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Tartu 2005

ISSN 1406–5967
ISBN 9985–4–0461–0
Tartu University Press
www.tyk.ee
Order No. 587

THE EFFECT OF MACRO-LEVEL SOCIAL CAPITAL ON SUSTAINABLE ECONOMIC DEVELOPMENT[1]

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Abstract

The concept of social capital as an important determinant of economic development is attracting increasing attention among development economists. The present paper analyses the impact of macro-level social capital on economic development in 34 European countries. Macro-level social capital comprises different aspects of institutional quality and is closely related to the income distribution and social cohesion. We used principal component analysis to group initially selected social determinants of economic development into three components (human and social capital, income equality, and redistribution), which altogether described 64.4% of the variation of the initial variables. Following regression analysis proved that all these components have a positive effect on economic development, measured by human development index.

Keywords: social capital, economic development, sustainability, European economies

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[1] This paper has been prepared with support of the ETF grant No. 5369.

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INTRODUCTION

The concept of economic development and its factors has changed over time. In general, economic development lies in the increase in welfare, measured as GDP per capita and its growth rate. Broader concept includes also social aspects of development – poverty reduction, better education and health, more equal income distribution. In the long run, economic development should be sustainable, which means that today's developments could not compromise the capacity of future generations to satisfy their needs. Traditional determinants of economic growth and development include physical and natural capital, technology and also human capital. However, the differences in the speed of economic development among countries with similar factor endowments and production technologies have called for introduction of new factors of economic development in the last decade of the 20th century. Since earlier theories did not take into account the relational and structural aspects of economic transactions, economists have recently focused on the contribution of social capital to economic growth and development.

Social capital refers to the trust, civic norms and networks that enable collective action and improve market performance by reducing transaction costs. The current paper focuses on the macro-level elements of social capital, which consist of institutional relations between people and are related to the institutional structure and functioning of society. The main reason for such restriction stems from the fact that micro-level social capital is quite stable over time and hard to change by any intentional policy. On the other hand, there is a complex relationship between micro- and macro-level social capitals. Formal institutions can be substitutes for – as well as causes

of – interpersonal trust and civic cooperation. Therefore, if we want to achieve better development outcomes by using social factors of development more effectively, we have to focus on these (institutional or macro-level) aspects of social capital which are easier (or at least possible) to influence.

The aim of the current paper is to study the impact of macro-level social capital and related social factors on economic development in 34 European countries, which are divided into three groups according to their development levels. Economic development is measured as GDP per capita (adjusted for purchasing power parity), annual average growth rate of GDP from 1990 to 2001, value of the human development index and adjusted net savings. Major focus is on human development as a broader development objective than simple economic growth. Macro-level social capital is approximated by the institutional environment. As the economic effects of macro-level social capital depend on social cohesion in a society, additional related factors of development – ethnolinguistic fractionalisation, income distribution and redistribution were included in the analysis. The data used in the empirical analysis refer to the year 2001 and are derived from three different databases (WDI 2002, HDI 2002, Kaufmann et al 2002) and from the article of Alesina et al (2002). From the methodological point of view, principal component analysis and regression analysis of panel data will be employed.

The structure of the paper is as follows. The first section discusses the concepts of sustainable economic development and social capital, analysing the importance of social factors in economic development on theoretical level. The main emphasis is on the causal mechanisms of how different elements of social capital could influence economic performance and outcomes. Also, the overview of related empirical literature is given. Theoretical part of the paper is followed by empirical analysis, the aim of which is to assess the impact of macro-level social capital and related social factors on economic development. The second section presents descriptive statistics of individual countries and group averages, and analyses also the correlations between individual

variables. In the third section, principal component analysis is implemented in order to generalise the wide set of social factors of development. Obtained component scores are further used to compare the relative importance of various components in different countries. In the fourth section, principal component analysis is followed by regression analysis in order to relate the attained components with different development indicators. The results of regression analysis are subsequently used for estimating the potential for social development (measured as the difference between predicted and actual value of human development index) in the new EU member states.

1. THEORETICAL BACKGROUND

1.1. Dimensions of economic development

Economic development is the most important goal of almost all economies – not so much as an end in itself, but rather as a means of achieving the increase in welfare. The latter is realised if the wealth of a nation increases, and that, in turn, is usually triggered by economic growth. The wealth of nations is usually measured by GDP per capita, adjusted for purchasing power parity (PPP). But this measure is not good enough, if we are attempting to assess and compare the real development levels of different economies. As an alternative, the Human Development Index (HDI) is often used to compare the development levels of different countries. The HDI includes sub-indices of GDP, life expectancy and education, covering therefore also the human (capital) aspect of the development. But even this measure remains too one-sided, if we want to cover broader understanding of the concept of development. As understood today, development refers to the expansion of freedom and choices of individuals and of the society. This process depends not only on durable growth of economic indices, but also on health as well as other social and cultural indices (Sen 1999). Here we arrive at the concept of sustainable development. According to the definition

of the Commission on Sustainable Development, the economic development of a country is sustainable if it fulfils the present needs of the society, but does not diminish the future generations' opportunities to fulfil their needs (WCED 1987: 43). Alternative approaches suggest that development is sustainable if the society's welfare is not decreasing over time and the people's choices persist or expand.

In practice, sustainability is usually measured through sustainable usage of natural environment. In addition to natural capital, the society should also supply future generations with a sufficient amount of human and social capital. For a joint assessment of the impact of human and natural capital, the World Bank suggests to use the index of adjusted net savings. This measure is derived from GDP by subtracting the consumption and net amortization of physical and natural capital, and then adding net investments into human capital (WDI 2001). But adjusted net savings, too, do not include social capital (which, in fact, becomes an increasingly important factor of development as the society moves to higher welfare levels). However, the World Bank has currently developed the term "responsible growth" which, in addition to sustainable development defined earlier, includes also social equity and inclusion (The World Bank 2004). As such, it can be concluded that the society is developing in a sustainable way when the amount of generated wealth by all forms of capital is preserved or increased.

Let us hereby return to what was said at the beginning of the section – sustainable economic development and economic growth as narrower development objectives are closely related, and without growth there would be no development. According to the convergence theory, developing countries should have higher growth rates compared to developed countries in order to catch up the latter. Nevertheless, the results of empirical investigations do not prove always this logic of globalisation processes. On the other hand, if economic growth is the most important goal of the society, social aspects of development remain inevitably on the background. The next subsection

discusses shortly the importance, effects and interrelationships of social or "soft" determinants of economic growth and development – human and social capital, redistribution and social cohesion. A general framework for this analysis is presented in the following figure.

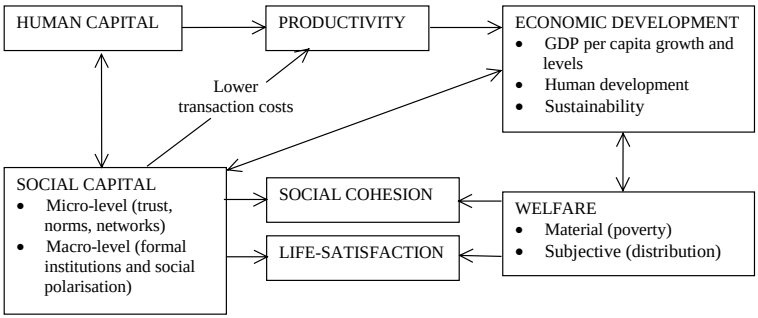

Figure 1. Social aspects and factors of economic development (compiled by the authors).

The authors recognize that the relationships presented at Figure 1 are not complete – one can add more complicated interdependencies and additional (external) factors, like technological progress, historical experience, and others. However, we restrict ourselves consciously in order to stay more focused on our primarily research task – the social factors and outcomes of economic development.

