Indicators of Economic Freedom and Economic Structure as Determinants of Growth and Convergence in Enlarging EU and Priorities for Estonia

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Abstract

Estonia and many other candidate countries will join the European Union with remarkably lower income levels. It is believed (e.g. European Commission, 2001) that they will face a rather long-lasting catching-up process. This catch-up phase is expected to be driven by convergence (Rajasalu, 2001). The paper studies some general indicators of institutional development as determinants of conditional beta-convergence in the European Union and candidate countries including some indicators of education and health, political rights and civil liberties. Indicators of economic freedom are studied more thoroughly. Estonia's prospects for catching-up and convergence with the European economies are assessed using most relevant institutional development and structural indicators. In order to better approximate growth rates, panel estimates of economic freedom indicators are complemented with structural indicators of economy.

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1. Introduction

Estonia’s GDP per capita at purchasing power parity (PPP) is much lower than in the European Union member states. The fact makes catching up and real convergence with the EU income levels one of the most urgent tasks of Estonia’s economic policy. According to the European Commission (2001, p. 19) estimations it will take 19 years before Estonia may reach 75% of the EU-15 GDP per capita level at purchasing power standards (PPS).

Building of efficient and credible institutions is thought to be one of the factors that can accelerate catching up and pave the way to real beta-convergence. Institutional development in candidate countries also increases coherence in integrating Europe and reduces idiosyncrasies in responses to European monetary and fiscal policies.

The current study tries to estimate contribution of some aggregate institutions to economic growth using the traditional conditional beta-convergence approach. Various indicators that proxy for institutional development are fitted into conditional convergence equations to find out which of them are topical in the EU enlargement context. We also assess Estonia’s prospects considering with reference to institutional development indicators that prove the best determinants of real convergence.

Since there are many methodological differences in national statistical data we used information provided by international organisations. This assumes that necessary amendments to make national data comparable have already been made in these data. We also concentrate on 15 European Union and 13 candidate countries to find out institutional determinants within this sample. Thus we neglect possible impacts of institutional developments that may be topical outside Europe or that cease to be of great importance after reaching some critical threshold level already achieved by the candidate countries.
2. Institutional Development in the EU Convergence Context

In this section I discuss different views expressed about convergence of per capita incomes. Actual GDP per capita developments do not always confirm the presence of overall absolute beta-convergence. Additional difficulties are faced when assessing convergence of the transition economies and European Union candidate countries.

It is rather broadly assumed that one reason why simple absolute beta-convergence tends to fail relates to the development of institutions and their role in economic advancement. The implications of institutions on the economic growth are often overlooked as well. North (1990, 1994) defined institutions as humanly designed formal and informal rules of the game. He showed how institutional development contributes to formation of effective markets. New Institutional Economists (NIE) criticised neo-classical economists for not paying enough attention to infrastructure and proper foundation of economics. Institutional development is a learning process in which shared individual beliefs form collective attitudes and turn into a kind of culture (in a very broad sense). In order to structure these collective attitudes and their interactions, human beings develop institutions. The economic implications of collective values and behavioural norms as well as public institutions have been studied by many authors. For instance, Kaufmann, Kraay and Zoido-Lobatón (1999, 2002) demonstrated direct impact of governance on incomes. Maximum productivity is related to an efficient co-operative system of industrial relations by Leibenstein’s (1966, 1978, 1987) and Altman’s (1996, 2001) x-efficiency theory.

Discussing the growth regression compilation, Durlauf and Quah (1998) relied on approximately 100 indicators used by researchers in growth equations. Many of these indicators also may be interpreted as proxies of indicators of institutional development - health, income inequality, politics (including civil liberties, political rights, instability), price distortions, religion, rule of law, trade and trade policy (openness, import penetration, outward orientation), etc. However, it is not easy to select most appropriate determinants of economic growth from this list. The large number of possible regressors and their inclusion into estimations by groupings makes it difficult to identify the robust or most significant ones and encourages the researcher to implement complicated approaches (Doppelhoffer, Miller, Sala-i-Martin, 2000). It should be also considered that many country-specific data specialities complicate simple cross-section
estimations so that adjustments are made for the data to be included in international data bases (De la Fuente, Donénech, 2000).

In addition to studies that relate economic growth to initial level of income there are also studies that include institutional development indicators in traditional production functions. Human capital that is often included in production functions (for instance, De la Fuente, Donénech, 2000) can be treated as an indicator of institutional development as well. A similar approach to human capital is often used in modelling implications of the ‘New Economy’ (Pohjola, 2002). In a broad sense, human capital may consider implications of education and culture, better legislation, quality of governance, well structured and efficiently performing procedures for interaction between businesses, state and individuals, etc.

Rodrik, Subramanian and Trebbi (2002) showed that institutions are very important from global aspect. However, it should not be forgotten that, especially in global context many other factors affect economy through institutions (Easterly and Levine, 2002) and often institutions smooth impacts of adverse shocks. The broader the geographical scope of the study and the greater the differences between the countries included in the study, the more growth seems to depend on institutions.

