UDC 339

On the Need for New Procedures for Analysing the Interrelationships between Social Inequalities, Human Capital and Economic Growth

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ABSTRACT. The paper presents conclusions from review of empirical researches within the theory of endogenic growth. They concern correlation between synthetic measures of economic growth, human capital and social inequality. Basing on critical analysis of the results a new research procedure of the correlation was proposed. It is based on disaggregation of inequality into groups of the frustrating and the activating ones. Basing on the own research results that used the new procedure there was indicated the necessity to search for the measures of inequalities that strengthen economic growth and economic effectiveness as well as the inequalities that decrease economic growth. The necessity to rebuild the statistical datas to measure social inequality was also stresse

KEYWORDS: social inequality, economic growth, human capital, endogenous growth theory

Introduction

The relatively weak interest being observed in Poland among politicians, opinion leaders and a large part of the civil society with respect to the uneven distribution of income, poverty and social exclusion is a phenomenon threatening the sustainability of economic growth, improved quality of life and the bridging of the development gap. The obserwations in this paper are devoted to this thesis. Since this claim conflicts with the line of thought popularized by mainstream economists, it is worthy of observation as to whether it is rational in the context of long-term determinants of the development processes.

The observed phenomenon of a decline in thought in terms of social justice should not necessarily imply the victory of reason over ideology. It is the outcome of progressive commercialization of all spheres of human existence, which is favoured by intense competition of a new order[1] based on the search for synergistic effects of technological, product, management, marketing, financial innovation and others, characteristic of globalized liberalisation and the information society. The criteria of choice of economic efficiency

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[1] Porter M., *Porter o konkurencji* (Warszawa: PWE, 2001).

IEP, № 16—17, (2012) c. 35—54

ISSN 1811-9832/2012/№ 1—2 (16—17)

and social justice has proven to be useful in political marketing and publications within the prevailing conditions of neoliberal ideology, the repudiation of the welfare state, social solidarity and stigm-?tization of *homo sovieticus* which was defeated in the political subordination to the criteria of economic effectiveness and social justice . The genuine cause of this process is indeed more complex. The collapse of social capital coupled with the clash of traditional values with market values, in the face of the failure of centrally planned economies and the questioning of the State's economic policy of Keynesian interventionism, have become of fundamental importance. This confrontation has, in Poland, led to the collapse of the ethos of social solidarity, weakening and dissolution of trade unions, the domination of business interests and the usurpation of the state by a political class with neoliberal ideologies. This ideology presuppossess that under efficient market mechanisms socio-economic inequalities are resolved, in practice, for the benefit of overall development of the society. Procedures that guarantee exercising the rights of free choice[1], especially respect for the fundamental human right to life, to products of one's labour and freedom of choice are deemed adequate. Institutional order based on ethical individualism that guarantees freedom from slavery is seen in this approach as the equitable solution to social inequalities.

It is true that income flows from the poor to the rich facilitates accumulation and economic modernisation, thus increasing the productivity of factors of production and GDP growth. This increase in the GDP is shared not only among those capable of productively engaging resources in their possession. The quality of life of citizens, products and services, availability of goods, increased diversity, opportunities for the productive involvement of people's productive capacity as well as increases in their resources are thereby improved. Property and income differentiation are, in this respect, econo-?ically reasonable costs of economic modernisation and general prosperity.

The preceeding argument ignores, however, the issue of silence over negative freedom that can become the source of varied exclu-?ions resulting from asymmetrically distributed limitations on the use of freedom, especially in emotional, cognitive and information aspects. To benefit from freedom, it is necessary to attain such levels of functioning that enables humans to become entities that are thoughtful, desirous, bear responsibility for their choices and capable of explaining the intended purpose thereof[2]. The question

[1] Nozick R., *Anarchy, State and Utopia (*New York: Basic Books, 1974).
[2] Sen A., *Nierywnoњci spoieczne. Dalsze* rozwaïania (Krakyw: Znak, 2000).

that arises is whether an institutional order in which the entity does not have the opportunity to be well nourished, healthy, exercise freedom of movement and can with impunity be deprived the respect of others as well as being denied its dignity, is still a guarantor of freedom of choice. In terms of Sen's theory of human functioning and capabilities not only does it not protect against unjust social inequalities but thus create grounds for waste of productive potentials inherent in human and social capital, which could have been utilized, after all, for the enhancement of the quality of life and economic competitiveness.