1.2. Social and institutional factors of economic development

1.2.1. Human capital and the need for redistribution

In addition to traditional growth determinants like physical capital and technology, another very well known and analysed factor of a society's overall development is human capital[4] – both its quality and quantity. Romer (1986) and Lucas (1988) added human capital into endogenous growth models and following empirical work has proved that human capital has a strong explanatory power in growth regressions. However, creating human capital costs much. Investments into human capital through health and education expenditures will result in decreased current consumption levels. People with low income are often not able to invest enough into human capital and their choices of further life path are therefore restricted. To some extent, income inequality is unavoidable, as people have different abilities when entering the society's life. It is known that, theoretically, redistribution of a society's resources is inefficient from the viewpoint of growth perspectives (at least in the short run). On the other hand, redistribution of a society's resources would diminish income inequality and therefore increase social cohesion, which, as discussed later, is usually beneficial for economic development. The state should therefore implement redistribution policies in order to avoid too steep inequalities and to provide all people with access to the services that are needed for creating, maintaining and improving human capital, such as education and health care.

Besides human capital, social and institutional resources are also important for ensuring the economic growth and sustainability of the development process. This issue was lastly raised in 1990s in the context of the conditional convergence theory – it was

[4] Human capital is understood here in its broadest sense, including people's health, knowledge, skills, and experience, making them economically productive.

acknowledged that there are various structural impediments to growth and development, like incomplete property rights, transaction costs, ineffective government policies, income inequality, weak legal and business institutions, capital market imperfections and cultural differences (Yeager 1999). Most of these development obstacles represent (or are the result of) the lack of social capital.

1.2.2. Micro-level social capital

The relations between social capital and economic development are complicated, partly because of the vagueness and complexity of the first concept. There are different approaches to defining, measuring and applying the concept.[5] In general, social capital includes networks together with shared norms, values and understanding that facilitate co-operation within or among groups (OECD 2001: 41). Social capital formation and effects could be analysed at different levels: micro-level (interpersonal trust and informal relations between individuals), meso-level (community of identity) and macro-level (regional, national, international networks and institutions). Most of the empirical work at the micro-level has proved that both trust and civic cooperation are associated with stronger economic performance (Putnam 1993, Fukuyama 1995, Helliwell and Putnam 1995, Knack and Keefer 1997, Hjerppe 2000, Zak and Knack 1998, La Porta et al 1997), while the effects of associational activity are more ambiguous. The positive effects of a group membership appear mainly at the regional level (Putnam 1993, Beugelsdijk and Schaik 2005), while cross-country analyses usually do not show any correlation between participation and economic performance (Helliwell 1996, Knack and Keefer 1997). However, Raiser et al (2001) have found that unlike in market economies, generalised trust in transition countries is

[5] For alternative definitions of social capital, their comparisons and critics see, for example, Bourdieu (1985), Coleman (1990), Putnam (1993, 2000), Portes (1998), Fine (2001).

not positively related to growth, while participation in civic organisations shows a positive correlation. Also, participation is directly related to life satisfaction at individual level (Arts and Halman 2004; see also Figure 1), but this aspect of economic development remains outside the scope of the current study.

What are the causal mechanisms behind the expected positive relationship between micro-level social capital and economic performance? It has been argued that social capital complements the market in its allocative and distributive functions, thus helping to reduce transaction costs. According to Putnam (2000), the social networks generated through participation in local associations, voluntary organisations and groups open up channels for the flow of philanthropy and altruism, which, in turn, foster norms of individual and general reciprocity. This way, social capital facilitates economic exchange by reducing transaction costs, as fewer resources are wasted for formal contracts and monitoring. Besides lower transaction costs, social capital also reduces information costs and risk, and helps to avoid moral hazard and adverse selection (Meier 2002). Trust and norms can provide an implicit understanding that discourages opportunistic behaviour, effectively filling the gaps in incomplete contracts and thereby supporting valuable specialised investments (Lyon 2005). On the other hand, the efficiency of markets itself may undermine the existence of social networks in the long run. If the path of development is supported by a solid court system and contract enforcement, then large anonymous markets can be more efficient than informal networks, with gains for all participating economic agents (Grootaert 1998).

1.2.3. Macro-level social capital

In the current paper, the authors focus on the macro-level analysis, as this type of social capital seems to have the highest explanatory value when comparing the economic performance of the new EU members and associated states from Central and Eastern Europe. Macro-level social capital refers to the govern-

mental institutions that influence people's ability to cooperate for mutual benefit (Knack 1999). This broader approach to social capital relies on the work of Olson (1982) and North (1990). In more detail, governmental social capital embodies the rule of law, contract enforcement, the absence of corruption, transparency in decision-making, an efficient administrative system, a reliable legal system – in short, state capability and credibility (Meier 2002). In the post-communist countries of Central and Eastern Europe, where micro-level social capital is low and likely hard to change in the short run,[6] formal institutions can be both substitutes for – as well as causes of – social trust and civic cooperation. In broader context, the effectiveness of government performance depends on social cohesion, which in turn has its roots in ethnolinquistic fractionalisation of the society[7] and unequal income distribution (Rupasingha 2002).

There is a complex relationship between micro- and macro-level social capitals. Besides the micro-economic impact channels described above, civil social capital can influence economic performance also through macro-political channels (Knack 1999). Empirical evidence shows that micro-level social capital can strengthen democratic governance (Almond and Verba 1963), increase the efficiency and honesty of public administration (Putnam 1993, Knack 2002), and improve the quality of economic policies (Easterly and Levine 1997). Presupposing that macro-channels are important for realising the positive effects of civil social capital, we are subsequently going to analyse the relationships between economic development, formal institutions, social polarisation, and income distribution. These issues have been of interest both in the regional and cross-country develop-

[6] Several studies imply that micro-level social capital is mostly determined by external factors – such as cultural traditions, history (including communist past), and so on – which are persistent over time and hard to change (Banfield 1958; Putnam 1993, 2000; Rice and Feldman 1997).

[7] Ethnolinguistic fractionalisation includes ethnic, linguistic and religious diversity of the society (Alesina et al 2002).

ment literature. Most of the studies are focusing on the direct estimation of the impact of specific components of macro-level social capital on economic development (i.e. per capita GDP growth and investment rates), using simple correlation and regression analysis as a research method. Earlier cross-country studies approximated governmental social capital by Gastil's civil liberties indices (Gastil 1990), showing that civil liberties are positively associated with per capita income growth (Kormendi and Meguire 1985, Grier and Tullock 1989, Scully 1988). Concerning the causality issues, Kormendi and Meguire (1985) found that civil liberties influence economic growth almost entirely through investment rates, while Bilson (1982) argued that economic performance determines freedoms, rather than the other way around. Helliwell (1994) and Barro (1996) found that Gastil indices were positively related to growth only if variables like educational attainment and investment rates are omitted as explanatory variables, implying that any beneficial impacts of democracy on growth may operate through these factor accumulation channels.

However, the criteria used for constructing Gastil indices were primarily political rather than economic in nature, and later these were supplemented and/or replaced by several other indicators of institutional environment.[8] For instance, World Bank introduced the credibility index as a measure of social capital that was positively related to a higher level of economic growth and investment (World Bank 1997). Empirical study by Rodrik (1997) showed that an index of institutional quality explains well the ranking among East Asian countries by their growth

[8] These alternative indicators of macro-level social capital were mostly based on subjective political risk ratings, such as Business International (BI), International Country Risk Guide (ICRG), and Business Environment Risk Intelligence (BERI). However, these measures have been criticised for representing conditions facing actual foreign investors rather than conditions confronting domestic investors. Given the crucial importance of foreign technology and capital for successful catch-up growth in poor countries, conditions facing would-be foreign investors are also important. (Knack 1999)

performance. Several studies have found that subjective political risk ratings have a strong explanatory power for growth and private investment (Knack and Keefer 1995, 1997; Mauro 1995). Kaufmann and Kraay (2002) measured quality of governance by six composite indicators and found that it correlates strongly and positively with per capita incomes across countries. Many authors also acknowledged and tested (with varied results) the potential for reverse causality from economic performance to institutional quality (Knack and Keefer 1995, Chong and Calderon 1997, Mauro 1995). Summing up, all of these studies point to a significant and positive relationship between good governance and growth, with strong indications that the former causes the latter.

