# COHESION POLICY INSTRUMENTS AND ECONOMIC GROWTH: DO INSTITUTIONS MATTER?

**Host, Alen; Zaninović, Vinko; Parat, Krešimir**

**Alen Host, PhD**

Associate Professor
Faculty of Economics Rijeka
E-mail: ahost@efri.hr

**Vinko Zaninović, PhD**

Postdoc
Faculty of Economics Rijeka
E-mail: vinko.zaninovic@efri.hr

**Krešimir Parat, MSc**

Department for Budget, Finance and Procurement
Primorje - Gorski Kotar County
E-mail: kresimir.parat@pgz.hr

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## *Abstract*

*The EU Cohesion policy is based on a complex system of fiscal transfers, their main goal being to accelerate economic and social cohesion. In this paper, the contributions of the Structural funds and Cohesion fund (SFCF) to economic growth on national level while controlling for the institutional quality are tested. Aim of the paper is show whether institutional quality is a bottleneck for effective usage of SFCF. The analysis is based on the country-level data during 2000-2013 period. In the presented econometric models, we emphasize the importance of the institutional quality on the economic growth. The results show that when Institutional Quality Indicator as a regressor is included together with the size of inflows from SFCF, SFCF inflows have no influence on economic growth. Moreover, we found that neither the institutional quality separately or in interaction with SFCF inflows, is a statistically significant factor for economic growth in the EU-27. The results are signifincantly different when we apply the same methodology on two subsamples, where we distinguish between countries with high and low level of institutional quality index.*

***Keywords: SFCF, institutional quality, economic growth, convergence***

# 1. INTRODUCTION

The purpose of the EU Cohesion policy is to promote and support the overall harmonious development of its Member States and regions. To be more precise, the EUs Cohesion policy aims to strengthen economic and social cohesion by reducing disparities in the level of development between regions. EU funds (hereinafter Structural funds and Cohesion fund (SFCF)) are instruments for achieving beforementioned aims. Although it is easy to express purpose and aims of the EU Cohesion policy and although the instruments of achieving its goals are well known, multitude of empirical tests of the casual effects of the Policy on country and regional economic growth and convergence resulted in ambiguous findings. EU funds are managed and delivered by European Commission, the Member States and different stakeholders at the regional and local level, so it is obvious that all these actors need to be coordinated and that the quality of instutions is of vital importance for successful and effective absorption of SFCF. This paper empirically tests the importance of SFCF on economic growth, while controlling for the institutional quality. Aim of the paper is show whether institutional quality is a bottleneck for effective usage of SFCF, effective usage being considered as significant positive effect of SFCF on economic growth. The results show that institution matter only when dividing the sample of countries according to the quality of institutions (high vs low level of institutional quality index), while results of the tests on the full sample (27 EU countries) showed that both SFCS and institutional quality indices are not significant variables for explaining the economic growth of EU member states.

The paper consists of five sections. After Introduction, second section includes literature review and theoretical framework for the research. Data and the applied methodology are presented in the third section. Fourth section contains the results of the estimated models and implications of it, while the fifth section concludes.

# 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK FOR THE RESEARCH

European Cohesian policy seems to be a puzzle for many researchers as consensus on the policy effectiveness does not exist. As if was mentioned in the previos section, many studies have tried to determine the effects of SFCF on economic growth and convergence, however most of the papers show ambiguous results. According to Pelegrinni et al. (2013), the reasons for the ambiguity are both data limitations and its comparability at regional level, and the struggle in separating the effects of the policy from the confounding effect of the other factors. Nonetheless, the increasing share of the EU budget devoted to Cohesian Policy require more profounded insights into the effects of the policy.

Important contribution to understanding the presented topic was given by Capellen et al. (2003) where they empirically test the impact of regional

support on economic growth and convergence. Their sample includes the data spanning 17 years, in the period from 1980 to 1997, for regions of seven EU member states (Belgium, Germany, Greece, Spain, France, Italy, Portugal and UK). The results0 of analysis suggest that SFCF have a significant and positive imapact on the European region's growth, thus contributing to higher equality in productivity and income in observed regions. However, the authors also emphasize that the economic impact of regional support is much stronger in more developed regions and that such support is essentially dependent on the absorbing capacities of the receiving regioons, thus implying that support is least efficient where is most needed.

Research conducted by Bouvet & Dall'Erba (2010), using SFCF data for each cohesion objective in the period from 1989 to 1993 and from 1994 to 1999 (first two programming periods), analyses which variables, economic and political, determine the actual funds allocation. Considering then existing literature, which stated that the economic characteristics of the recipient regions alone cannot explain the entire SFCF distribution, their paper focuses on elements that have a major role in the allocation process: political bargaining and additional funds. Their study comprises data for 120 NUTS 1 or NUTS 2 regions of 12 EU conutries. They use regions on both NUTS levels because NUTS 2 regions are not used as governmental units. Their results show that economic criteria are not the only determinants of funds allocation and that funds allocation is determined by political considerations. The results also suggest that the political situation within a country and a region and the relations between various layers of governance, determine the allocation process and that influences of national and regional political characteristics vary by cohesion objective.