Although the world-wide impact of institutions on long-term economic development seems to be confirmed by mainstream economists it is still not obvious whether these findings are valid for candidate countries’ relatively short-term and rapid institutional and economic development. Therefore, it is worth checking whether the afore-mentioned expectations of conditional convergence and contribution of institutional changes on economic development hold within a smaller and more homogenous sample of states that includes EU member states and candidate countries during a time-span of about ten years. As many candidate countries are supposed to join EU soon, the processes in the European Union specific framework are of our primary interest. At the same time, European Union has been one of the ‘convergence clubs’ where real convergence has taken place although the process has been uneven in recent years (Rajasalu, 2001). Nevertheless, convergence in the EU offers some hopes for catching-up to new member states with much lower income levels.

If empirical data confirm real convergence within this period then we will try to assess Estonia’s performance within the process and compare actual developments with convergence potential derived from the EU and candidate countries empirics.
Targeting of our research at institutional development in the EU and candidate countries requires that some specific aspects be considered. Institutional changes tend to be rather slow in general (changes in governance may be one rare exception, perhaps). It takes quite a long time before implications caused by rather slow changes in education, culture, social networks, health, etc can be detected in real economy. Therefore, long time series must be used to achieve relevant results.

However, in the case of transition economies and EU candidate countries the need for long time series makes such research rather complicated. The transition processes of EU candidate countries have lasted about 10 years only; the harmonisation process with the EU economies after applying for the EU membership is even shorter. The time series available are not long enough and, even if available; these may include information that is irrelevant in the EU accession context. The developments before the 1990s were too fuzzy to draw clear-cut conclusions; information from this period often needs critical revision and processes of this period can hardly be extrapolated on in the after-accession period.

Even within this time, starting from the 1990s, distinction between two sub-periods can be made. The content of the first sub-period was the shift from planned to market economy in many CEE countries. Problems of privatisation, economic liberalisation, reduction of government intervention or participation in economic activities were of major importance in the first half of the 1990s. This was also a period of radical institutional reforms. However, in this period transition countries tolerated serious recessions related to transition shocks. The second sub-period (second half of the 1990s) was characterised by harmonisation with the *acquis communautaire*; building up of institutions based on shared values and approved behavioural norms. The data on economic growth in this second sub-period should reveal also the results of the reforms carried out during the first sub-period. Thus, we will draw conclusions on a broad set of issues based on growth data within a rather short time period. Moreover, even this period was affected by external shocks caused by Asian crisis in 1997 and Russian default in 1998.

To quantify implications of institutional development as well as changes in political rights and economic freedom we run 4 series of statistical estimations. First, we look the impact of education and quality of life on the level human development and economic growth worldwide and in the European Union and candidate countries. Second, we evaluate political rights and civil liberties as determinants of economic growth in EU and candidate countries. Third, we study economic freedom indices and sub-indices as economic growth determinants. Fourth, we complement economic freedom indicators with structural indicators to assess also implications of technological advance and investment intensity on growth. To follow the traditions of conditional beta convergence we include initial levels into regressions as well. By including these initial conditions, we are able to test beta-convergence.

3.1. Education and Life Expectancy as Very Weak Worldwide Determinants of Economic Growth

Many studies attribute economic growth to the level of education or human capital as measured with educational level of the labour force or population. However, information used in these studies, time periods covered and the sample of countries included make it difficult to implement in the evaluation of Estonia’s prospects.

For instance, the impact of knowledge and human capital on growth in OECD countries has been thoroughly studied by Bassanini, Scarpetta and others (Bassanini, Scarpetta, Visco 2000; Bassanini, Scarpetta 2001; Bassanini, Scarpetta, Hemmings 2001; Bassanini, Scarpetta 2002). Still, we do not know to what extent the findings are appropriate for the EU environment or whether these conclusions can be expanded to the Baltic States or Estonia. The problem is complicated by problems in data quality even in the OECD countries. There may be many compatibility problems in the education data in EU candidate countries.

There are also studies on implications role of education and human capital on economic growth in transition economies. Some of these studies also address income convergence with the EU levels. However, these studies often neglect the Baltic States and sometimes
the data include years before the radical political and structural reforms.

For instance, Barbone and Zalduendo (1996) studied income convergence in 5 CEE countries (Czech Republic, Hungary, Poland, Slovakia, Slovenia) using Penn World Tables Mark 5.6 data for 1965-1989. They found that quality of human capital is essential for economic growth but it must be accompanied by appropriate policy, regulatory and legal framework. Monetary and fiscal policies, rule of law as well as openness to trade were also found to be key determinants of economic growth. However, one may suspect that radical policy reforms, harmonisation with the acquis communautaire and expected accession to the EU may have changed and will change the economic environment in CEE countries so that the factors which determined pre-transition growth (within CMEA) until 1989 may not be appropriate today and in the near future within EU framework.