An overly simplified scheme of the neo-liberal perception of real processes, in the face of current global financial crisis along with its consequences, cannot withstand the test of time. Increasing polarization of incomes and threats to sustainable economic growth raises questions, relative to facts about the acknowledgment of the inter-relationships between social inequalities, especially those between wealth and incomes including their determining factors and economic growth. The author's observations resulting from his own pilot studies are herein presented.

The outlook based on the theory of economic growth

Endogenous growth models show that it is possible to promote egalitarian incomes through investments in human capital without compromising economic efficiency whilst less differentiation of earned incomes in the society support long-term economic devel-?pment. It can not be concluded, however, based on these models that the accumulation of human capital supports processes of limiting income inequalities between microeconomic entities.

The persistency of income inequalities between microeconomic entities have been suggested by endogenous growth models[1],[2],[3]. The key factors limiting income inequalities in these models are inves-?ments in human capital, provided they are accompanied by the kind of coincidences that result from the specificity of determinants of the developmental processes whether they are dependent or independent of the decisions of businesses and the State. In these models, attention is drawn to:

1. External effects arising from the accumulation of human capital, witnessed at family, neighborhood, local community levels

[1] Romer P., „Endogenous technological change," *Journal of Political Economy*, vol. 98 (1990): p. 71-102.
[2] Lucas R. E., „On the mechanics of economic development," *Journal of Monetary Economics*, no. 22 (1988).
[3] Glomm G., Ravikumar B., „Public versus private investment in human capital: endogenous growth and income inequality," *Journal of Political Economy*, vol. 100 (1992).

and in the economy as a whole[1]. These effects are the result of inter- and intra-generational dependences existing in microeconomic entities. As a result, microeconomic entities enrich their human capital through experiences handed down by their families as well as other members, including national and international community[2]. Entities of a differentiated, open and diverse family, national or international communities with the level of human capital lower than the average, accumulate productive factor faster than those with higher, relative to the average, levels. Consequently, incomes between entities become aligned on the path of sustainable growth. These models also indicate that economies with less disproportions in human capital and consequently attainable incomes are chara-?terized by higher rates of long-term growth than economies with higher disproportions.

2. Nature of types of education funding. sources Both Glomm and Ravikumar[3] in comparing sources of financing private and public education, argue that accumulation of human capital limits income disproportions both with diminishing marginal productivity of human capital which fulfills conditions for neo-classical growth as well as increasing marginal productivity of the productive factor, being the situation in endogenous growth. This notwithstanding, income disparities are narrowed when the education of citizens is publicly financed. Similar conclusions follow from studies by Benabou[4]; Fernandez and Rogerson[5].

3. Fertility and mortality of microeconomic entities[6],[7],[8]. The lower the level of human capital in a group of subjects with relation to the average for a given population, the higher their fertility. In the de la Croix and Doepke [2003] model, for example, income inequalities resulting from the varied rates of fertility between microeconomic individuals and their limitations between individuals

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[1] Tamura R., „Income convergence in an endogenous growth model," *Journal of Political Economy* 99:31 (1991): p. 523-540. Tamura R., „Human capital and economic development," Federal Reserve Bank of Atlanta, *Working Papers Series*, WP 2004-34 (December 2004).

[2] Tamura R., „Income convergence in an endogenous growth model," *Journal of Political Economy* 99:31 (1991): p. 523-540. Tamura R., „Human capital and economic development," Federal Reserve Bank of Atlanta, *Working Papers Series*, WP 2004-34 (December 2004).

[3] Glomm G., Ravikumar B., „Public versus private investment in human capital: endogenous growth and income inequality," *Journal of Political Economy*, vol. 100 (1992).

[4] Benabou R., „Heterogeneity, stratification, and growth: macroeconomic implication of community structure and school finance," *American Economic Review*, vol. 86 (1996).

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[6] Becker G. S., Murphy K. M., Tamura R., „Human capital, fertility, and economic growth," Journal of Political Economy 98: 5, part 2 (1990).

[7] Doepke M., „Accounting for fertility decline during the transition to growth," *Journal of Economic Growth*, no. 9 (2004).