Pellegrini et al. (2013) discuss that some econometric analyses show significant positive impact of Regional policy on economic growth and convergence while some papers suggest only conditionally-positive effects which depend on the quality of institutions such as research conducted by Enderveen et al. in 2002 and 2006. Our paper builds on their research.

Furthermore, Pellegrini et al. (2013) analyzed the effects of EU Regional policy but only for the regions with the GDP/pc below 75% of EU average (qualify for Objective 1 funds) in the period 1995 to 2006. The findings of their analysis suggest positive, but moderate effects on growth of the regions, indicating that GDP/pc on yearly average grows 0,8 percentage points more in treated regions than in not treated regions.

In the following section, economic growth model that is theoretical bedrock of our paper will be presented.

The neoclassical model of economic growth (Solow-Swan model) gave the starting point for a number of empirical studies of economic growth (Mankiw, Romer & Wiel, 1992; Levine & Renelt, 1992; Muslim, 1995; Barro & Sala-i-Martin, 2001) in an effort to explain the trends of economic growth and the factors that determine it.

A key aspect of the Solow-Swan's model is neoclassical form of production function that defines the level of production as a function of two main production factors, labor and capital, and which has the following main assumptions: yields on individual production factor are positive and decreasing, returns to scale are constant and there is a corresponding elasticity of substitution of production factors. The production function of this type, assuming a constant rate of savings, generates extremely simplified general equilibrium model of a closed economy, which assumes existance of a steady state in which the economy doesn't grow, i.e. according to Solow-Swan model, the growth is possible only in transition to steady state.

One implication of this model is the hypothesis of conditional convergence, which says that the countries that are currently at a lower level of economic development and which are distant from their steady state will achieve faster growth compared with the countries at a higher level of economic development. This property of the model is derived directly from the assumption of diminishing returns to capital. Economies with a lower level of capital per employee with respect to the long-term equilibrium level of capital per employee, achieve higher yields for an additional unit of capital and therefore have higher growth rates. This is so called conditional convergence, because the long-term stable level of capital equipment, labor and production per employee, depends on the rate of savings and investment, the growth of population and labor force and technology, which can vary from country to country. If we assume relatively homogenous group of countries where these variations are not as pronounced, the countries would converge around the same level of production per capita, i.e. these countries will achieve absolute convergence according to the Solow-Swan's model.

In addition, the model implies that without continuous technological progress, also because of diminishing returns to capital, the growth will eventually come to a halt. Long-term growth rate per capita in this type of models is not explained, because it is entirely determined by the rate of technological progress, which is exogenous. Therefore, as an alternative to the neoclassical growth model, different endogenous growth models that explain the nature of long-term economic growth within the model were developed.

Empirical analysis which will be carried out in this paper is conceptually similar to the analysis conducted by Ederveen et al. (2006) for a group of 13 countries of the European Union for the 1965-1990 period. Theoretical bedrock of their paper is Solow-Swan's model of economic growth expanded with the introduction of human capital (first paper which introduced human capital in this context si that of Mankiw et al. (1992). The base model assumes neoclassical production function of the following form:

$$Y_t = K_t^{\alpha} H_t^{\beta} (A_t L_t)^{1-\alpha-\beta} \quad (1)$$

where Y is the output level, K is physical capital, H is human capital, L is labor, and A denotes the level of technology. Due to the assumption of diminishing returns to capital, we have that $\alpha + \beta < 1$, $\alpha > 0$, $\beta > 0$. According to the assumptions of the model, growth of labor and technology is exogenously given (growth rate *n* for labor and *g* for technology respectively):

$$L_t = L_0 e^{nt} \tag{2a}$$

$$A_t = A_0 e^{gt} \tag{2b}$$

Thus, the effective quantity of labor $A_tL_t$ grows at a rate $n+g$.

The production function in (1) can be expressed in the following form

$$y_t = k_t^{\alpha} h_t^{\beta} \tag{3}$$

where all variables are expressed per unit of effective labor: y = Y/AL, k = K/AL, and h = H/AL. Assuming that a constant part of income is invested in both capital forms ($s_k$ denotes physical while $s_h$ human capital), the growth of physical and human capital can be described by the following equations:

$$\dot{k}_t = s_k y_t - (n + g + \delta)k_t \tag{4a}$$

$$\dot{h}_t = s_h y_t - (n + g + \delta)h_t \tag{4b}$$

where δ is the depreciation rate, which is same for physical and human capital.