According to the New Growth Theory, human capital is broadly expected to be very important for growth. Since many transition economies inherited high (nominal) human capital relative to GDP per capita from the pre-transition period, they are expected to have good prospects for economic growth. However, Spagat (2002) found that human capital of transition economies might also deteriorate. Educational standards and traditions take long time to build up but may be lost relatively quickly, transition brings new requirements, industries, etc.

Due to the ‘poverty trap’ human capital may decline to meet low living standards (Spagat, 2002). He points out two parallel processes – those transition economies which are doing well and will join EU soon, can preserve and enhance their human capital potential and it will promote economic growth. However, for some transition countries and perhaps even in some regions of otherwise successful countries public spending on education or financial resources of parents may be insufficient, enrolments’ decline and human capital deterioration seems very real. It draws our attention to the fact that the processes in the EU candidate countries may differ from those in less successful transition economies.

To start with the simplest cross-country evaluation of education as determinant of economic growth we first examine data from the UNDP Human Development Report (HDR 2001). We use education indices (abbreviation \textit{EDU\_IND}) and combined primary, secondary and tertiary gross enrolment ratios (in \%, \textit{ENROLM}) as proxies for education and life expectancy indices (\textit{LIFE\_IND}) and life expectancies at birth (in years, \textit{LIFE\_EXP}) as proxies for the health of
nations. We define \textit{GROWTH} as index of per capita GDP at PPP in 1999 compared to 1993 level. We also include 1993 GDP per capita at PPP as the initial level (\textit{LEVEL93}) into traditional conditional convergence equation.

The correlation matrices in Tables 1 and 2 show that education and life expectancy indicators are better correlated with levels of GDP per capita than GDP growth rates. Positive correlation between education and life expectancy indicators is slightly higher in the European Union member states and candidate countries (sample of 28 countries) than in the world-wide sample of 154 countries. Against the beta-convergence hypothesis, there was a weak positive correlation of growth rates of GDP per capita in 1993.

\textbf{Table 1. Correlation Matrix for 154 countries}

\begin{table}[h]
\begin{tabular}{|c|c|c|c|c|c|}
\hline
 & GROWTH & LEVEL93 & EDU. IND & ENROLM & LIFE. IND & LIFE. EXP \\
\hline
GROWTH & 1.000000 & & & & & \\
LEVEL93 & 0.028174 & 1.000000 & & & & \\
EDU. IND & 0.097410 & 0.626839 & 1.000000 & & & \\
ENROLM & 0.119698 & 0.668463 & 0.913289 & 1.000000 & & \\
LIFE. IND & 0.054654 & 0.685778 & 0.790962 & 0.753296 & 1.000000 & \\
LIFE. EXP & 0.054656 & 0.685902 & 0.791006 & 0.753539 & 0.999891 & 1.000000 \\
\hline
\end{tabular}
\end{table}

\textbf{Table 2. Correlation Matrix for EU15 and CC13}

\begin{table}[h]
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
 & GROWTH & LEVEL93 & EDU. IND & ENROLM & LIFE. IND & LIFE. EXP \\
\hline
GROWTH & 1.000000 & & & & & \\
LEVEL93 & 0.089502 & 1.000000 & & & & \\
EDU. IND & 0.127943 & 0.517711 & 1.000000 & & & \\
ENROLM & 0.064437 & 0.537096 & 0.901221 & 1.000000 & & \\
LIFE. IND & 0.125441 & 0.825961 & 0.559582 & 0.571923 & 1.000000 & \\
LIFE. EXP & 0.118208 & 0.828122 & 0.538597 & 0.575739 & 0.998813 & 1.000000 \\
\hline
\end{tabular}
\end{table}

A cross-country regression of growth rate on the initial GDP and on education measures shows the following (sample of 154 countries, with values of t-statistic in parenthesis):

\[
GROWTH = 1.0597 - 0.0041*LEVEL93 + 0.0026*ENROLM.
\]

(1)

(11.91) (0.865) (1.683)

However, this regression resulted in a low adjusted \textit{R}\textsuperscript{2} value of 0.006 only. The initial level of GDP in 1993 entered into regression with the theoretically correct sign but remained statistically insignificant. The combined level of primary, secondary and tertiary
enrolment is found to be significant with 90% confidence level. Health indicators were not significant in regression. Regressing the logarithms of growth rates on logarithms of enrolment improved the empirical results slightly.

While it would be interesting to estimate the same model for EU and candidate countries, it was not possible to find a satisfactory model.

