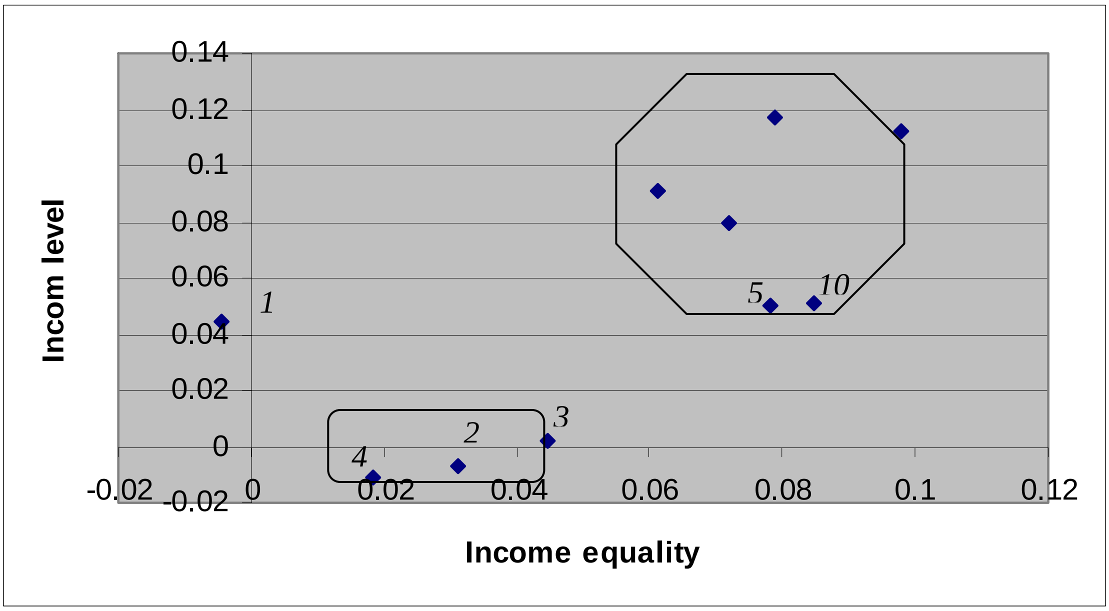
[7] Newsworthy should be cluster analysis in particular case, which is going to wait next researches.

Table 6. Relative income level and equality (differences of human capital eliminated) in selected countries (deviations from prognosis %)

Country	*IE%*	*IL%*
1. Estonia	-0.44	4.46
2. Latvia	3.12	-0.66
3. Lithuania	4.47	0.23
4. Poland	1.85	-1.09
5. Russian Federation	7.83	5.01
6. Germany	6.12	9.06
7. Finland	7.18	7.98
8. Denmark	9.78	11.23
9. Norway	7.89	11.73
10. Sweden	8.49	5.11
11. United States	-5.98	15.33
12. Argentina	-16.25	-0.09
13. Georgia	1.11	-19.57
14 South Africa	-12.45	26.69

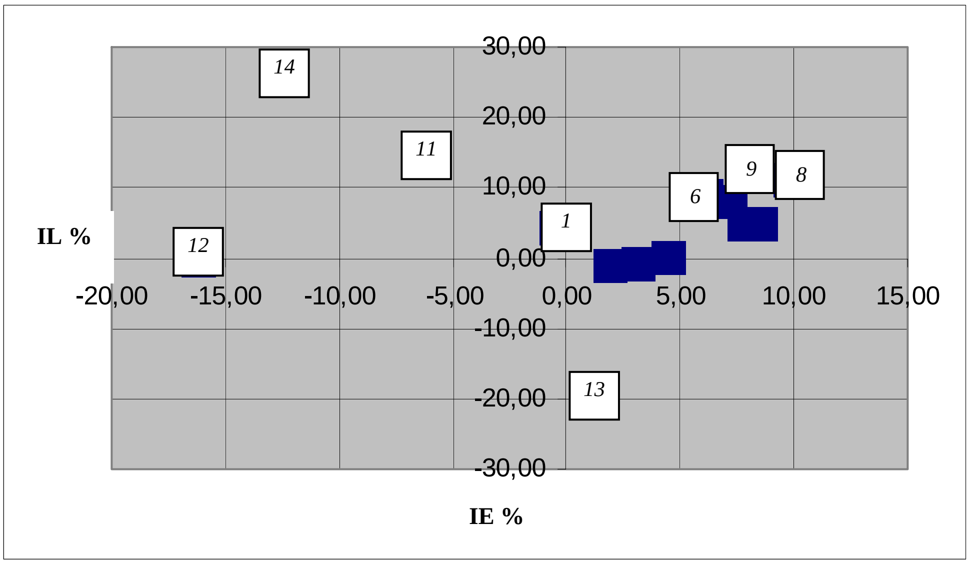
Source: compiled by the authors.