From equations (4a) and (4b) we can show steady states of per unit physical and human capital with the following equations:

$$k^* = \left(\frac{s_k^{1-\beta} s_h^{\beta}}{n+g+\delta}\right)^{\frac{1}{1-\alpha-\beta}} \tag{5a}$$

$$h^* = \left(\frac{s_k^{\alpha} s_h^{1-\alpha}}{n+g+\delta}\right)^{\frac{1}{1-\alpha-\beta}} \tag{5b}$$

If we insert expressions (5a) and (5b) in equation (3) and then take the natural logarithm, we obtain the following expression:

$$\ln(y^*) = \frac{\alpha}{1-\alpha-\beta}\ln(s_k) + \frac{\beta}{1-\alpha-\beta}\ln(s_h) - \frac{\alpha+\beta}{1-\alpha-\beta}\ln(n + g + \delta) \tag{6}$$

Furthermore, the neoclassical model predicts convergence of economic growth. If the $y^*$ is equilibrium level of income per unit of effective labor and $y_t$ is its level in time t, we can approximate the speed of converegence near the steady state as:

$$\frac{d(ln(y_t))}{dt} = \lambda[ln(y^*) - ln(y_t)] \tag{7}$$

where $\lambda = (n + g + \delta)(1-\alpha-\beta)$. Equation (7) implies that:

$$ln(y_t) = \left(1 - e^{-\lambda t}\right) ln(y^*) + e^{-\lambda t} ln(y_0) \tag{8}$$

where $y_0$ is the level of income per unit of effective labor at the beginning of the observed period. Subtracting $\ln(y_0)$ from both sides and substituting the expression for $\ln(y^*)$, we obtain the following relation:

$$ln(y_t) - ln(y_0) = \left(1 - e^{-\lambda t}\right)\frac{\alpha}{1-\alpha-\beta}ln(s_k) + \left(1 - e^{-\lambda t}\right)\frac{\beta}{1-\alpha-\beta}ln(s_h) +$$

$$\left(1 - e^{-\lambda t}\right)\frac{\alpha+\beta}{1-\alpha-\beta}ln(n + g + \delta) - \left(1 - e^{-\lambda t}\right)ln(y_0) \quad (9)$$

Since the term on the LHS represents an approximation of the rate of growth of income per effective unit of labor, it follows that the growth rate is a function of the equilibrium level of income (of the rate of accumulation of physical and human capital and population growth plus of the rate of technological progress and the rate of depreciation) and the initial level of income per effective work.

Equation (9) is the basis for the following regression equation:

$$growth = \beta_0 + \beta_1 ln(y_0) + \beta_2 ln(s_k) + \beta_3 ln(s_h) + \beta_4 ln(n + g + \delta) + \varepsilon \quad (10)$$

Equation 10 was used for testing the assumptions of conditional convergence between different groups of countries in the 1960-1985 period using cross sections data (Mankiw et al., 1992), and longitudinal data (Islam, 1995). The existence of conditional convergence is confirmed if the parameter $\beta 1<0$.

Ederveen et al. (2006) were among the first who investigated the contribution of structural funds to economic growth of the EU countries on the country level data, using the conceptual framework from Mankiw. In their paper the growth regression, which is basically equation (10), is expanded with two additional independent variables:

$$growth = \beta_0 + \beta_1 ln(y_0) + \beta_2 ln(s_k) + \beta_3 ln(s_h) + \beta_4 ln(n + g + \delta) +$$

$$+\beta_5 lnSF + \beta_6 lnCONDSF + \varepsilon \quad (11)$$

where lnSF is the natural logarithm of the share of SFCF in the GDP and the lnSFCOND is the same as before, but this time in interaction with various measures of quality institutions. The model is evaluated on the panel data for 13 member countries and for the 7 five-year-periods from 1960 to 1995. Results of the analysis confirmed the existence of the economic growth convergence for the group of 13 member states, but also showed that structural funds do not have a positive effect on economic growth per se. Only in interactation with the importance of the institutional quality, SFCF have positive effect on GDP growth.

In this paper we build on the paper from Ederveen et al. (2006), but we modify the econometric model as will be explained more in the following chapter.

# 3. DATA AND THE METHODOLOGY

All the data used in our investigation was obtained from secondary sources as indicated in Table 1. We obtained the data for 27 EU member states for 2000-2013 period from the following sources:

Table 1

The input data for analysis

| Sign | Description | Source |
|---|---|---|
| $y$ | Real BDP per capita *(PPS*) | Eurostat |
| $s_k$ | Share of gross fixed capital investments in GDP | Eurostat |
| $s_h$ | Share of labor force with tertiary education level | Eurostat |
| *EUF* | SFCF funds resources | http://ec.europa.eu/regional_policy/en/policy/evaluations/data-for-research/ |
| *BDP* | BDP in current prices | Eurostat |
| *IQGE* | Government effectiveness indicator | World Governance Indicators |
| *IQRL* | Rule of law indicator | World Governance Indicators |

We point out that during the observed period some countries where not EU member states, but for those countries we included absorption of pre-accession funds (Instrument for Pre-accession Assistance) that are build on the same principles as the "standard" EU funds.