[8] de la Croix D., Doepke M., „Inequality and growth: Why different fertility matters," *The American Economic Review* 93: 4 (2003).

in the area of human capital lead to reductions in fertility diffe-?entials in a society. Consequently, less inequality in the distribu - ion of human capital reduces differentiation in fertility rates thus leading to greater equality in the distribution of incomes between microeconomic entities.

4. Heterogeneity of decisions by microeconomic entities with respect to expenditures on education[1],[2]. The introduction of varied preferences related to education into the Glomm and Ravikumar[3] model by Cardak[4] has shown that investment on human capital reduces income disparities between workers in endogenous growth conditions much faster than in neoclassical situations.

Empirical studies are also seeking connections between economic growth and social inequalities through the use of human capital. It is, however, usually identified with the impact of economic growth on inequality and, inequality on economic growth. The ambiguity of conclusions reached even with extensive research remains puzzling. The verification of the hypothesis on the impact of economic growth on inequalities carried out on an extensive empirical material by Deininger and Squire[5], Chen and Ravallion[6], Easterly[7] as well as Dollar and Kraay[8] may serve as a good example. Studies of these authors indicate that periods of accelerated economic growth did not tally with changes in inequality. Based on these, Ferreira[9] concludes that accelerated economic growth generally favours the reduction of social inequalities. It should be emphasized that these dependencies were not observed among countries of central and eastern Europe.

In the case of studies aimed at ascertaining reversed dependences, i.e., the impact of inequality on economic growth, three extreme interpretations can be observed. Based on the regression estimated using the least squares method, Alesin and Rodrik[10] as well as Perotti have indicated a negative impact of inequality on the rate of

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[1] Cardak B.A., „Heterogeneous, preferences, education expenditures and income distribution," *The Economic Record* 75:228 (1999).

[2] Benabou R., „Tax and education policy in a heterogeneous-agent economy: What levels of redistribution maximize growth and efficiency?," *Econometrica* 70:2 (2002).

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[9] Ferreira H.G., Inequality and economic performence. A brief overview to theories of growth and distribution (2004), artykui przygotowany dla http://www.worldbank.org, stan na lipiec 2004r.

[10] Alesina A., Rodrik D., „Distributive policies and economic growth," *Quarterly Journal of Economics*, vol. 109 (1994): p. 465-490

economic growth. Alesin and Rodrik had, based on these same methods, reported that inequality reduces rate of economic growth in democratic countries while being neutral on growth in non-democratic countries.

Banerjee and Durfo[1] on the other hand, have drawn attention to the impact of research methods on the results obtained. In their opinion, the negative impact of inequality on growth was in most cases derived from the conclusions reached in those studies, which were based on method of least squares, while in other cases, the conclusions were limited to the confirmation of the positive impact of changes in inequality on the GDP growth rate.

Li and Zou[2] and Forbes[3], on the other hand, using the Generali - ed Method of Moments have indicated, among other things, a positive correlation between inequality and economic growth. Using a similar approach, Lopez[4] showed the existence of very weak correlation between inequality and economic growth. Reducing the Gini index by 1 % translates, in his findings, into a reduction in the rate of economic growth of 0.007 %[5].

Barro[6], however, noted the absence of any influence of inequality on economic growth. The author, while analyzing a large group of countries failed to confirm any influence of inequality on growth. He suggests, however, that inequalities do appear to promote growth in the group of poor countries while impeding it in rich countries.

How could results of empirical research be improved i.e., activating and frustrating types of inequality

The studies earlier cited suggest that focusing solely on the rational theory of reducing economies to an elegant, simple and easily understandable model remains incompatible with universal feelings of the importance of justice in human thought and action. It is important to note, in the context of these research results, the significance of the sense of justice in human activity that is often

[1] Banerjee A.V., Durfo E., „Inequality and growth: What can the data say?," *Working Paper* 7793, NBER (July 2000).

[2] Li H., Zou H., „Income inequality is not harmful for growth: theory and evidence," *Review of Development Economics* 2:3 (1998): p. 318-334

[3] Forbes K., „A reassessment of the relation between inequality and growth," *American Economic Review*, vol. 90 (2000): p. 869-897

[4] Lopez J.H., „Pro-poor-Pro-growth: Is there a trade off?," *Policy Research Working Paper*, *The World Bank*, no. 3378 (2004).