Further, several studies have focused on ethnic divisions and inequality as sources of slower growth through their impacts on trust, social cohesion, and economic policymaking. Most of these studies posit macro-political channels by which polarisation worsens economic performance. (Knack 1999) For example, Alesina and Perotti (1996) have found that income inequality as an instrument for political instability lowers investment rates and therefore also economic growth. The work of Rodrik (1998) and Easterly (1999) has shown that economic growth in general, and the ability to manage shocks in particular, is the twin product of coherent public institutions and societies' ability to generate the so-called "middle-class consensus"; the latter one defined as a higher share of income for the middle class and a low degree of ethnic polarisation. Knack (1999) has found a positive correlation between income equality and trust at the cross-country level. He has also indicated that inequality has strong direct effects on government performance (Knack 2002) and economic growth (Knack and Keefer 1997). On the other hand, the formation of social capital itself is related to distribution of wealth. If income distribution is unfairly unequal, some people will be marginalised and driven away from the society's life, which results in decreasing social cohesion. Ritzen, Easterly, and Woolcook (2000) have also argued that key development outcomes are more likely to be

associated with countries that are both socially cohesive and governed by effective public institutions. Social cohesion is essential for generating the trust needed to implement reforms – citizens have to trust that the short-term losses that inevitably arise from reform will be more than offset by long-term gains.

Besides income inequality, low social cohesion could also result from the society's polarisation along ethnic, racial or linguistic lines. Several authors have found significant correlations between the ethnolinguistic fractionalisation and socio-economic indices like long-run growth and quality of governance (Alesina et al 2002, 2004; Easterly and Levine 1997; Mauro 1995; Collier 2000). Economic motivations underlying the relationship between ethnic diversity and economic performance are discussed in detail by Alesina and Ferrara (2004), and Easterly and Levine (1997). Most importantly, ethnic divisions increase polarisation of preferences for public goods, impeding agreement over their provision and encouraging rent-seeking activities. However, there is no clear answer to the question whether (and how) the negative effects of ethnic fractionalisation on growth depend on the level of income or other features of the society. Alesina and Ferrara (2004) have suggested that under reasonable technological conditions, fractionalisation may have a positive (or less negative) effect on output at the higher level of development. Collier (1998, 2000) has shown that ethnic heterogeneity impedes growth significantly sharper in nations with fewer political freedoms, indicating that democracies manage to cope better with ethnic diversity. Finally, there is some evidence that polarisation together with formal institutions influence growth rates in part through their impact on trust. For example, Zak and Knack (1998) have demonstrated that income and land inequality, discrimination and corruption are associated with significantly lower growth rates, but the connexion of these variables to growth weakens when trust is taken into account.

2. DATA AND COMPARISONS

In the current study, the analysis of effects of social factors on economic development is based on macroeconomic panel data of European Union member countries and transition countries from Central and Eastern Europe. Majority of the data are taken from or based on the WDI and HDI databases (WDI 2002, HDI 2002) and refer to the year 2001. In case of no information for year 2001, the latest available data are used. Indicators of quality of governance and civic engagement originate from the database of Kaufmann et al (2002), and the measures of ethnolinguistic fractionalisation from Alesina et al (2002).

Altogether the initial analysis covered 34 European countries,[9] which were divided into three groups on the basis of their development level, as indicated by the HDI value. The countries in Group 1 are the founders of the EU and the member states in Scandinavia (11 countries, HDI rank 3–18), Group 2 includes Italy, Spain, Portugal, Greece and the countries that joined the EU in 2004 (13 countries, HDI rank 19–50). Group 3 consists of other transition economies (10 countries, HDI rank 53–108).

Despite of clear logic behind the formation of the country groups, it appears that the differences in the development levels of the countries belonging into different groups were often marginal (see Figure 2). Germany, for example, belongs into Group 1 and Spain into Group 2, although their HDI ranks differ only by one position and HDI values by 0.003 units.

[9] However, some countries (Armenia, Croatia, Czech Republic, Luxembourg, Macedonia, Moldova, Russia and Ukraine) are later excluded from the component and regression analysis due to the gaps in the data, and final analysis covers only 26 countries. The list of the countries included in the final analysis is presented in Appendix 3.

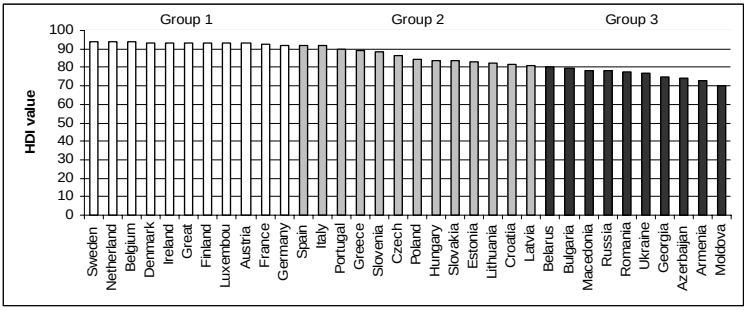

Figure 2. The pre-defined country groups according to their HDI values.

In order to verify whether these pre-defined groups differ on the basis of tendencies in the larger set of individual variables, a discriminant analysis was performed. Two discriminant functions constructed to distinguish separate country groups: pooled intra-group correlations between discriminating variables and standardised canonical discriminant functions. Descriptions of these functions can be found in Appendix 1. The individual variables are ranked in order of absolute size of correlation within a function, and subsequently, only the largest absolute correlation between each variable and any discriminant function is presented. The first discriminant function generalises the indicators of social capital and income distribution, and it describes 88.5% of the total variation of individual measures. The second function generalises the taxation indicators and describes 11.5% of the total variation.

According to the results of discriminant analysis, all countries appeared to belong to their pre-defined groups, although in some cases (i.e. Spain, France) there was a fairly high probability (ca 30%) of appearing in the higher or lower group. Additionally, Figure 3 proves that the dispersion of individual objects around mean values of the groups is relatively high. Still, we can observe the regularity that the grouping of objects on the basis of social capital indicators is relatively consistent with theoretical assumptions. It also appears that the tax system in Group 2 is different

from that of Groups 1 and 3, whereas the tax systems in the country groups of the lowest and highest development levels are quite similar. This could be interpreted as a relative success of more radical tax reforms in the new EU members, compared to the other transition countries in Europe.

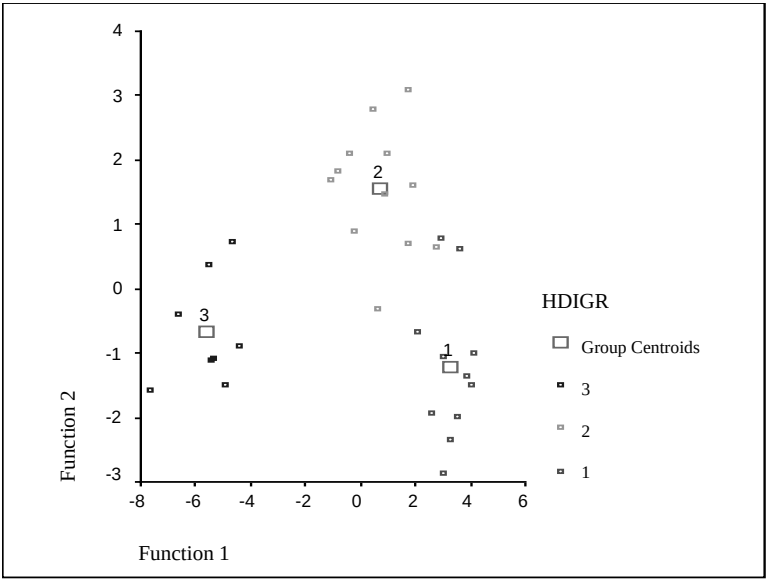

Figure 3. Canonical discriminant functions.