Thus, although the education and life expectancy sub-indices together with the GDP per capita index are used in the formation of general Human Development Index and also can predict GDP per capita level at PPP in 1999, these indicators failed to explain economic growth. Our failure in this estimation is not surprising based on the work by Fuente and Donénech (2000). These authors showed that even in OECD countries human capital stock may be measured with errors and data deficiencies may be partially responsible for poor empirical performance of human capital in growth equations. The authors reached theoretically plausible results that survived robustness check only after a thorough revision of national data. In our case it should be also noted that the enrolment indicator might be misleading for smaller countries as many students continue their tertiary education abroad. The enrolment ratio as well as length of schooling may not describe content of the education. There may also be mismatches in the quality and professional structures in labour demand and supply etc.

Our very simple exercise with HDI data revealed that general education and life expectancy indices could hardly be treated as determinants of economic growth or convergence. Even if there is some very weak positive correlation in world-wide data, the indicators fail to explain growth rate differences within the enlarging EU.

3.2. Political Rights and Civil Liberties as Growth Regressors

In addition to education, which may describe the nation’s potential for development it is important to consider political rights and civil liberties that indicate the opportunities to use this potential. Many studies link various freedom indicators to economic growth. Political rights and civil liberties were included into cross-country growth and convergence regressions for instance by Barro and Lee (1994), by Sala-i-Martin (1997) and de Melo et al. (1997).

Studying the role of institutions in transition, Havrylyshyn and van Roden (2000) suggested distinguishing two categories of
institutions that are separately measurable and may have separate effects on economic performance:

? Political and civic freedom, which includes democratic process, freedom of assembly and speech, equal treatment of political and judicial bodies etc;

? Legal framework for economic activity that includes legislation for free economic activity, contract law, rule of law and transparency, security of property rights etc.

In our paper, we use Freedom House indicators (FH 2001) of political rights and civil liberties as the first category of institutions that concern more general values. We also restrict our sample to the enlarging EU that included 15 member states and 13 candidate countries. Data about some candidate countries is available since the beginning of 1990s only. To have our sample less biased and not too dominated by the information available about EU member states only we used the information since 1980.

In FH country ratings the indices between 1 and 2.5 are given to countries that are considered to be “free”; indices between 3 and 5.5 indicate “partly free” countries, while indices between 5.5 and 7 describe countries that are “not free”. Those indices were interpreted as proxies for institutional development – the smaller the value of index and the more freedom a country enjoys, the more developed its institutions should be.

The GDP annual growth indices (acronym GROW) as well as GDP per capita levels at PPP (in thousand current US dollars, acronym GDP followed by two digit year number) were taken from the World Bank database and also from the World Bank NHP (Nutrition, Health, and Population) database. For filling in some missing observations we used also data from Eurostat, OECD, UN and other statistical sources.

We started with a simple estimation of cross-section regression that included GDP annual growth indices (as dependent variables), GDP per capita at PPP in 1992 (the first year with data that covered all selected countries) and indices of political rights and civil liberties as conditioning independent variables. The data were organised as a panel of 1980-2001 data pooled across 28 countries (15 EU member states and 13 candidate countries). For many candidate countries (and for re-united Germany) the time series were shorter we used an unbalanced sample in our estimations.

The panel data estimation with common coefficients and intercept produced the following result (t-Statistics in parenthesis):
\[ \text{GROW} = 1.0575 - 0.000986 \times \text{GDP92} - 0.00876 \times \text{POLI(-4)}, \]
\[ (160.04) \; (-2.896) \; (-6.938) \]

where \( \text{GROW} \) is annual growth index, \( \text{GDP92} \) is the value of GDP per capita in thousands of PPP adjusted USD and \( \text{POLI(-4)} \) is index of political rights\(^4\) for the country four years earlier. Civil rights indicators were less important (with all tested leads), and so were political rights indicators with other leads. Thus, the maximum impact of changes in political rights on economic growth occurs after 4 years being less significant earlier and later.

However, although the coefficients for GDP per capita level and political rights had correct signs in conditional beta convergence context (the higher the GDP per capita and the less political rights the country enjoys, the lower the annual GDP growth index is) and were statistically significant, the adjusted \( R^2 \) value remained 0.106. Due to this regression, the growth rate is mainly determined by intercept while differences in income levels and political rights make only minor corrections to it. Since the time series were short (especially for candidate countries), the panel regression result was driven mainly by cross-country differences and possible non-stationarity of time series was of minor importance.

We also estimated the regression for a shorter period (1992-2001) to verify that equation (2) is not too dominated by longer time series of EU member states (or states that were not yet EU members then). This check gave almost the same results as equation (2) although with a little lower adjusted \( R^2 \) value (0.085).

While trying to estimate the same function with country-specific coefficients for political rights indices, these coefficients turned statistically insignificant or obtained a “wrong” sign. Only for Bulgaria, Czech Republic, Hungary, Ireland and Romania the regression remained statistically significant while for other countries in the sample the coefficient for political rights remained statistically insignificant.

Considering the fact that political and civil rights indices were equal and constant for almost all EU member states it was quite expectable that their growth differentials have to be determined by other factors. Thus, the member states participated in the panel estimation mainly in the form of cross-country regression while there were almost no political rights’ or civil liberties’ changes.