[5] Lopez J.H., Pro-poor growth: a review of what we know (and of what we don't) (2005). www.worldbank.org, June 2005 r.

[6] Barro R.J., „Inequality and growth in a panel of countries," *Journal of Economic Growth*, vol. 5 (2000).

omitted in mainstream economics. To visualize the importance of justice in human thought and actions and through it the expression «fuelling the economy» Akerlof — Nobel Laureate in economics, 2001 together with Schilerr [2010] drew attention to the animal instincts emphasized by Keynes but rather marginalized in the mainstream of modern economics. According to them, references to the sense of justice tend to be the main motivating factor in making decisions of economic nature and in the ability to work effectively in a team and are connected with the feeling of certainty. Meanwhile, contemporary economics is still dominated by ambivalent attitudes towards the sense of justice. This has been facilitated not only by the animal instinct described by Akerlof as reflected by corruption and acting in bad faith, money illusion, or tales arising from waves of optimism and pessimism. Also of equal importance, in my opinion, are tales arising from ethical individualism that diminish human nature to the individual whose choice is driven by quantifiable self-interests in market terms. One should, in these stories, seek faith in the creative power in excessively simplified models of economic theory based on modeled facts, problems in defining and measuring social inequality, poverty, social exclusion and even in seemingly easy to measure income and wealth inequ-?lities. Ethical relativism, in conjunction with the diversity of research results obtained, offers room for manipulation of economic theories to justify any kind of income and wealth inequality as being rational economically and equitable.

One of the reasons for the ambiguity of results of empirical studies on relationships between growth and inequalities is due to the widespread use of rather too synthetic measures of inequality, which is the Gini coefficient. These relationships could be better diagnosed and understood, if we were able to extract at least two groups of inequalities that are characterized with quantifiable effects on costs and incomes as well as supply and demand.

The first group of inequalities, known as activating would be those associated with active adaptation[1]. As a consequence, they should trigger social energy aimed at overcoming poverty and social exclusion, lead to focus on productive ventures, active adjustments to resolve economic problems of individuals and families.

The second group, on the other hand, are those referred to as frustrating-type inequalities, which could be related with increase in crime, diminished willingness to cooperate, popularity of learned helplessness syndrome, thus resulting in higher taxes, higher transactional costs, lower productivity of labour, lower economic growth as well as increase in demand.

[1] This problem was first mentioned in [Wo␣niak 2004] Wo␣niak.

It seems that one of the determinants of this division could be the scale and scope of these inequalities. Frustrating-type inequalities are, without doubt, related to lasting unemployment, crime, increased governmental spending and they concern the excluded, the poor and those living below the poverty line. This does not, however, exhaust the list of inequalities.

Unfortunately, official statistics are not adapted to this type of analysis. No indicators have, until now, been established that can be used to precisely define when and under what circumstances the observed inequalities could be classified into one of the groups mentioned.

The proposed approach to inequalities indicates the existence of the effects of costs and demand inequalities, which are dominant whenever they are frustrating in nature as well as the effects of incomes, supply and demand that is characteristic of activating-type inequalities. The resulting impact of these inequalities on changes in GDP levels ought to depend on the scale and scope of both types of inequalities and the resulting negative impact on frustrating-type inequalities as well as positive impact on activating-type inequalities of the multiplier effects of governmental demand and expenditure. The difference between both multiplier effects can be positive, negative or in exceptional cases give a sum that is of no impact on the size of GDP. It is understood that on the basis of synthetic indicators of social inequality their factual impact on economic growth measured in terms of GDP is difficult to determine. It therefore becomes more difficult to formulate useful recommendations for the State's responsibilities in the area of reducing social inequalities. It is the characteristic nature of both frustrating and activating-type inequalities and not the inequality itself that should influence the State's role in income distribution, the nature of fiscal and social policy, in particular the tools applied in these policies, procedures, mechanisms and institutions. It should be noted, that postulations sometimes formulated in economic publications, based on economic growth models that rely on synthetic measures of inequality, ought to be treated only as modeled facts with incidental value in practice.