Figure 4. Relative income level and equality (differences of human capital eliminated) in Baltic countries (%, deviations from prognosis)



Source: compiled by the authors.

Figure 5. Relative income level and equality (differences of human capital eliminated) in selected countries (deviation from prognosis %)



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Conclusion

The article specified connection between institutional factors and economic development by the instrumentality of econometric macro-analysis (based on cross data of 120 countries). Especially was under the analyze income distribution equality in connection with human capital and income level. Income equality as an indicator of society's social cohesion was relatively little correlated with economic freedom level, which allowed consider them as independent factors of income level We can say that in case of constant human capital level (and economic freedom) occurs with more equally distributed income also in its lower level. Besides it both institutional variables are important positive factors for development of human capital.

The study showed relatively heterogeneity set of observed countries and described connections between income distribution and level stayed slightly robust. Practically forms the important negative part-correlation between income equality and its level on the base of poorer countries' data at the first place. In richer countries this connection dispersed. At the same time, remains the positive indirect effect through the human capital. Also proved to be relatively robust the positive direct and indirect effect of economic freedom on income level.

In the study appeared these groups of concrete (mainly the poor) countries, which caused the negative part-correlation between income level and income equality. Here are two following groups of countries:

1) the relatively big group of transition countries, where during the system exchange has not been accompanying consistent liberalization, and occurred economic recession is not duly reflected in income distribution; and
2) the relatively small group of post-colonial countries, where still are in place relatively high economic development level and large inequality inherited from apartheid regimes.

Both groups are clearly practical (temporal) and their possible development may go by three main ways, which are empirically defined as three relatively stable groups of countries (with certain model of society and economy) in the current study :

I. Latin-American way, where insufficiency in social mobility and cohesion does not allow to realize the human capital duly for economic development (in average income level);

II. Anglo-American way of liberal societies, where relative inequality in incomes sustains pressure and motivation for economic development and mobility in society makes possible to realize it;

III. Continental-European and Nordic welfare society' ways, where development factors evolve besides of competition forces or even instead of them ever more the resources connected to social capital.

Last two models are particular as success models, which optimal reconcilement to its concrete historical-cultural peculiarities is essential target of each country.

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Annex 1. Division of countries by income level and relative level of income equality

Income equality Income level	Below the norm		Above the norm	
	Poor	Rich	Poor	Rich
Below the norm	Sierra Leone Malawi Madagascar Zambia Nigeria **Bolivia** **Honduras** **Nicaragua** Armenia **Ecuador** Philippines **Paraguay** China **Salvador** **Venezuela** **Peru**	**Columbia** **Panama** **Brazil** **Uruguay** **Costa Rica** **Chile** **Argentina**	Tanzania Ethiopia Guinea-Bissau Yemen Kenya **Tajikistan** Rwanda Nepal **Moldova** Uganda **Kyrgyzstan** Laos **Uzbekistan** **Mongolia** **Cambodia** **Georgia** **Vietnam** Indonesia **Azerbaijan** Sri Lanka Jamaica Jordan **Albania** **Ukraine** **Belarus**	**Bosnia** **Macedonia** **Romania** **Bulgaria** **Latvia** **Poland**
Above the norm	Mali Central-Africa Gambia Zimbabwe Lesotho Guatemala Swaziland	Turkmenistan Namibia Dominican Republic Turkey Iran Thailand Botswana Mexico Malaysia South-Africa Trinidad and Tobago **Estonia** Portugal Greece Israel **New-Zealand** **Singapore** **Hong Kong** Italy **Great Britain** **Australia** **Ireland** **USA**	Niger Mozambique Burkina Faso Senegal Mauritania Cameroon Guinea Pakistan Ghana India Egypt Morocco	Algeria Kazakhstan Tunisia Russia Croatia **Lithuania** **Slovakia** **Hungary** **Czech Republic** South-Korea **Slovenia** **Spain** **Sweden** **Belgium** **Finland** **France** **Germany** **Japan** **Holland** **Austria** **Canada** **Denmark** **Switzerland** **Norway**

Source: compiled by the authors.