The estimated regression equation with all involved variables is the following:

$$growth_{i,t} = \beta_0 + \beta_1 ln(y)_{i,t-1} + \beta_2 ln(s_k)_{i,t} + \beta_3 ln(s_h)_{i,t} +$$

$$\beta_4 CRISES_{i,t} + \beta_5 ln(FUND)_{i,t} + \beta_6 IQ_{i,t} + \beta_7 ln(FUND\_IQ)_{i,t} + \varepsilon_{i,t} \quad (12)$$

wherein the index $i$ denotes country in the sample (i = 1, ..., 27), $t$ denotes the time (t = 2001, ..., 2013), while the variables are defined as follows:

The dependent variable *growth* expresses the real annual growth rate of GDP per capita (hereinafter GDPpc)

variable $ln(y)_{i,\ t-1}$ is the natural logarithm of the level of GDPpc in the previous year (t-1).

Variable $ln(sk)_{i,t}$ is the natural logarithm of the share of gross fixed capital formation in the GDP and is a proxy variable for the rate of accumulation of physical capital.

variable $ln(sh)_{i,t}$ is the natural logarithm of labor force with tertiary level of education in total labor force and is a proxy variable for human capital.

Variable $CRISES_{i,t}$ is a dummy variable with the value 1 for the (European debt) crisis years (from 2009 to 2013), 0 otherwise. We took this time span because, although some countries had prolonged crisis, this period is joint

denominator for crisis in practically all EU countries. Key independent variable in the model, ln(FUND), is expressed as the logarithm of the share of funds drawn from the structural and cohesion funds in the GDP (SFCF/GDP).

The institutional quality is included as an independent variable separately $(IQ)_{i,t}$ and in interaction with the absorption of EU funds, $ln(FUND\_IQ)_{i,t}$. There is no universal indicator that could be used and that can be said that it is the best measure of the institutional quality. A wide range of indicators, individually or collectively, may be a potential proxy for the institutional quality. Since the publication Worldwide Governance Indicators (WGI), which is from 1996 published annually by the World Bank, contains six indicators, we selected two that best fit the context of our analysis: Government effectiveness indicator - IQGE) and the Rule of law indicator - IQRL. Since the correlation between the two indices is very high (r = 0.94), we took their average as an unique indicator of the institutional quality.

Before performing regression analysis, and in order to examine the impact of cohesion policy instruments to economic growth of EU member states and the role of the institutional quality, we will first present the GDPpc dynamics for all Member States within the observed period.

Figure 1 shows GDPpc growth trends during 2000-2013 period, where we also differentiate between old (blue colored) and new EU member states (after 2004 and 2007 enlargement; red colored).

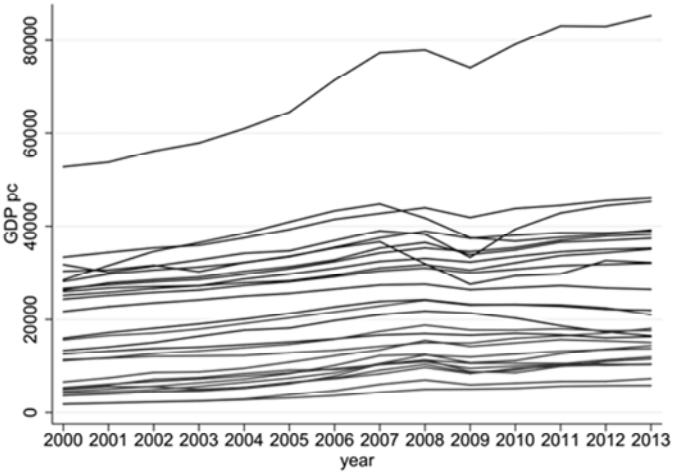


Figure 1: GDPpc growth for the old and new EU members

*Source: Authors' calculations*

After a period of stable growth (2000-2007) visible signs of crisis are noticeable in 2008, when there is a slowdown in growth in almost all countries, and when the majority of EU15 countries recorded a slight decline in GDPpc. However, the strongest impact of the crisis is visible in the year 2009, the year in which the level of GDPpc recorded substantial declines in all Member States (with Poland being

exception). From 2009 until 2013, the growth was on average lower when compared to the period before the crisis, and with considerable differences in the recovery trends of individual member states. While in most countries the recovery process began immediately after 2009, in some countries the impact of the crisis was prolonged (Cyprus, Greece, Spain recorded a negative growth rate after 2009). Very successful and speedy recovery and above average growth rates are observed in Lithuania, Latvia and Estonia.