The essential issue that remains, from the applied economics view-point, is finding suitable measures of frustrating and activating types of inequalities. This is not an easy task since the national statistical offices have been adapted to such needs. This does not mean that the issue should be left unattended. An approximate measure of activating-type inequality could be indicators illustrating differences in salary levels between the best and worst-paid earner. A good reflection of frustrating-type inequality on the other hand

could be the percentage of people benefitting from social spending, proportion of citizens living below the poverty level, and the level of long-term unemployment or indicators of social capital loss. However, one needs to be wary of the highly approximate nature of these indicators of frustrating and activating types of inequalities. Despite the infirmity of the proposed indicators of frustrating and activating types of inequalities, earlier study attempts gave results that suggest the need to continue research in this field[1]. In subsequent pilot studies, for OECD countries in 1994-2008, the ratio of the minimum wage to average wages and the ratio of levels of salaries characteristic for 9 and 1quantile of income were adopted as indicators of activating-type inequalities while for those for the frustrating-type inequalities indicators, the percentage of the labour force remaining unemployed for longer than 12 months, and the percentage of those in unemployment for between 6 and 12 months were adopted. Eight characteristics of human capital were utilized to depict the indirect impact of social inequality on economic growth[2]. The full set of variables used in the study and the results obtained, based on data from 1994-2008 for OECD countries, is contained in the appendix (see tables 1-6).

Based on the statistically significant coefficients of correlation between GDP growth rate and the aforementioned explanatory variables, it can be deduced that along with increasing GDP per capita, there is a decline in social inequality measured using the Gini synthetic indicators. Social inequality, as measured using the Gini coefficient, hindered the growth rate of GDP per capita in OECD countries. It was also observed that frustrating-type inequ-?lity declined as reflected in the percentage of the labour force remaining in unemployment for 6 months and longer.

1. Activating-type inequalities identified on the basis of increasing wage disparities led to increased rate of economic growth in OECD countries. The calculations, however, are not sufficiently strong evidence to confirm the hypothesis about the positive impact of activating type of inequality on the rate of economic growth.

2. The rate of long-term unemployment as a measure of the frustrating type of inequality increased the growth rate of GDP per capita. This outcome, which differs from the accepted hypothesis of

[1] Woџniak M.G., Jabiocski J., Nierywnoњci spoieczne i akumulacja kapitaiu ludzkiego a wzrost gospodarczy. Pryba empirycznej weryfikacji wspyizaleïnoњci na przykiadzie Polski, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie, nr 786 (2008): s. 43-67.

[2] To measure the level of education and of investment on education the following indicators were applied: expenditures (public and private) on education, measured as % of GDP; percentage of the workforce with basic education; percentage of workforce with secondary education; percentage of workforce with higher education. The quality of health and investment on health care were on the other hand measured in, amongst others: expenditures on Healthcare, expressed in % of GDP; life expectancy at time of birth; mortality rate among 1000 live births; number of doctors per 1000 inhabitants.

the negative impact of frustrating-type inequalities on economic growth, may be due to the heterogeneity of OECD group of countries, amongst which are countries with non-employment related economic growth.

3. There exists a distinctive positive correlation between education and economic growth, with the correlation of both variables much stronger in respect of the percentage of the workforce with higher education than with basic. No positive correlation was, however, observed between expenditures on health and GDP, although increasing growth of GDP per capita is associated with improving health standards as well as rising expenditures on health. Certainly, this is not unconnected with the several factors which influence, disproportionately though, the effects of increased costs of health service. As increasing GDP per capita is associated with declining rate of economic growth, it may also have, in this case, impacts on the convergence effect.

4. Increasing the proportion of the workforce with higher education, as well as increased expenditure on health care and improving health standards, which is reflected by prolonged life expectancy and lower infant mortality, increased the scale of income inequality measured by the Gini coefficient. These confl-?cting conclusions regarding the impact of human capital on inequalities in respect of decisions drawn from endogenous theories of economic growth have led to questions about the relevance of the averaged synthetic measure of inequality applied in this analysis. The question that arises, in the context of this result, is the non-adaptation of the quality of human capital to requirements of modern economies and improvement of the methods of measuring the productive resource as well as factors limiting social inequality in order to take into account its quali-?ative properties [1].