Next, Tables 1–4 illustrate the mean values and standard deviations of different indicators by the country groups, as compared to the average of the whole sample. Table 1 presents the mean values of the economic development indicators. In the current study, traditional measures of economic development include GDP per capita (adjusted for purchasing power parity) and human development index, while sustainability is approximated by adjusted net savings. It can be observed that the indices of economic development tend to change synchronically, and the country groups differ notably from each other. However,

this is not surprising as the country groups were formed on the basis of the general welfare indicator (HDI rank).

Table 1. Indicators of economic development levels

	GDP per capita PPP (GDPPCPPP)		HDI value (HDI)		Adjusted Net Savings* (ADNETSAV)	
	Mean	Std. deviation	Mean	Std. deviation	Mean	Std. deviation
Group 1	28795	8670	0.931	0.005	15.5	5.1
Group 2	13965	5216	0.859	0.038	12.8	4.2
Group 3	4835	2113	0.762	0.032	…	…
Sample	16078	11307	0.854	0.073	14.1	4.7

* Data for adjusted net savings were available only for 23 countries.

Table 2 presents the average values of economic growth and human capital indicators. Economic growth is measured by GDP per capita annual growth rate 1990–2001. Human capital formation is described as health expenditure per capita and public education expenditure per capita (both adjusted for purchasing power parity).

Table 2. Indicators of economic growth and human capital formation

	GDP per capita annual growth, 1990–2001 (GDPPCAA)		Health expenditure per capita (HEPCPPP)		Public education expenditure per capita (PUBEDPC)	
	Mean	Std. deviation	Mean	Std. deviation	Mean	Std. deviation
Group 1	101.6	1.47	2239	410	3102	1079
Group 2	101.9	1.65	1049	494	1821	503
Group 3	97.1	3.0	228	133	640	348
Sample	100.6	3.17	1169	899	1890	1217

As can be observed in Table 2, in 1990s the growth rates in the less developed European countries were not significantly higher than in the highly developed ones. Quite to the contrary – the countries of Group 3 had not reached the development level of 1990 even eleven years later. Short-run growth rates in year 2001 were consistent with theoretical presumption that poorer countries have a faster growth rate than rich countries. Corresponding average growth rates were 101.6% in Group 1, 103.6% in the Group 2 and 105.6% in Group 3. Still, in some countries of Group 3 the growth rate was negative. It can therefore be concluded that although countries with different development levels tend to converge, this process is not fast enough to guarantee the conforming development levels in the short term.

Slow convergence is partly related to the fact that poorer countries have not enough means to invest into human capital. Table 2 shows that health expenditures in Group 2 are less than half of those in Group 1, and in Group 3 almost ten times less than in Group 1. Differences in public education expenditures are also significant, although not so drastic. However, it should be noted that the picture might change when private education expenditures are considered – people in richer countries have broader possibilities to acquire an education for pay.

In the current study, macro-level social capital is approximated by quality of governance, ethnolinguistic fractionalisation, income distribution and redistribution. Quality of governance is measured by the six variables defined and calculated by Kaufmann and Kraay (2002).[10] The values of these variables are based on a scale –2.5 to +2.5, where higher values refer to better outcomes. "Voice and Accountability" includes indicators of various aspects of political process, civil liberties, political rights,

[10] These variables are more comprehensive than simplistic civil freedom and political risk indices used in most previous studies, described in section 1.2.3. For methodological details and updated indicators, see World Bank (2005) [http://www.worldbank.org/wbi/governance/govdata/].

independence of media etc. This variable measures the extent to which people are able to participate in the selection process of government and monitor the activity of those in power. "Political Stability" combines indicators measuring the probability that the current government will lose its power, will be destabilised or overthrown. "Government Effectiveness" reveals the quality of public services, extent of bureaucracy, the competence of civil servants, the independence of civil service from political pressure etc. "Regulatory Quality" includes indicators of price control, supervising inadequate banking and other market-unfriendly political activities. "Rule of Law" combines indicators measuring the society's success in developing an environment in which fair and clear rules form the basis for economic and social interactions. "Control of Corruption" includes various measures of perception of corruption. Since the initial values of these variables are given as deviations from the mean value of the sample, they have simply been summarised as a single measure of quality of governance. A higher value of the quality of governance index means a better situation in this respect. Table 3 shows that there is a clear positive relationship between a country's development level and the quality of governance. However, little is known about the causality and direction of this relationship – it could be expected that higher quality of governance leads to better development outcomes, but on the other hand, a higher development level may be needed in order to improve the performance of formal state institutions.

Table 3. Indicators of governance and ethnolinguistic fractionalisation

	Quality of governance (QUAGOV)		Ethnolinguistic fractionalisation (ELFRAC)	
	Mean	Std. deviation	Mean	Std. deviation
Group 1	8.40	1.42	21.4	10.0
Group 2	3.72	1.92	27.7	16.9
Group 3	–2.56	1.63	40.2	13.7
Sample	3.38	4.68	29.3	15.6

Ethnolinguistic fractionalisation (ELFRAC) includes ethnic, linguistic and religious diversity of the society. First, the sub-indices for each type of fractionalisation were calculated as Herfindahl's indices (Alesina et al 2002):

$$(1) \qquad ELFRAC = 1 - \sum_i s_i^2 ,$$

where s_i is the share of group i over the total of the population. These indices measure the probability that two randomly drawn individuals from a unit of observation (a country) belong to two different groups. For greater comprehensiveness, fractionalisation indices in Table 3 are calculated as geometric means of the three sub-indices. A higher value refers to higher ethnolinguistic fractionalisation and therefore to a lower level of social capital.[11] This result is consistent with the previous statement that highly developed countries have more social capital than less developed ones. Ethnolinguistic fractionalisation is the lowest in Portugal, which means that Portugal is the most uniform country in terms of ethnic, linguistic or religious differences. Latvia's ethno-linguistic fractionalisation is among the highest, referring to the fact that there are two groups of people (Latvians and Russians), different in ethnic, linguistic and religious aspects.

In order to analyse income inequality, theGini index was used first. Unfortunately, it was not possible to find the Gini indices for all of the countries in the same reference year. For the highly developed countries, for example, these indices are available only for the middle of the 1990s. On the other hand, it is known that income distribution in developed countries has been relatively

[11] The impact of ethnic diversity on social and economic outcomes often turns out to be nonlinear: polarisation can be at maximum when there is a small number of groups of roughly equal size (Horowitz 1985), while in case of many small groups no one will normally have an incentive or opportunity to impose its will on all others (Knack 1999). Despite of this it has been argued that fractionalisation indices like ELFRAC work better as determinants of economic outcomes, compared to other alternatives (for details, see Alesina and Ferrara 2004).

stable across the years. The redistribution of income can be assessed by the size of government, which is approximated here by the general government final consumption expenditure (see Table 4).

Table 4. Indicators of income distribution and redistribution

	Gini index (GINI)		General government final consumption expenditure, % of GDP (GGOVFC)	
	Mean	Std. deviation	Mean	Std. deviation
Group 1	30.6	5.00	20.5	3.75
Group 2	31.8	4.84	18.6	3.89
Group 3	34.5	5.50	14.6	4.89
Sample	32.2	5.17	18.0	4.33

As seen in Table 4, a higher development level correlates both with equality in income distribution and a higher share of public consumption. It is therefore not proven that more equal income distribution and a higher share of public consumption hinder economic growth and development.