Looking at the differences in GDPpc across member states, Luxembourg sticks out because it has roughly twice the level of GDPpc compared to EU15 average (and EU27 as well obviously). Throughout the entire period range, variation of GDPpc across member states is very large. GDPpc of old members states is at roughly two time bigger than the new member states, although in the observed period, some new member states (Cyprus, Malta, Czech Republic, Estonia) had greater GDPpc growth when compared with the least developed old member states (Greece and Portugal).

Table 2 contains of σ-convergence of GDP per capita for all countries of the EU.[1]

Table 2:

Results of σ-convergence

*EU27*

| year | sd |
|---|---|
| 2000 | .5631443 |
| 2001 | .5373824 |
| 2002 | .5147537 |
| 2003 | .487287 |
| 2004 | .472922 |
| 2005 | .4509342 |
| 2006 | .4353804 |
| 2007 | .4093853 |
| 2008 | .3838834 |
| 2009 | .3837897 |
| 2010 | .3806013 |
| 2011 | .3736378 |
| 2012 | .3601264 |
| 2013 | .3576203 |
| Total | .4572191 |

*EU27 w/o Luxembourg*

| year | sd |
|---|---|
| 2000 | .5271326 |
| 2001 | .5040517 |
| 2002 | .4792877 |
| 2003 | .4502265 |
| 2004 | .4331638 |
| 2005 | .4111637 |
| 2006 | .3883917 |
| 2007 | .3586946 |
| 2008 | .3315055 |
| 2009 | .3342691 |
| 2010 | .327819 |
| 2011 | .3151181 |
| 2012 | .3017069 |
| 2013 | .2956056 |
| Total | .4159484 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Source: Authors' calculations*

Results of σ-convergence show that the variation of the logarithm of GDPpc over the years is gradually reducing. This confirms the existence of the

[1] We calculated the standard deviation of the logarithm of GDP per capita for EU27 member states

convergence process of economic growth of the member states in the observed period.

The remainder of this paper is focused on the estimation and estimation results of pre-specified regression equation (12), which also examines the existence of, and the estimated speed of convergence (the concept of β-convergence). However, the primary task of this analysis is to determine whether the SFCF funds significantly contributed to the growth of all or maybe only one group of the EU member States, and whether the institutional quality affect the effectiveness of SFCF funds.

# 4. RESULTS AND DISCUSSION

In order to estimate equation (12) we choose between three estimators:

- pooled ordinary least squares estimator (POLS)
- fixed effects estimator (FE)
- random effects estimator (RE)

The choice of method was based on the results of the evaluation of the basic model with only the basic explanatory variables of the growth regression, which means that the regression equation (12) becomes:

$$growth_{i,t} = \beta_0 + \beta_1 ln(y)_{i,t-1} + \beta_2 ln(s_k)_{i,t} + \beta_3 ln(s_h)_{i,t} + \varepsilon_{i,t} \quad (13)$$

Since the POLS assumes that the variation between panel units is homogenous and that the estimated constant ($\beta_0$) is common to all panel units, it is very likely that the obtained estimates are biased. The reason for the biasness is in specific characteristics of individual economies, that is, because of individual, country-specific effects that affect economic growth and obviously vary across states but not vary with time.

By including individual effects on countries, regression equation is the following:

$$growth_{i,t} = \beta_0 + \beta_1 ln(y)_{i,t-1} + \beta_2 ln(s_k)_{i,t} + \beta_3 ln(s_h)_{i,t} + \alpha_i + \varepsilon_{i,t} \quad (14)$$

where the individual effects $\alpha_i$ can be considered in two ways: 1) as correlated with regressors (FE assumption) or 2) not correlated with regressors (RE assumption). So, the assumption of the strict exogeneity connected with RE model requires that there must be no correlation between individual effects and explanatory variables of the model. Moreover, not only that the assumptions between POLS and FE are different, but the mathematical derivation of both FE and RE with respect to POLS differ. Namely, FE estimator uses demeaning of the variables, while RE does quasi-demeaning, since it uses parameter theta that multiplies the mean values of the respective variables. Technical details behind calculations are discusess in Baltagi (2005).

Obviously, due to the differences in calculation, the results between POLS and RE on one side and FE on other will vary. FE model shows that the speed of the convergence process is far higher than that indicated by the POLS model. The effects of both physical and human capital to growth are positive and significant.

The results of the estimations of the equation 14 using POLS, FE and RE estimators are shown in the Table 3.

Table 3

Results of the estimation of equation 14

| | (1) | (2) | (3) |
|---|---|---|---|
| | POLS | FE | RE |
| VARIABLES | Growth | Growth | Growth |
| | | | |
| lnY | | | |
| L1 | -.0435461 | -.1896388*** | -.0473567*** |
| | (.0058656) | (.0205955) | (.0068331) |
| lnSK | .0058656 | .1619755*** | .0866243*** |
| | (.0140604) | (.019358) | (.0149171) |
| lnSH | .0067252 | .1178933*** | .0072809 |
| | (.006976) | (.0235748) | (.0081628) |
| Constant | .198612 | 1.047983*** | .2138725** |
| | (.0773532) | (.1511131) | (.0849963) |
| Observations | 351 | 351 | 351 |
| R-squared | 0.2746 | 0.3240 | 0.2598 |
| Number of id | 27 | 27 | 27 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
*Source: Authors' calculations*

Estimated parameters in all cases have expected sign. For POLS estimation, the estimated convergence coefficient (-0.0435) has a negative sign, and the coefficient of investment rates (0.0799) positive, and both are statistically significant. However, surprisingly, the human capital shows insignificant for economic growth of the EU countries.