In turn, the results of estimations, in which explained variables were indicators of activating and frustrating types of inequalities, were found to be consistent with deductively derived potential dependences occurring between human capital and income dispa-?ities. In particular, it was found that:

1. Investments on education and health care increased activating-type inequalities while decreasing frustrating-type inequalities. Thus, increasing these expenditures widened the disparities of incomes but reduced the rate of long-term unemployment, as a frus-?ating type of inequality.

[1] For issues related to weaknesses of methods for measuring human capital see Wo┘niak M.G., Jabiocski (2006) pp. 25 - 55.

2. Growing proportion of the workforce with secondary and tertiary education increased activating type of inequalities while reducing frustrating-type inequalities.

3. Increasing proportion of the workforce with basic education reduced the activating-type inequalities while increasing the frustrating-type inequalities. This conclusion appears valid, given the fact that OECD countries covered by the study are techn-?logically advanced, which necessitates high demand for qualified workforce and differentiated salary levels due to differences in levels of education. Consequently, their economic growth and development greatly rely on the high qualifications and skills which employees with basic education do not possess.

4. Improving health standards, reflected in longer life expectancy and lower infant mortality reduces frustrating-type inequality while increasing activating-type inequality. This conclusion confirms, as should be expected, the desirability of extending the productive age limit.

Conclusions

Conducting debates on the relationships between social inequ-?lities, economic growth and quality devoid of individual interests and ideology is difficult due to emotional, informational and cognitive limitations, which are themselves products of research conventions and assumptions adopted to simplify various economic theories. A lot of the difficulties encountered in this field of economic studies are due to inherent weaknesses of theories of economic development. Growth models are based on a mechanistic approach, rather reductionist and are not duely adapted to take account of qualitative changes, both in terms of quality of life, integrated development, changes in human capital and its infra-?tructure (social, and structural capital including other components of intellectual capital) without which it is impossible to ensure their effective utilisation.

The problem of social inequality has not been resolved. Hence the issue of changes in perception of fair social inequalities remains outside the scope of researches on economic development theories. There exists a number of unresolved issues concerning the detailed measurement of variables in these models. For example, in respect of poverty, there are a lot of definitions of this category and consequently lack of precise measurements. There is dearth of information on the income of certain groups amongst the poor. This applies specifically to the homeless, the handicapped, people from dysfunctional families, resulting in the underestimation of this

variable. In contrast, in case of the wealthiest, there is a tendency to hide incomes, and refuse giving relevant information by members of this group. In addition, official statistics focus on wage distr-?bution while unearned incomes are difficult to grasp.

Traditional measurements are, in case of human capital, loosing in importance. While the issue of access to knowledge becomes less important in knowledge-based economy and information society, quality education, competence which motivates entrepreneural activity, pro-social attitudes, ability to select and process infor-?ation as well as its swift acquisition have become the most desired. Knowledge devoid of the possibility of its efficient utilization becomes an expense of economic development and source of frust-?ating type of social inequalities, which diminishes economic growth measured by GDP.

The desirability of in-depth research on the connections between social inequalities and economic growth is indisputable. A new approach to the measurement of social and capital inequalities aimed at taking cognisance of structural changes in these categories for economic growth could contribute to change of views on the issues of effective institutions, mechanisms, tools or procedures for regulating processes of income distribution and on the association of criteria of economic efficiency with those of equitable social inequality.

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The article was reseived by the editorial board on 18.01.2012

Table for the papers: «On the need for new procedures for analysing the interrelationships between social inequalities, human capital and economic growth»

Table 1. **Macroeconomic Variables, Their Symbols and the Source of Data**

Name of variable	Symbol	Source
GDP per capita at constant prices by PPP, USD, prices fixed since 2000.	GDP p.c.	OECD (2010)
Investment rate measured as %GDP	Inv	WDI (2010)
Average increase in consumer price in a year (excluding end of year)	Infl	OECD (2010)
Human capital – education		
Public and private expenditures on education, measured in % GDP	edu_exp	OECD (2010)*
Proportion of workforce with elementary education	LF_primar	WDI (2010)
Proportion of workforce with secondary education	LF_second	
Proportion of workforce with tertiary education	LF_tertiar	
Human capital – health		
Expenditure on healthcare, measured in % GDP	health_exp	OECD (2010)
life expectancy at time of birth	life_expect	
child mortality rate per 1000 live-births	Babies	
number of doctor per 1000 residents	physician	
Inequalities		
The Gini coefficient	Gini	Eurostat (2010)
Activating types of inequalities		
Minimum to average pay relationship	in_ak1	OECD (2010)
relationship in levels of remuneration 9 to 1 quantiles	in_ak2	
Frustrating types of inequalities		
Proportion of work force unemployed longer than 12 months	in_fr1	OECD (2010)**
Proportion of work force unemployed from 6 to 12 months	in_fr2	