In order to demonstrate the tendencies described in Tables 1–4 more clearly and to prepare further analysis, a correlation analysis was performed for individual variables. The correlation coefficients and their significances are presented in Appendix 2. In general, it can be concluded that the relations between individual variables are consistent with the theoretical hypothesis. Concerning the relations between the selected development indicators, it appeares that GDP per capita and the HDI values are strongly correlating with each other (which is predictable as GDP per capita is part of the HDI index) and also with other social development variables. The third development indicator, adjusted net savings, correlates significantly and positively with GDP per capita, but not with the HDI. Obviously, this measure of

sustainability describes different aspects of economic development and therefore complements traditional development indicators. Also, sustainable savings are significantly and negatively related to the Gini index. This result contradicts the theoretical assumption that higher income inequality encourages savings and investments. Surprisingly, the Gini index does not correlate significantly with any other development indicator.

Another interesting result is that general government final consumption expenditure is more strongly related to the human development level (HDI) than wealth (GDP per capita), confirming the importance of public consumption with respect to the actual development level. Also, general government final consumption expenditure correlates significantly and positively with health and education expenditures and total tax revenue, but not with the other indicators of tax system. Ambiguous correlation results assert that it is not reasonable to look for relations between tax system and tax revenue, public expenditures or development indicators, as tax systems in different countries are not similar.

Further, all six individual indicators of the quality of governance are positively connected to the GDP per capita and HDI values. However, the relations with general government final consumption expenditure appear to be weak or insignificant, although there is a reliable correlation between government expenditure and the generalised measure of quality of governance. Ethnolinguistic fractionalisation correlates statistically significantly with all the other factors of development except the general government final consumption, the adjusted net savings and the Gini index.

3. RESULTS OF THE PRINCIPAL COMPONENT ANALYSIS

In order to analyse and generalise the set of individual social and institutional development indicators, a component analysis was implemented. For a better coverage of macro-level social capital indicators and their possible impact channels, the initial set of independent variables (presented in Tables 2–4) was extended to include (a) alternative inequality measures, (b) separate components of ethnolinguistic fractionalisation, and (c) more detailed information about government expenditures and taxes. The extended list of the variables is presented in Table 5. While using the method of principal components, three main components were distinguished which altogether explained 64.4% of total variation of the individual variables. The component matrix was rotated based on the varimax method with the Kaiser normalisation and the results are presented in Table 5.

The first component describes 32.5% of total variation of the individual variables and is closely related to the human capital formation and basic macro-level social capital measures. The second component can be labelled as income equality and it describes 19.9% of total variation. The third component describes 12.0% of total variation of the individual variables, but its nature is difficult to explain. As the variables in this component are mostly related to taxation, the authors labelled it redistribution. A bit surprisingly, the third component includes also the indicator of the society's religious diversification. Anyway, this result should not be accidental, as the majority of the population should support a tax (or any other) system in a democratic society.

Table 5. Rotated Component Matrix

Variable (abbreviation)	Human and social capital (F1)	Income equality (F2)	Redistri-bution (F3)
Public education expenditure per capita, PPP, ln (LNPUBEDPC)	0.897		
Quality of governance (QUAGOV)	0.878		
Public health expenditure per capita, PPP, ln (LNHEPCPP)	0.868		
GDP per capita annual growth (GDPPCAA)	0.853		
Public health expenditure per capita, PPP (HEPCPPP)	0.789		0.379
Tax revenue, % of GDP (TAXGDP)	0.694		0.436
Taxes on income, profits and capital gains, % of current revenue (TAXINPC)	0.690		
Ethno-linquistic fractionalisation, mean (ELFRAC)	–0.675		
General government final consumption expenditure, % of GDP (GGOVFC)	0.531	0.383	
Income share held by highest 10% (RICH19)		–0.889	
Income share held by highest 20% (RICH20)		–0.884	
GINI index (GINI)		–0.867	
Women in government at ministry level, % of total (WOMGOV)	0.488	0.646	
Education expenditure, % of GNI (EDEXGNI)	0.464	0.552	
Public spending on education, total, % of GDP (PUBEDGNP)		0.492	

Variable (abbreviation)	Human and social capital (F1)	Income equality (F2)	Redistribution (F3)
Social security taxes, % of current revenue (SOCTAX)			0.916
Taxes on goods and services, % of current revenue (TAXGS)	–0.398		–0.797
Religious fractionalisation (FRACREL)	–0.467		0.553

* Columns of the table 5 present correlation coefficients of an individual variable and the component. All coefficients are statistically significant at a level of 0.1 or higher.

Values of the component scores for each country are presented in Appendix 3 and Figures 5–7, and the average values of country groups are shown in Figure 4. Component score 0.0 means that the object is at the average level of the sample. Numbers indicate the positive or negative difference between the actual and the average value, measured by standard deviation. For example, the value of the first component's component score is 0.688 in Portugal and –0.317 in Estonia. This means that the level of human and social capital is relatively higher in Portugal than in Estonia. Spain's figure 0.126 is closer to the average component score.

As the component scores are expected to play an important role in economic development, it is possible to interpret them as general indications of development. From Figure 4 we can see that all component scores are positive (above average) in the highly developed countries and negative (below average) in the other country groups. Component scores of F_1 differ remarkably across the country groups, being close to the average in Group 2 and deviating strongly into negative direction in the less developed European countries. As assumed on the theoretical basis, there is no clear relation between the second component of income equality and the level of economic development. Deviations of the scores are relatively small and they suggest that the

worst situation is in the countries of Group 2. The analysis also proves the hypothesis that income distribution tends to become more unequal as development speeds up. At the same time we can observe that when development process moves on, the income distribution should equalise again.

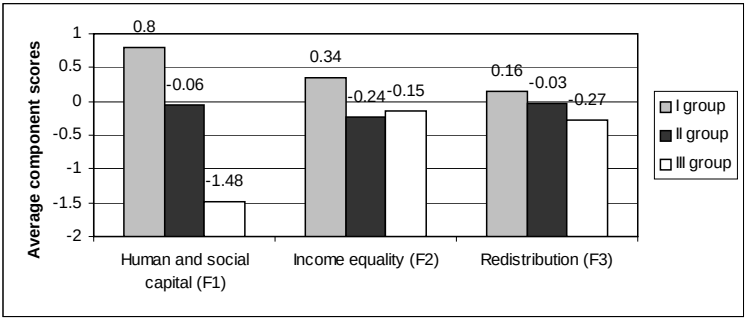

Figure 4. Average component scores of the country groups.

Figures 5–7 present component scores of each country by the pre-defined country groups. Countries are arranged by the added total of component scores (see the values in the last column of the table in Appendix 3), starting with the highest. Looking for general regularities inside the country groups, we can first see that Group 3 is the most homogeneous, while there are significant intra-group differences both in Group 2 and (especially) in Group 1, concerning income equality and redistribution policies. In Group 3, the component scores of human and social capital are clearly lower than the scores of income equality and redistribution, the latter ones being almost equal to each other in all countries (see Figure 5).

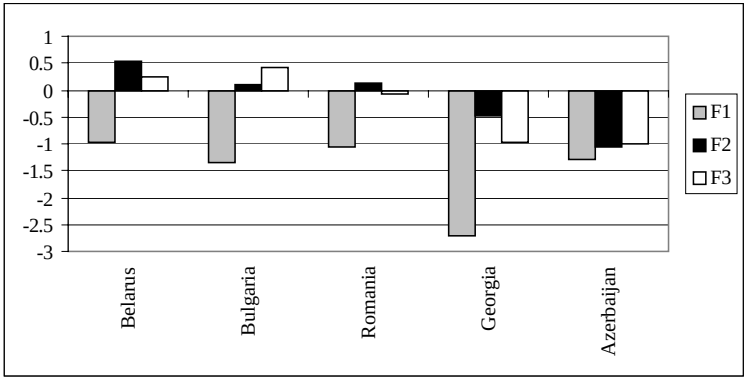

Figure 5. Component scores of individual countries in Group 3.