Sign and values of the parameters obtained from after POLs and RE estimations are rougly the same, but since it is plausible to assume heterogeneity between panel units (countries), main candidates for further testing of the main hypothesis of the paper are RE and FE. A decision on whether the RE model is acceptable in relation to the FE model was made after applying the Hausman test, the results of which are presented in Table 4. The hypothesis of the independence of the individual effects and other regressors is rejected, and we concluded that the parameters after aplying RE estimator are not consistent, which in turn indicates that the FE is a suitable one for further analysis. Given that according to tests the best choice for conducting the analysis model FE, it will be used for the rest of the analysis.

Table 4

Results of the Hausman test

| | (b) | (B) | (b-B) |
|---|---|---|---|
| | FE | RE | Difference |
| lnY | | | |
| L1. | -.1896388 | -.0473567 | -.1422821 |
| lnSK | .1619755 | .0866243 | .0753512 |
| lnSH | .1178933 | .0072809 | .1106125 |
| chi2(3) | 68.71 | | |
| Prob>chi2 | 0 | | |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
*Source: Authors' calculations*

## 4.1. Results for all member states

For further analysis, the basic FE model was expanded with additional explanatory variables. We estimated the equation 12 with all variables included as well as with stepwise inclusion of additional variables in order to check how the estimates change as we add additional variables. Results for the whole sample of 27 members (EU-27) are shown in Table 5.[2]

Table 5

Results of the estimation of equation 12 for EU27

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| VARIABLES | Growth | Growth | Growth | Growth | Growth |
| | | | | | |
| L.lnY | -0.165*** | -0.192*** | -0.195*** | -0.175*** | -0.184*** |
| | (-7.77) | (-6.96) | (-6.60) | (-6.92) | (-6.97) |
| lnSK | 0.121*** | 0.133*** | 0.132*** | 0.122*** | 0.131*** |
| | (5.80) | (5.91) | (5.91) | (5.61) | (5.68) |
| lnSH | 0.147*** | 0.146*** | 0.150*** | 0.154*** | 0.145*** |
| | (5.96) | (6.44) | (5.74) | (5.54) | (6.24) |
| Cruise | -0.0269*** | -0.0254*** | -0.0251*** | -0.0261*** | -0.0255*** |
| | (-4.33) | (-3.98) | (-3.78) | (-3.95) | (-3.95) |
| lnFUND | | 0.0210 | 0.0182 | | |
| | | (1.99) | (1.66) | | |
| IQ | | | 0.0170 | 0.0268 | |
| | | | (0.74) | (1.25) | |
| LnFUND_IQ | | | | | 0.00921 |
| | | | | | (1.80) |
| Constant included | YES | YES | YES | YES | YES |
| Observations | 351 | 351 | 351 | 351 | 351 |
| R-squared | 0.343 | 0.348 | 0.348 | 0.345 | 0.347 |
| Number of id | 27 | 27 | 27 | 27 | 27 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
*Source: Authors' calculations*

[2] Results are based on the corrected standard errors robust to autocorrelation and heteroskedasticity.

As expected, the crisis has significantly reduced the annual growth rate of the EU countries (on average by about 2.6% lower than in the period before the crisis). Rates of physical and human capital have the expected positive impact on economic growth and are statistically significant and negative and statistically significant value assessment parameter to the level of initial income confirms the existence of convergence of the economic growth of member countries. Models which are in various ways involved variable intensity withdrawals structural and cohesion funds and the level of institutional quality (columns 2-5) shows that neither the share of funds in the GDP and the institutional quality separately (columns 2-4), nor interact (column 5) were not statistically significant economic growth factors for EU27 as a whole.

## 4.2. Results for EU15 and NMS12

EU member state make very heterogeneous group of countries and it is possible to make the assessment of previous regressions on two separate samples, one sample including the EU15 countries and second one including NMS12 (New Member States, that is EU member states after 2004 and 2007).

Table 6 shows the results obtained for the EU15 sample.