*The value of the edu_exp measurable for OECD countries was calculated based on OECD [2010] data on public and private expenditure as a component of the global demand, as well as the GDP of countries surveyed.

**Values of In_fr1 and in_fr2 indicators were calculated on the basis of data published by the OECD (2010) on the number of unemployed persons from 6 to 12 months and over 12 months, the number of working age population (workforce).

Source: own calculations.

Table 2. **Correlation Coefficients Between the Rate of Growth and the Level of Gdp Per Capita, Including Selected Macroeconomic Variables for Oecd Countries**

Variable	GDP per capita rate of growth			GDP per capita		
	Correlation coefficient	Value *p*	Sample number	Correlation coefficient	Value *p*	Sample number
Inv	0,169	0,000	441	−0,189	0,000	471
Infl	−0,034	0,454	466	−0,404	0,000	496
GDP p.c.	−0,166	0,000	466	---	---	---
Indicators of human capital						
edu_exp	0,079	0,157	319	−0,103	0,062	319
LF_primar	−0,047	0,371	356	−0,238	0,000	364
LF_second	0,113	0,033	351	0,037	0,475	359
LF_tertiar	−0,099	0,059	356	0,455	0,000	364
health_exp	−0,250	0,000	413	0,504	0,000	442
life_expec	−0,224	0,000	416	0,678	0,000	446
Babies	−0,034	0,484	407	−0,535	0,000	437
Physician	−0,112	0,025	393	0,229	0,000	419
Indicators of social inequality						
Gini	0,020	0,771	208	−0,339	0,000	208
in_ak1	−0,014	0,806	297	0,249	0,000	316
in_ak2	0,165	0,010	238	−0,130	0,038	250
in_fr1	0,212	0,000	437	−0,410	0,000	464
in_fr2	0,161	0,000	437	−0,464	0,000	464

Legend: value *p* — Level of statistical significance student's t-distribution
Source: Calculations by Jukasz Jabiocski based on data source as presented in table 2.

Table 3. **The Results of Estimates of Regression for Gdp Per Capita Growth Rate for Oecd Countries**

Variable	Dependent variable: GDP per capita rate of growth								
Constant	0,025	0,019	0,036	0,057	0,031	0,057	-0,035	0,063	0,017
Value p	0,000	0,000	0,000	0,009	0,000	0,022	0,032	0,004	0,000
edu_exp	0,000								
Value p	0,048								
LF_primar		0,024							
Value p		0,102							
LF_tertiar			-0,040						
Value p			0,041						
health_exp				-0,003					
Value p				0,009					
Babies					-0,001				
Value p					0,114				
Gini						-0,001			
Value p						0,218			
in_akt1							0,171		
Value p							0,000		
in_ak2								-0,012	
Value p								0,079	
in_fr1									0,266
Value p									0,000
R^2	0,239	0,267	0,270	0,258	0,286	0,338	0,231	0,305	0,234
adjusted. R^2	0,160	0,200	0,203	0,200	0,230	0,260	0,173	0,234	0,178
Size of sample	321	358	358	415	409	210	299	240	439
No. of countries	30	30	30	30	30	22	21	22	30

Legend: value p — level of statistical significance student t-distribution.
Source: calculations bay Jukasz Jabiocski based on source data contained in table 1.