In Group 2, older EU member states like Italy, Portugal and Greece become expectedly distinct with their higher scores of human and social capital (see Figure 6). However, looking at the factor scores of income equality and redistribution, there is no apparent pattern or logic. We can see that in Spain, Italy, Portugal and Estonia, the scores of equality are remarkably lower than those of redistribution. In Greece, the low level of equality is combined with even lower level of redistribution. In other countries the levels and differences between F_2 and F_3 are less significant.

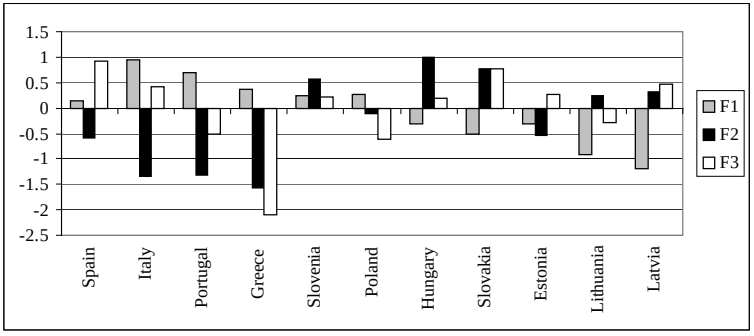

Figure 6. Component scores of individual countries in Group 2.

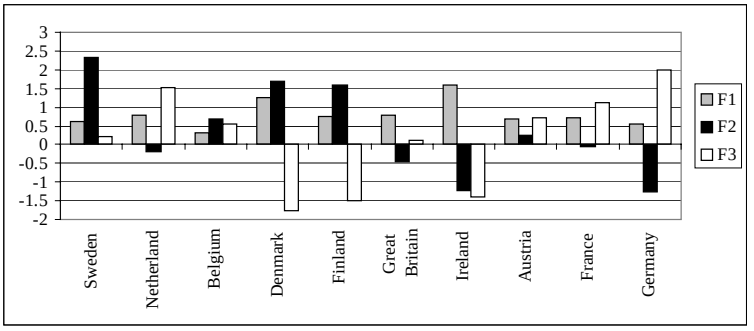

Figure 7. Component scores of individual countries in Group 1.

Figure 7 present the component scores of Group 1. In Scandinavian countries, the scores for income equality are high and the scores for redistribution relatively low. This confirms the logic that income distribution should equalise when the country reaches higher development levels. If it doesn't happen, other ways should be found to compensate for the negative impact of inequality on economic development. One possibility is to develop human and social capital through other (institutional) channels, as it has been done in Ireland and United Kingdom. Another choice is to redistribute wealth for social purposes, as in case of Germany, Netherlands and France. In these countries, the component scores for redistribution are remarkably higher than for income equality.

4. THE EFFECT OF DERIVED COMPONENT SCORES ON WELFARE INDICATORS

The previous analysis in section three demonstrates that there is no apparent pattern in which social components have the strongest impact on economic development. Comparing the country rankings based on the HDI and the sum of all three

component scores (see columns 3 and 11 in Appendix table 3), we can see that low scores of equality and/or redistribution often result in lower cumulative ranking position, and vice versa. Ireland is an extreme case, falling from the position 4–7 by the HDI to 21st place by the sum of component scores. Slovakia and Hungary represent an opposite case – their HDI rankings are 18 and 19, respectively, but the higher scores of equality and redistribution move them up by 9 and 6 positions.

In order to control statistically the impacts of the general set of indicators on the development indicators, a regression analysis was run with component scores as exogenous variables (F_1 – human and social capital, F_2 – income equality, F_3 – redistribution). GDP per capita (PPP), the HDI value and adjusted net savings were used as endogenous variables of economic development. The regression results are presented in Table 6. Unfortunately, it was not possible to explain the formation of adjusted net savings via a reliable regression model. This may be due to the small set of data, or because of the fact that the the formed social development factors have only a minor effect on adjusted net savings, as long as the latter term does not include depreciation of social capital. However, earlier work of Nettan (2005) with a similar dataset (although using a longer time span) has showed that the rate of adjusted net savings depends on macro-level social capital (approximated by political stability) both in the old and new member states of the EU, whereas the impact is stronger in the case of new members. Also, the aggregated quality of governance was found to have a statistically significant impact on adjusted net savings in the old member states of the EU (ibid).

Comparing the significance of component scores in different regression models, it appears that the first component is significant both in the formation of GDP per capita and HDI values, but insignificant concerning adjusted net savings formation. These results (except the last one) are consistent with the theoretical assumptions. The second component has a statistically significant effect only on adjusted net savings, but as noted, this model as a

whole was statistically insignificant. However, this result could imply that the issue of income distribution is important for sustainability of development – although positive coefficients indicate that higher inequality leads to a higher sustainable savings rate. On the other hand, this is consistent with the theoretical assumption that the concentration of income in the hands of small elite groups increases savings (therefore also sustainable savings) and investments.

Table 6. Social determinants of economic development (results of the regression analysis)

Dependent variable	GDP per capita (PPP)	ADNETSAV	HDI value
Constant	17.177*** (0.730)	12.769*** (1.049)	87.146*** (0.471)
F1	8.224*** (0.744)	1.815 (1.420)	5.914*** (0.481)
F2	0.526 (0.744)	1.720* (0.877)	0.647 (0.481)
F3	0.955 (0.744)	0.087 (0.907)	1.059* (0.481)
Adjusted R^2	0.829	0.088	0.861
SEE (standard error of the estimate)	3.721	4.159	2.403
Number of observations	26	21	26
F-statistic	41.429	1.640	52.690
Sig. of the model	0.000	0.217	0.000

Notes: Standard errors in the parentheses; * – significant at the level of 0.1, ** – significant at the level of 0.05, *** – significant at the level of 0.01.

The third component has a statistically significant effect only on the human development index. As human development is the main focus of our analysis, the formation of thehuman development index is discussed here in more detail. The regression analysis gave the following model with the HDI as a dependent welfare indicator (see also Table 6):

$$(2) \qquad \begin{array}{lllll} HDI_{100} = 87.1 + 5.9F_1 + 0.6F_2 + 1.1F_3 \\ Sig. \quad 0.00 \quad 0.00 \quad 0.19 \quad 0.04 \end{array},$$

where $HDI_{100} = HDI \times 100$ and $F_1 \ \ldots \ F_3$ are component scores. The model describes 86.1% of the variation in the dependent variable. As the mean values of all the independent variables are equal, it can be concluded that the first principal component called "human and social capital" has the highest influence on the HDI value. The impact of the second component "income equality" is almost ten times lower and its significance is also the lowest. This can be explained by the fact that the formation of income distribution has deeply related to historical developments and political system of a society. Ireland and United Kingdom, for example, are both having liberal regimes according to the typology of Esping-Andresen (1990). Income distribution in these countries has been constantly more unequal than in continental Europe, but on their HDI ranks (respectively 4th and 5th position in the current sample) refer to high development levels. In the group of new EU member countries, Estonia has the most unequal income distribution (the value of the Gini index is 37.6). Similarly to Ireland and United Kingdom, Estonia has followed liberal economic policies during the transition process, the result of which has been the increase in wealth, but also deepening income inequality. In the light of this information it is not surprising that the component scores of income equality in these countries are similar to each other and remain below the average of the sample as a whole (see Appendix 3).