Table 6

Results of the estimation of equation 12 for EU15

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | | | | |
| VARIABLES | Growth | Growth | Growth | Growth | Growth |
| | | | | | |
| L.lnY | -0.245*** | -0.243*** | -0.249*** | -0.251*** | -0.241*** |
| | (-4.47) | (-4.49) | (-4.78) | (-4.70) | (-4.47) |
| lnSK | 0.107* | 0.111** | 0.116** | 0.111** | 0.109* |
| | (2.92) | (2.99) | (3.36) | (3.23) | (2.97) |
| lnSH | 0.147** | 0.144** | 0.141** | 0.144** | 0.144** |
| | (3.75) | (3.74) | (3.52) | (3.56) | (3.70) |
| Cruise | -0.0181* | -0.0170* | -0.0165* | -0.0178* | -0.0170* |
| | (-2.80) | (-2.51) | (-2.66) | (-2.89) | (-2.55) |
| lnFUND | | 0.0188 | 0.0219 | | |
| | | (1.17) | (1.48) | | |
| IQ | | | -0.0204 | -0.0177 | |
| | | | (-0.81) | (-0.76) | |
| LnFUND_IQ | | | | | 0.0117 |
| | | | | | (1.12) |
| Constant included | YES | YES | YES | YES | YES |
| | | | | | |
| Observations | 351 | 351 | 351 | 351 | 351 |
| R-squared | | | | | |
| Number of id | 15 | 15 | 15 | 15 | 15 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
*Source: Authors' calculations*

Results are actually similar to those obtained for the entire sample EU27. Statistically significant are the parameters that confirm the existence of convergence, the contribution of investment in physical and human capital, and the impact of the crisis, while EU funds and the institutional quality again have no statistically significant effect. There are no major changes in the size of the estimates of the parameters, except for the coefficient of convergence that for this sample shows much faster convergence of GDP per capita in relation to the group EU27.

Table 7 contains results for the group NMS12 and does not show significantly different results. SFCF resources again do not have a statistically significant impact on the economic growth; convergence exists, but the countries converge much slower compared to the EU15, while the impact of the crisis on the reduction of the rate of growth has been stronger.

Table 7

Results of the estimation of equation 12 for EU12

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | | | | |
| VARIABLES | Growth | Growth | Growth | Growth | Growth |
| | | | | | |
| L.lnY | -0.150*** | -0.174*** | -0.197** | -0.168** | -0.164*** |
| | (-5.05) | (-4.82) | (-3.97) | (-3.95) | (-4.58) |
| lnSK | 0.128** | 0.137** | 0.143** | 0.133** | 0.137** |
| | (4.00) | (4.00) | (3.64) | (3.64) | (3.67) |
| lnSH | 0.170*** | 0.153** | 0.153** | 0.171*** | 0.153** |
| | (4.74) | (4.09) | (3.97) | (4.66) | (4.16) |
| Cruise | -0.0382* | -0.0423* | -0.0404* | -0.0361* | -0.0402* |
| | (-2.59) | (-2.83) | (-2.44) | (-2.21) | (-2.77) |
| lnFUND | | 0.0264 | 0.0290 | | |
| | | (1.32) | (1.38) | | |
| IQ | | | 0.0517 | 0.0470 | |
| | | | (1.45) | (1.22) | |
| LnFUND_IQ | | | | | 0.0103 |
| | | | | | (1.36) |
| Constant included | YES | YES | YES | YES | YES |
| R-squared | 0.405 | 0.408 | 0.412 | 0.408 | 0.405 |
| Observations | 156 | 156 | 156 | 156 | 156 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
*Source: Authors' calculations*

## 4.3. Results for countries with different institutions quality index (high vs low)

Additional analysis was performed, but on different subsamples. This time, within subsamples we had more homogenous groups of countries, that is countries with similar level of the institutional quality. More specifically, we ranked all EU27 Member States with regard to the value of the variable IQ and the first sample comprised 10 countries with the highest values, while the second

sample compired 10 countries with the lowest values.[3] The results of the estimaton for the 10 highest ranked countries in terms of the institutional quality indicate very different results compared to the previously evaluated regressions and are shown in Table 8.

Table 8

Results of the estimation of equation 12 for MS with the highest institution quality

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | | | | |
| VARIABLES | Growth | Growth | Growth | Growth | Growth |
| | | | | | |
| L.lnY | -0.191* | -0.186** | -0.193** | -0.204** | -0.185** |
| | (-3.06) | (-3.36) | (-4.12) | (-3.44) | (-3.32) |
| lnSK | 0.0362 | 0.00586 | 0.0111 | 0.0438 | 0.00590 |
| | (0.59) | (0.10) | (0.24) | (0.83) | (0.10) |
| lnSH | 0.109* | 0.118* | 0.117 | 0.106* | 0.118* |
| | (3.03) | (2.32) | (2.22) | (2.94) | (2.30) |
| Cruise | -0.0181 | -0.0168* | -0.0164* | -0.0173 | -0.0164* |
| | (-1.82) | (-2.43) | (-2.70) | (-1.98) | (-2.38) |
| lnFUND | | 0.208*** | 0.200*** | | |
| | | (7.94) | (7.70) | | |
| IQ | | | -0.0256 | -0.0484 | |
| | | | (-0.52) | (-1.08) | |
| LnFUND_IQ | | | | | 0.0805*** |
| | | | | | (9.23) |
| Constant included | YES | YES | YES | YES | YES |
| R-squared | 0.154 | 0.189 | 0.184 | 0.153 | 0.191 |
| Observations | 130 | 130 | 130 | 130 | 130 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Source: Authors' calculations*