ISSN 1811-9832.INTERNATIONAL ECONOMIC POLICY.2012.№ 1—2 (16—17)

Table 4. **Results of the Estimates of the Regression for Indicators of Inequalities for OECD Countries**

Variable	Description of variable														
	Gini	Gini	Gini	Gini	in_ak1	in_ak1	in_ak1	in_ak2	in_ak2	in_ak2	in_ak2	in_ak2	in_ak2	in_ak2	in_ak2
Constant	26,94	24,34	−2,901	30,88	0,334	0,135	0,376	2,301	3,378	3,023	2,937	1,942	−5,371	3,698	2,122
Value p	0,000	0,000	0,770	0,000	0,000	0,224	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
edu_exp								15,22							
Value p								0,000							
LF_primar									−0,719						
Value p									0,000						
LF_second					0,051					0,400					
Value p					0,035					0,093					
LF_tertiar	7,695										1,014				
Value p	0,041										0,000				
health_exp		0,488										0,145			
Value p		0,009										0,000			
life_expec			0,401			0,002							0,110		
Value p			0,001			0,047							0,000		
Babies				−0,48			−0,002							−0,104	
Value p				0,001			0,002							0,000	
Physician															0,415
Value p															0,000
R^2	0,912	0,905	0,908	0,909	0,899	0,890	0,886	0,970	0,947	0,944	0,948	0,955	0,969	0,971	0,952
adjusted R^2	0,899	0,892	0,896	0,897	0,889	0,882	0,877	0,966	0,940	0,937	0,942	0,951	0,966	0,968	0,946
Size of sample	161	189	188	187	241	297	287	185	205	200	205	245	243	234	231
No of countries	21	22	22	22	21	21	21	22	22	22	22	22	22	22	22

Legend: value p — level of statistical significance student's t-distribution
Source: calculations by Jukasz Jabionski based on source data contained in table 2.

Table 5. **Results of Estimates of the Regression for Indicators of Inequalities for Oecd Countries**

Variable	Description of variable												
	in_fr1	in_fr1	in_fr1	in_fr1	in_fr1	in_fr1	in_fr2	in_fr2	in_fr2	in_fr2	in_fr2	in_fr2	in_fr2
Constant	0,021	0,045	0,068	0,270	0,026	0,070	0,010	0,016	0,015	0,028	0,133	0,010	0,027
Value p	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
LF_primar	0,025						0,009						
Value p	0,008						0,004						
LF_second								−0,007					
Value p								0,040					
LF_tertiar		−0,068							−0,012				
Value p		0,000							0,003				
health_exp			−0,005							−0,001			
Value p			0,000							0,000			
life_expec				−0,003							−0,001		
Value p				0,000							0,000		
babies					0,000							0,000	
Value p					0,220							0,000	
physician						−0,015							−0,005
Value p						0,000							0,000
R^2	0,781	0,794	0,766	0,769	0,742	0,782	0,766	0,762	0,766	0,742	0,766	0,724	0,791
adjusted R^2	0,761	0,775	0,749	0,752	0,723	0,764	0,744	0,740	0,745	0,723	0,749	0,703	0,774
Size of sample	359	359	432	436	427	410	359	354	359	432	436	427	410
No of countries	30	30	30	30	30	30	30	30	30	30	30	30	30

Legend: value p — level of statistical significance student's t-distribution
Source: calculations by Jukasz Jabiocski, based on source data contained in table 1.

Table 6. **Results of Estimating the Regression of Gdp Per Capita Growth Rate for Oecd Countries**

Variable	Dependent variable: GDP per capita rate of growth				
Constans	−0,091	0,276	−0,147	−0,046	−0,081
Value p	0,000	0,000	0,000	0,278	0,004
Inv	0,207	0,073	0,283	0,259	0,192
Value p	0,000	0,144	0,000	0,001	0,003
Infl		−0,088		−0,121	
Value p		0,000		0,000	
edu_exp			0,000	0,000	
Value p			0,203	0,014	
LF_primar					0,022
Value p					0,169
health_exp				−0,006	
Value p				0,012	
life_expec		−0,003			
Value p		0,001			
babies	−0,000				−0,001
Value p	0,071				0,055
in_akt1	0,223		0,313	0,204	0,195
Value p	0,000		0,000	0,001	0,000
in_fr2		−0,470			
Value p		0,097			
R^2	0,329	0,320	0,288	0,378	0,331
adjusted R^2	0,266	0,260	0,200	0,293	0,252
Size of sample	268	409	209	208	228
No of countries	21	30	21	21	21

Legend: value p — level of statistical significance student's t-distribution
Source: calculations by Jukasz Jabiocski based on source data contained in table 1.