As the substance of the third component (redistribution) remaines somewhat vague, it is difficult to explain its component scores. However, it is not reasonable to remove this component from the analysis, as the extreme values of F_2 and F_3 appear often in the same countries. Denmark and Finland, for example, have highest component scores in income equality, but lowest scores in redistribution. In Germany the situation is opposite – income equality scores are largely negative, but redistribution scores are the highest. This indicates that there could be some complemen-

tarities or trade-offs between income equality and redistribution, which were discussed in the end of the section 3.

Finally, the authors have analysed the development perspectives of the new EU member countries on the basis of changes in the HDI, which could take place if there will be favourable developments in component scores. Table 7 shows the values of the HDI predicted by the regression model (2) and their deviations from the actual values.

Table 7. HDI values predicted by the regression model

	HDI_{100} predicted values	Differences between predicted and actual values
Poland	87.9	–3.8
Hungary	86.0	–2.3
Estonia	85.2	–1.9
Slovakia	85.4	–1.8
Slovenia	89.1	–1.0
Latvia	80.8	0.3
Lithuania	81.5	0.9

According to the calculations, Poland could improve its HDI rank by five positions (from 35. to 30.) on account of the positive changes in the second and the third component. Hungary could also move up by five positions, from 38th to 33rd. Estonia, Slovakia and Slovenia could experience analogous movements. Altogether, five countries out of seven could improve their positions, while the order of the countries would remain unchanged and they also wouldn't get past the EU member states (although would gain on them). According to the aspects of development under consideration, Latvia and Lithuania do not have any reserves for improvement. On the other hand, we can conclude that these two countries have used their social development potential more effectively than other countries in transition, as their actual HDI values were higher than predicted by the model.

CONCLUSIONS

The concept of economic development and its factors has changed over time. As understood today, economic growth is no longer the only development objective – members of the society must also be guaranteed basic values like freedom, equality and security for higher level of welfare. These values are often contradictory in their substance and cannot be maximised simultaneously. In the long run, economic development should be sustainable, which means that today's developments should not compromise the capacity of the future generations to satisfy their needs. This concept involves also social aspects of development. As economic activities are largely linked to different kinds of networks, economists have recently focused on the contribution of social capital to economic growth and development. At the microeconomic level, this is seen primarily through the ways social capital improves the functioning of markets. At the macroeconomic level, institutions, legal frameworks and the government's role in the organization of production are seen as affecting macroeconomic performance. Another important aspect of the macro-level social capital is related to income distribution and social cohesion.

This paper presents an analysis, which aims to study the impact of social factors on economic development in 34 European countries. Unfortunately, some countries were excluded from the final analysis due to gaps in the data. The principal component analysis enabled us to group 18 selected independent variables into three components, which altogether describe 64.4% of the variation of the initial variables. The components are named as follows (in order of size of the variation described) – human and social capital, income equality, and redistribution.

As a result of the regression analysis, it turned out that all the components have positive effect on economic development

indicators. As it was not possible to explain the formation of adjusted net savings via a reliable regression model, we subsequently focused on human development index formation. The regression model with all of the components as independent variables describes 86.1% of the variation in the HDI value. It appears that the impact of human and social capital is about five times stronger than the impact of redistribution, and almost ten times stronger than the impact of income equality. Also, the statistical significance of the relationship between income equality and the HDI value is relatively low, but it gives no reason to deny the influence altogether. Despite of this we can conclude that most of the factors introduced in earlier research appear to play an important role in sustainable economic development of a country.

In general, our results are consistent with previous empirical work, suggesting that there is a significant and positive relationship between macro-level social capital (measured by different indicators) and economic development. However, it is difficult to draw more precise parallels with earlier research, as different authors use different statistical methods and data sources. In most studies, the dependent development variable is GDP per capita growth or share of investments in GDP, and the independent variables of macro-level social capital are not aggregated (at least not in a component analysis). As such, our focus on human development and sustainability is rather exceptional. Our approach also differs from others by incorporating possible impact channels (such as different fiscal policy instruments) of macro-level social capital into the analysis. On the other hand, it has been argued that using different indicators of macro-level social capital does not make the results of different studies irrelevant (Knack 1999). While any single measure of government social capital is imperfect, the shortcomings of each of the various measures are largely independent of each other. Therefore, these empirical findings must be considered very seriously. In the political sphere, this implies that if the goal is something more than simply a higher economic growth rate, policies leading to higher productivity

should be complemented by efforts to improve the quality of governance and to keep the social cohesion of the society. Besides direct positive effects on the country's credibility (in the eyes of foreign investors, for example) and individual-level life satisfaction, shortcomings in these aspects could also hinder long-run growth prospects.

Concerning implications for further research, the authors are planning to develop this research by incorporating more up-to-date data on economic development outcomes. Although the data of macro-level social capital are gapped and not available for each year, it is further possible to analyse time lags in relation to social development factors and outcomes. The theory also suggests that the payoffs due to improvements in institutional quality and social cohesion (or macro-level social capital) will not appear in the same period but later. More complete conclusions could be drawn when longer time series become available. For example, the comparison of the performance of the countries in Group 2 and 3 enables to evaluate how (and if at all) the EU membership helps to achieve social development goals.

Another interesting research direction would be the joint assessment of the economic effects of micro-level and macro-level social capital. This could lead to a better understanding of micro-macro linkages, thus helping to develop more effective policies for increasing the levels of social capital.

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KOKKUVÕTE

Makrotasandi sotsiaalse kapitali mõju jätkusuutlikule majandusarengule

Stabiilne majandusareng on jätkuvalt riikide üheks peamiseks majanduspoliitiliseks eesmärgiks. Samas on arengu mõiste ja arengut mõjutavate tegurite käsitlus ajas pidevalt muutunud. Kaasaegsetes arengukäsitlustes on üha suurem rõhk arengu sotsiaalsetel aspektidel, mille hulka kuuluvad inimeste heaolu ja valikuvõimaluste suurenemine, haridus- ja tervishoiuteenuste kättesaadavus, ühtlane tulujaotus ja sotsiaalne sidusus, ressurss-side jätkusuutlik kasutamine. Nende laiemate arengueesmärkide saavutamisel mängib olulist rolli sotsiaalne kapital – võrgustikud, normid ja üldine usaldus, mis hõlbustavad info liikumist ja aitavad kaasa turutõrgete kõrvaldamisele.

Käesoleva kirjutise eesmärgiks oli uurida makrotasandi sotsiaalse kapitali rolli 34 Euroopa riigi majandusarengus (lõplik analüüs hõlmas andmete puudulikkuse tõttu siiski vaid 26 riiki). Empiirilise analüüsi tarbeks jaotati riigid inimarengu taseme alusel kolme gruppi. Esimene grupp hõlmas Euroopa Liidu asutajaliikmeid ja Skandinaavia riike, teise gruppi paigutusid ülejäänud hilisemad liitujad (sh 8 uut liiget Kesk- ja Ida-Euroopast, kes ühinesid Euroopa Liiduga 2005. aastal) ning kolmandasse gruppi Euroopa Liitu mittekuuluvad post-kommunistlikud Kesk- ja Ida-Euroopa riigid. Analüüsi aluseks olid valdavalt 2001. aastat kirjeldavad paneelandmed, mis pärinevad erinevatest rahvusvahelistest statistikakogumikest.