Thus, although the equation (2) gives some explanation to growth rate differences in enlarging EU in general, one must be
careful in drawing any conclusions regarding individual countries. As the country-specific estimation failed for Estonia, the regression does not confirm that Estonia’s very high political and civil rights’ indices were reliable determinants of further economic growth and convergence to the EU.

3.3. Impact of economic freedom on growth

Since broad indicators of institutional development did not provide a good explanation of differences in economic growth, we turn to indicators that are more closely linked to economic activity and can be treated as the second category of economy-related institutions in the afore-mentioned distinction made by Havrylyshyn and van Roden (2000). Many aspects of economic freedom have found to be significant determinants of economic growth (usually in broader samples of countries). For instance, Knack and Keefer (1995), and Voigt and Engerer (2002) discussed property rights as determinants of economic growth. Kaufmann, Kraay and Lobatón (1999, 2002) studied the role of governance. Murrell (1992, 1996) studied sequencing of liberalisation and institutional development for the transition process. Piazolo (1999) found that economic growth in 25 transition economies was positively correlated with the advancement of institutional change (assessed by EBRD in nine different areas) and with increase in the capital stock in transition economies. There are also many studies of corruption, rule of law etc.

The indices of economic freedom (and their sub-indices) published by the Heritage Foundation (2000) may serve as proxies for institutions concerning economic freedom. At least by definition these indices and sub-indices describe development of important institutional issues. We assume that an index of economic freedom represents development of responsible institutions in a country. The index of economic freedom is published in the beginning of a year based on the information available before July in the previous year, thus the index for 2002 is based on developments from July 2000 to the end of June 2001. As a result, the available indices from 1995 to 2002 actually describe how countries scored in 1994-2001. The list of 50 independent variables is divided into 10 broad factors (or sub-indices) of economic freedom. The higher the score of a factor, the greater the level of government interference in the economy and the less economic freedom a country enjoys (index 1 describes the freest economies while a score of 5 signifies a set of institutions and policies that are least conducive to growth). The sub-indexes include:
Fiscal burden of government (measured by tax rates, government expenditures, methods of financing expenditures, etc. to capture the true cost of government to society) – acronym FISC;

Trade policy (measured by such impediments to trade as tariffs and duties, quotas, licensing requirements, corruption within customs service etc.) – acronym TRAD;

Government intervention in the economy (government consumption as a percentage of economy, government ownership of businesses and industries, economic output produced by the government etc) - acronym GOVE;

Monetary policy (the main criterion is inflation that confiscates wealth and distorts pricing, misallocates resources and undermines a free society) - acronym MONE;

Capital flows and foreign investment (restrictions on foreign investment and inflow of foreign capital in foreign investment code, restrictions on foreign ownership, unequal treatment of foreign and domestic investors, restrictions on repatriation of earnings etc.) – acronym FORE;

Banking and finance (evaluated through government ownership in banks and government influence over allocation of credit, restrictions to foreign banks, restrictions to offer financial services like transactions with securities and insurance activities) – acronym BANK;

Wages and prices (extent of government wage and price controls that distort allocation of resources to their highest use or market value, government subsidies to businesses) – acronym WAGE;

Property rights (legally granted and protected private property, commercial code defining contracts, government expropriation of property, government influence on judicial system, delays in receiving judicial decisions, corruption within judiciary) – acronym PROP;

Regulation (licensing requirements to run businesses, ease of obtaining licenses, environmental and labour regulations including paid vacations and parental leave, corruption and uniform appliance of regulations) – acronym REGU;

Black market (as a reaction to government intervention and restrictions but also as smuggling, piracy of intellectual property, production of goods and services for black market) – acronym BLAC.

The economic freedom in a country in general is assessed by an overall index (acronym OVER). Four broad categories are
distinguished on the basis of overall index: countries with score under 1.95 – free, with score between 2 to 2.95 – mostly free, with score between 3 and 3.95 – mostly unfree and countries with score of 4 or higher – repressed.

In order to quantify possible implications of economic freedom on growth in EU member states and candidate countries we first estimate regression between growth, overall index of economic freedom and initial income level. Panel estimation of cross-country data for the period 1994-2001 gave the result:

\[
GROW = 1.0918 - 0.0009802*GDP93 - 0.01823*OVER \\
(55.33)(-2.1531) (-3.1212)
\]

where \(GDP93\) was the value of GDP per capita in thousands of PPP adjusted USD in 1993 as indicator of initial income levels and \(OVER\) was the overall index of economic freedom. Initial income level and overall index of economic freedom had the theoretically “correct” correlation (higher initial income level and less free or more repressed economy tended to reduce growth rates) and was found to be statistically significant. Negative dependence on initial income level implies that convergence can be expected in the long run. However, adjusted \(R^2\) of this estimation was as low as 0.035.

Estimation of the regression with all 10 sub-indices of economic freedom included (Appendix 1) that only three of them were statistically significant (and had correct sign). Thus, after stepwise exclusion of insignificant indicators we reached an equation:

\[
GROW = 1.13598 + 0.006019*BANK - 0.016402*FISC - 0.0100816*FORE\?
(64.34) (2.0224) (-4.2657) (-2.5232)
-0.00261486*MONE - 0.0075387*REGU \\
(-2.0416) (-2.0295)
\]

However, the indices on banking and finance that considered government ownership in banks, government influence over allocation of credit and restrictions to activities of foreign banks occurred to be positively correlated to growth. The coefficient for \(BANK\) indices has a clearly unacceptable ‘wrong’ sign that does not comply with theory based expectations. The adjusted \(R^2\) value of this regression reached 0.142.

After exclusion of the \(BANK\) variable, the \(REGU\) variable that considered licensing requirements, environmental and labour
regulations, was insignificant as well. Thus, the final regression equation with economic freedom sub-indices was:

\[
GROW = 1.1354 - 0.018709*FISC - 0.0081808*FORE - 0.0027814*MONE \\
(63.83) \quad (-5.185) \quad (-2.1639) \quad (-2.3479)
\]

Regression (5) gives a little higher adjusted \( R^2 \) value (0.127) than equation (3), however, initial income levels failed to enter as statistically significant determinants of growth. Thus, the combination of sub-indices explains growth rates but does not confirm convergence towards the steady state growth rates.

Among the economic freedom sub-indices the contribution of fiscal burden is the highest. An improvement of fiscal sub-index by 1 unit (from 3 to 2, for instance) results in a 1.87 percentage point higher annual growth rate. Equal improvements of sub-indices that described regulations of foreign capital movement or monetary policy yielded smaller growth accelerations. If a country reaches the highest possible ratings for the afore-mentioned sub-indices (all of them equal to 1), then based on equation (5) about 10.7 per cent annual growth rate can be expected. The indices usually shared by many EU member states are \( FISC – 4.5, \ FORE – 2, \ MONE – 1 \), which predict 3.2% annual GDP growth (actual growth in EU15 was 3.4% in 2000 and 1.5% in 2001). Estonia’s corresponding indices in 2001 (3.5; 1 and 2) predict 5.6% growth rate (instead of actual 7.1% in 2000 and 5.0% in 2001).

Nevertheless, the afore-mentioned sub-indices of economic freedom should not be treated as strong determinants of growth as the value of adjusted \( R^2 \) was still quite low. Many sub-indices of economic freedom which in economic context should be of great importance (impact of black market, overregulated labour market with wage rigidities, trade policies etc) did not enter into growth regression. It does not mean that these institutional indicators are not important at all. The indicators that entered into regression equations were simply more significant. With some loss in prediction power these may be replaced by other indicators.
3.4. Augmented Regression with Some Real Economy Indicators

Next we insert into the regression some indicators of the real economy that may complement institutional or other determinants of economic growth and give some additional, more detailed information. Thus, besides sub-index $\text{TRAD}$ that was related to restrictions in trade, we insert into the regressions actual ratios of exports of goods and services to GDP (acronym $\text{EKSP}$). We also included actual inflation rate (measured as GDP deflator, acronym $\text{INFL}$) to detail the $\text{MONE}$ sub-index that also concerned inflation. Besides the $\text{FORE}$ sub-index that concerned regulations on foreign capital movement we insert actual net inflow of direct investment as ratio to GDP (acronym $\text{FDI}$) and actual gross capital formation as ratio to GDP (acronym $\text{CAP}$). In order to consider also impact of the ‘New Economy’ and ICT penetration we added the share of high-technology exports (as per cent of manufactured exports, acronym $\text{HIGH}$), number of personal computers per 100 inhabitants ($\text{PC}$), also number of internet users per 100 persons, ($\text{INT}$) and number of telephone lines and mobile phone subscribers per 100 population (acronym $\text{PHON}$). These data were retrieved from the World Bank, UNO and ITU databases.

Initially we conducted a panel estimation with all of the sub-indices of economic freedom and all of the additional structural and ICT indicators. The panel estimation results (Appendix.2) included many statistically insignificant variables and also some significant variables with a ‘wrong’ sign.

The best approximation of economic growth reached after exclusion of insignificant and ‘wrongly’ performing variables is depicted in equation (6) and Appendix 3.

$$GROW = 1.1136 - 0.0156*OVER - 0.0186*FISC + 0.00173*CAP - 0.00715*INFL + 0.00040*HIGH$$

(6)

This panel estimation gave the adjusted $R^2$ value of 0.37 and approximates growth rates clearly better than equation (5), which included only economic freedom indicators.