Makrotasandi sotsiaalse kapitali näitajateks valiti varasema teoreetilise ja empiirilise kirjanduse alusel riigi institutsionaalset keskkonda, etnolingvistilist killustatust ning tulujaotuse eba-

võrdsust iseloomustavad muutujad. Lisamuutujatena hõlmati analüüsi mitmed avaliku sektori kulutusi ja tuluallikaid iseloomustavad näitajad, mis aitavad kirjeldada makrotasandi sotsiaalse kapitali sisulisi toimekanaleid. Valitud algnäitajate edasiseks koondamiseks kasutati komponentanalüüsi (peakomponentide meetod), mille käigus moodustus kolm komponenti: 1) sotsiaalne ja inimkapital, 2) tulujaotuse võrdsus ja 3) tulude ümberjaotamine. Nimetatud komponendid kirjeldasid kokku 64,4% algnäitajate varieeruvusest. Järgnev regressioonanalüüs kinnitas, et kõik kolm komponenti mõjutavad vaadeldud riikide majandusarengut (mõõdetuna inimarengu indeksi kaudu) positiivselt. Ootuspäraselt oli suurima tähtsusega sotsiaalset ja inimkapitali hõlmav komponent – selle mõju inimarengu indeksile osutus ligi viis korda suuremaks kui ümberjaotamise komponendil ning 10 korda suuremaks kui tulujaotuse võrdsusel. Tulemuste tõlgendamise muudab aga keeruliseks asjaolu, et teise ja kolmanda komponendi kujunemine on tugevalt mõjutatud iga üksiku riigi ajaloolisest arengust ning poliitilise süsteemi liberaalsusest. Liberaalse režiimiga riikides nagu Suurbritannia ja Iirimaa on traditsiooniliselt suhteliselt ebavõrdne tulujaotus, kuid samas on nende inimarengu näitajad kõrged. Tähelepanu väärib ka asjaolu, et teise ja kolmanda komponendi äärmuslikud väärtused esinevad sageli samades riikides – näiteks Taanit ja Soomet iseloomustavad kõrgeimad komponentkaalud tulujaotuse osas ning madalaimad ümberjaotamise komponendi väärtused; Saksamaal on olukord aga vastupidine. Euroopa Liidu uusimate liikmesriikide inimarengu indeksi tulevikuprognoosid leitud regressioonimudeli alusel näitasid, sotsiaalseid arenguressursse efektiivsemalt kasutades võiksid nimetatud riigid (välja arvatud Läti ja Leedu) oma positsiooni inimarengu indeksi pingereas parandada keskmiselt viie koha võrra.

Appendix 1

Structure matrixes of discriminant functions

Variable	Function 1 (social capital and income distribution)	Function 2 (taxation and social guarantees)
Quality of governance	0.746	
HDI value	0.642	
Public health expenditure per capita, PPP (ln)	0.559	
Public education expenditure per capita, PPP (ln)	0.468	
GDP per capita annual average growth (%)	0.321	
Tax revenue (% of GDP)	0.295	
Taxes on income, profits and capital gains (% of current revenue)	0.212	
General government final consumption (% of GDP)	0.198	
Ethnic fractionalisation	–0.126	
Income share held by highest 20%	–0.101	
Religious fractionalisation	–0.100	
GINI index	–0.092	
Income share held by highest 10%	–0.091	
Unemployment		0.359
Taxes on goods and services (% of current revenue)		0.187
Social security taxes (% of current revenue)		0.081

Appendix 2

Correlation coefficients between individual variables

	GDPPCPPP	HDI	ADNETSAV	PUBEDPC	QUAGOV	HEPCPPP	GDPPCAA	ELFRAC	GGOVFC	GINI
GDPPCPPP	1.000	0.871**	0.488**	0.814**	0.844**	0.925**	0.657**	–0.427*	0.352*	–0.210
HDI	0.871**	1.000	0.180	0.863**	0.925**	0.927**	0.757**	–0.520**	0.536**	–0.287
ADNETSAV	0.488**	0.180	1.000	0.359	0.290	0.233	0.519*	0.003	–0.118	–0.513*
PUBEDPC	0.814**	0.863**	0.359	1.000	0.836**	0.781**	0.752**	–0.423*	0.587**	–0.278
QUAGOV	0.844**	0.925**	0.290	0.836**	1.000	0.881**	0.721**	–0.523**	0.496**	–0.292
HEPCPPP	0.925**	0.927**	0.233	0.781**	0.881**	1.000	0.610**	–0.475**	0.466**	–0.202
GDPPCAA	0.657**	0.757**	0.519*	0.752**	0.721**	0.610**	1.000	–0.615**	0.285	–0.313
ELFRAC	–0.427*	–0.520**	0.003	–0.423*	–0.523**	–0.475**	–0.615**	1.000	–0.065	–0.031
GGOVFC	0.352*	0.536**	–0.118	0.587**	0.496**	0.466**	0.285	–0.065	1.000	–0.411
GINI	–0.210	–0.287	–0.513*	–0.278	–0.292	–0.202	–0.313	–0.031	–0.411	1.000

Notes: ** Correlation is significant at the level of 0.01 (two-tailed); * Correlation is significant at the level of 0.05 (two-tailed)

Appendix 3

Generalised variables of social development[12]

Country	HDI_{100}		Human and social capital (F_1)		Income equality (F_2)		Redistribution (F_3)		Sum of F_1, F_2 and F_3	
	Value	Group	Scores	Rank	Scores	Rank	Scores	Rank	Scores	Rank
Sweden	94.1	1	0.62	10	2.33	1	0.21	14	3.16	1
Netherlands	93.8	1	0.79	4	–0.19	16	1.52	2	2.12	2
Belgium	93.7	1	0.31	13	0.67	6	0.56	7	1.54	5
Denmark	93.0	1	1.27	2	1.69	2	–1.75	25	1.21	7
Finland	93.0	1	0.75	6	1.58	3	–1.48	24	0.85	10
Ireland	93.0	1	1.60	1	–1.22	22	–1.39	23	–1.01	21
Great Britain	93.0	1	0.77	5	–0.46	17	0.13	16	0.44	13
Austria	92.9	1	0.67	9	0.24	10	0.73	6	1.64	4
France	92.5	1	0.71	7	–0.04	14	1.11	3	1.78	3
Germany	92.1	1	0.54	11	–1.25	23	2.01	1	1.30	6
Spain	91.8	2	0.13	16	–0.58	20	0.91	4	0.46	12
Italy	91.6	2	0.94	3	–1.34	25	0.43	9	0.03	14
Portugal	89.6	2	0.69	8	–1.32	24	–0.50	19	–1.13	23

[12] In addition to the countries listed in the table, other countries like Armenia, Croatia, Czech Republic, Luxembourg, Macedonia, Moldavia, Russian Federation and Ukraine were included in correlation analysis, but due to fragmented data these countries could not be included in the component analysis.

Country	HDI_{100}		Human and social capital (F_1)		Income equality (F_2)		Redistribution (F_3)		Sum of F_1, F_2 and F_3	
	Value	Group	Scores	Rank	Scores	Rank	Scores	Rank	Scores	Rank
Greece	89.2	2	0.38	12	–1.58	26	–2.11	26	–3.31	24
Slovenia	88.1	2	0.24	15	0.57	7	0.22	13	1.03	8
Poland	84.1	2	0.26	14	–0.11	15	–0.62	20	–0.47	17
Hungary	83.7	2	–0.32	18	0.99	4	0.18	15	0.85	11
Slovakia	83.6	2	–0.52	19	0.76	5	0.78	5	1.02	9
Estonia	83.3	2	–0.32	17	–0.53	19	0.26	11	–0.59	18
Lithuania	82.4	2	–0.92	20	0.24	11	–0.28	18	–0.96	20
Latvia	81.1	2	–1.18	23	0.31	9	0.46	8	–0.41	16
Belarus	80.4	3	–0.97	21	0.55	8	0.24	12	–0.18	15
Bulgaria	79.5	3	–1.35	25	0.11	13	0.42	10	–0.82	19
Romania	77.3	3	–1.07	22	0.13	12	–0.07	17	–1.01	22
Georgia	74.6	3	–2.72	26	–0.48	18	–0.97	21	–4.17	26
Azerbaijan	74.4	3	–1.28	24	–1.06	21	–0.99	22	–3.33	25