Equation (6) reveals that the most important determinants of annual growth indices within the sample of 28 EU member states and candidate countries are overall economic freedom indices, fiscal burden sub-indices, gross capital formation ratio in GDP (in per cent), inflation (measured as GDP deflator index) and share of high-technology exports.
technology exports in manufactured exports (in per cent). Initial income level failed to be statistically significant in explaining growth rates. Thus, the regression gives more or less satisfactory approximation of growth rate differences but does not confirm long run convergence (faster growth or catching-up of initially low-income economies).

This very simple augmentation of economic freedom data with some structural indicators showed that within the sample of European Union member states and candidate countries institutional indicators alone (or together with initial income levels) do not predict growth rates of economies well enough. Institutional development indicators seem to describe rather preconditions of economic development than perform as determinants of exact economic growth. Inclusion of some structural indicators together with institutional indicators into regressions can remarkably improve the quality of economic growth predictions.

Nevertheless, a comment is to be added here. Equation (6) concerns the whole sample of 28 countries. For individual countries the best selections of growth determinants may be different. For instance, the same panel estimation with country-specific estimates of intercepts raised the adjusted $R^2$ value to 0.58 but made all other variables besides $CAP$ statistically insignificant. This means that only the fine-tuning of intercepts for each country leads to a different set of statistically significant independent variables. However, our purpose here was just to identify most important determinants for the enlarging EU and not for individual countries. If for some candidate countries the set of most important growth determinants has been different until now, it does not mean that this country-specific set will be as important after accession into EU. On the other hand, the European Union itself will also be a little different after enlargement and the determinants that guided development of relatively well-doing countries may lose some of their importance for some time. Therefore, we found it essential to evaluate these possible growth determinants for the whole sample.

Although the discussed indicators failed to be strong and exhaustive determinants of economic growth within the EU framework, these can still explain approximately one-third of the economic growth variances. Evaluation of Estonia’s prospects in the light of indicators that proved to be most important for the enlarging EU in general confirms positive expectations of the future.

First, the Heritage Foundation ranked Estonia among the freest countries in the world. By overall index of economic freedom Estonia
occupied the fourth place in 2002 (with overall index score 1.8) and the sixth place in 2003 with the same score. Thus, based on the overall index, Estonia is ahead of other European Union candidate countries and many current member states (just behind Luxembourg, Ireland and Denmark).

Second, by fiscal burden in 2002, Estonia scored on the same level with Ireland, Cyprus, Latvia and Lithuania (score of 3.5) and ahead of other EU member states and candidate countries. For 2003, Estonia’s scoring remained the same and was shared with Lithuania and Cyprus while Ireland moved ahead to 3.0 and Latvia fell to 4.0. Nevertheless, Estonia’s position among EU member states and candidate countries is rather promising. It should be also mentioned that lower fiscal burden is often shared by economies that otherwise tend to be under-regulated, have remarkable shares of black market and do not occupy high positions by overall index. Opportunities for radical reduction of fiscal burden index within the EU environment are scanty.

Third, the share of gross capital formation in Estonia’s GDP was rather high also. The average for 1994-2001 reached 27.7%, being higher in Slovak Republic, Czech Republic and Hungary. Capital formation ratios in EU member states tended to be lower.

Fourth, although the inflation rate was very high initially it has declined remarkably in recent years. Estonia scored immediately after Lithuania, Latvia and Malta with the fourth lowest harmonised consumer price index among candidate countries in 2000. Price dynamics will be further kept under control also by aspiration to join the ERM 2 mechanism right after accession and the need to comply with the price stability requirements in Maastricht criteria.

Fifth, the average share of high-technology exports in total manufacturing exports (14.5%) during 1996-2000 placed Estonia ahead of many candidate countries and some EU member states. Although in 2000 Estonia scored the fifth place in our 28-country sample with 29.8%, it still remained quite far from 72% in Malta, 47% in Ireland, 35% in Netherlands and 32% in the United Kingdom. However, it is appropriate to mention that volatile volumes of subcontracting to Nordic countries raised the share of high technology exports to exclusively high level in 2000 and it may be difficult to maintain this level in the circumstances of worldwide ICT sector recession.

Nevertheless, these five most significant economic growth determinants insist that Estonia’s prospects may be rather good. When we fit recent available Estonian data into the equation (6), we find a
predicted annual growth rate of in more than 7%. This shows that the growth rates reached in recent years (7.1% in 2000, 5.0 in 2001 and 5.7% during three quarters of 2002) are close to what might have been expected. However, one must not forget that the afore-mentioned factors explained only one-third of the economic growth variances in EU and candidate countries. Growth rates depend on many other factors as well.

4. Conclusions

There are many studies about beta convergence of cross-country incomes. Nevertheless, empirical data do not confirm the general convergence hypothesis and income divergences seem to prevail instead of catching-up. There are ideas that growth theories may fail due to the fact that the role of institutions and institutional development is often overlooked. Numerous studies relate economic growth to institutional development; however, these studies are based on worldwide cross-country samples and often cover rather long time series. One cannot deduct from these studies that institutions and variances in their development play the same role within the smaller sample of European Union member states and candidate countries. The problem is aggravated by the fact that for many candidate countries the data before 1990s belong to rather different “pre-transition” era and as many of them will be accessed to the EU soon, then these “pre-transition” findings can hardly guide their further development within the EU.

In this study we tried to find out whether there are easily accessible institutional indicators that may serve as determinants of economic growth and convergence within the enlarging EU. If such indicators had been available, we would have tried to assess Estonia’s prospects considering these indicators.

We failed to prove the impact of education (measured by combined primary, secondary and tertiary enrolment or education index in the Human Development Report) on growth rates in EU member states and candidate countries. The problem may be also too aggregate information on education that fails to reveal structural differences in education, or its quality and compliance of nominal education levels with demand of labour market. Official statistics on education can be misleading in measuring actual knowledge of population.
We found a very weak impact of political rights and initial income levels on growth rates. Although these indicators can explain only about 10% of the growth rate variances, these findings confirmed that if no other determinants are considered, Estonia may expect relatively high growth rates (as initial income level was low and the highest level of political rights is shared with most of the European economies). As initial income level is inversely related to growth, then it supports expectations about beta convergence and catching-up.

The overall index of economic freedom along with initial income levels proved to be rather weak determinants of growth rates also. Sub-indices of fiscal burden, foreign capital inflow restrictions and monetary restrictions explained growth rates a little better. However, a combination of these sub-indices outperformed influence of initial income level differentials and thus does not confirm convergence or catching-up.

Our final test revealed that the growth rate differentials in the EU and candidate countries might be much better approximated if economic freedom indices were complemented by some real economy indicators. For instance, regression of growth rates on overall economic freedom and fiscal burden indices with gross capital formation ratios, inflation and shares of high technology exports in total manufacturing exports gave remarkably better results.

A simple exercise with available data on institutional development revealed that although institutions provide necessary environment for economic transactions, institutional development indicators alone could not predict growth rate differentials well enough. A reason for this finding may be that we discussed institutions in a too aggregate way. Although there are quite large growth rate differences between the EU member states, they often share similar level of institutional development. It may be also that the contribution of institutional development is more important worldwide and ceased to have great impact on growth after passing a certain threshold level or after becoming similar in the result of harmonisation process. Developed institutional framework may also support stability of growth and reduce risks or implications of adverse shocks. Nevertheless, it seems that institutional development provides preconditions for economic growth but the actual growth rates depend on many other factors as well. It confirms once again the conclusion reached by Havrylyshyn and van Roden (2000) that institutions matter (in transition) but so do policies.
Notes

1. Therefore the enrolment ratio for Luxembourg was as low as 72%, for instance. Simultaneously, the enrolment ratios for countries that teach many foreign students may be a little higher. However, within the economic growth context well-known universities with lots of foreign students are also centres of intellectual potential that promote development.

2. Their sample included CEEC countries and descendants of the former Soviet Union.

3. Thus, since earlier data were not available we used the level in the middle of the period instead of the traditional initial income level.

4. The smaller the value of political rights indicator is, the more political rights the country enjoys, thus decline of index from 7 (“not free”) towards 1 (“free”) contributes to the growth rate.

5. Here we used years as published by the Heritage Foundation. As it was mentioned before, evaluations are based on the data of previous year, thus the index for 2003 actually describes the situation from July 2001 to June 2002.

References


### Appendix 1. Estimation with All Sub-Indices of Economic Freedom

Dependent Variable: GROW?
Method: Pooled Least Squares
Date: 12/05/02   Time: 16:42
Sample: 1994 2001
Included observations: 8
Total panel observations 215

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<th>Prob.</th>
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R-squared     0.182918     Mean dependent var 1.032595
Adjusted R-squared 0.138643     S.D. dependent var 0.029126
S.E. of regression 0.027032     Sum squared resid 0.148337
F-statistic       4.131379     Durbin-Watson stat 1.463043
Prob(F-statistic) 0.000017


## Appendix 2. Estimation Result with Selected Indicators of Economic Freedom and Additional Structural Indicators

Dependent Variable: GROW?
Method: Pooled Least Squares
Date: 12/08/02   Time: 11:05
Sample(adjusted): 1996 2000
Included observations: 5 after adjusting endpoints
Total panel observations 127
Cross sections without valid observations dropped

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R-squared 0.488892
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S.E. of regression 0.024221
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Prob(F-statistic) 0.00000
Mean dependent var 1.032233
S.D. dependent var 0.031221
Sum squared resid 0.062772
Durbin-Watson stat 1.852167
### Appendix 3. Final Estimation with Economic Freedom and Structural Indicators

Dependent Variable: GROW?
Method: Pooled Least Squares
Date: 12/08/02   Time: 15:28
Sample(adjusted): 1996 2000
Included observations: 5 after adjusting endpoints
Total panel observations 131

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