The contribution of EU funds to the economic growth is positive and has a very high statistical significance, while the investment rate is no longer statistically significant contribuent to economic growth. The institutional quality taken separately as an explanatory variable is insignificant, which is perhaps to be expected given the previous results. However, a very important difference in the significance of parameter that measures the impact of EU funds is noticed for countries with high values of IQ. This could mean that the institutional quality is a requirement for the effective apsorption of EU funds in terms of the impact on the economic growth rate. Countries that have not reached the appropriate level of institutional quality, according to the results of analysis, can not expect a positive impact of Cohesion policy instruments to economic growth if the level of

[3] A group of ten highest-ranked countries in terms of the institutional quality comprised of following: Finland, Denmark, Sweden, Austria, the Netherlands, Luxembourg, UK, Germany, Ireland and Belgium. A group of ten countries ranked lowest in the institutional quality were: Romania, Bulgaria, Italy, Poland, Latvia, Slovakia, Lithuania, Greece, Hungary and the Czech Republic.

institutional quality doesn't reach an adequate level. This confirms the correctness of the approach of the EU when it comes to pre-accession funds, where a significant portion of pre-accession assistance to candidate countries is focused on transition assistance and institution building.

Table 9

Results of the estimation of equation 12 for MS with the lowest institution quality

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | | | | |
| VARIABLES | Growth | Growth | Growth | Growth | Growth |
| | | | | | |
| L.lnY | -0.176** | -0.198** | -0.230** | -0.213** | -0.188** |
| | (-4.15) | (-4.24) | (-3.68) | (-3.48) | (-4.05) |
| lnSK | 0.141** | 0.147** | 0.154** | 0.149** | 0.145** |
| | (4.03) | (4.19) | (3.77) | (3.72) | (4.06) |
| lnSH | 0.217** | 0.198** | 0.222** | 0.239** | 0.198** |
| | (4.21) | (3.84) | (3.47) | (3.96) | (3.88) |
| Cruise | -0.0417* | -0.0432** | -0.0387* | -0.0372* | -0.0418** |
| | (-3.16) | (-3.45) | (-2.96) | (-2.75) | (-3.29) |
| lnFUND | | 0.0243 | 0.0209 | | |
| | | (1.19) | (0.97) | | |
| IQ | | | 0.0670 | 0.0701 | |
| | | | (2.05) | (2.15) | |
| LnFUND_IQ | | | | | 0.0103 |
| | | | | | (1.14) |
| Constant included | YES | YES | YES | YES | YES |
| R-squared | 0.433 | 0.436 | 0.451 | 0.450 | 0.433 |
| Observations | 130 | 130 | 130 | 130 | 130 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Source: Authors' calculations*

Table 9 shows the results for the ten member states with the lowest level of the institutional quality. The results show quite a big difference compared to the previous results for countries with high institutional quality. Coefficient of SFCF funds is no longer statistically significant in this case. The variable institutional quality, although not significant according to the standard criteria (5%), is significant with a significance level at 10% and has a positive sign. If we consider changes in this parameter in comparison with previous sample, we argue that the results indicatate that at a lower level of institutional development, the focus of the policy makers should be on improving the quality of the institutions, which initially already provides opportunities for potentially higher growth rates for the economy. When the institutional quality reaches a sufficiently high level, absorption of EU funds should improve, which will in turn lead to higher growth rates.

Obviously, our research has couple of limitations, first being that the objects of the analysis, that is, panel units, were countries, while regions are the

most important unit in the context of Cohesion policy. The reason for choosing country level analysis was lack of availability of data at the regional level for all EU countries. Moreover, one has always need to have in mind the technical issues regarding institutional quality measurements.

## 5. CONCLUSIONS

Results of the analysis indicate that the contribution of the SFCF funds to the economic growth is significant only in those countries where the institutional quality is at the high level. These results are in the favor of critics of the Cohesion Policy and its instruments, who claim that that policy has not reached its full potential and that for the most part, only serves as a redistributive mechanism of transfers from richer to poorer countries without the real impact on the economic growth and the convergence process. However, the results indicate that the countries with the low institutional quality could have a positive impact on economic growth if they improve the institutional quality.

Since the analysis confirmed the convergence of economic growth of EU member states, and that the contribution of SFCF funds to economic growth was only evident in countries with higher quality institutions, which are generally at higher level of economic development, it seems that the forces of economic integration are stronger than the impact of the Cohesion policy instruments.

Beforementioned facts lead to the conclusion that investing in the development and improvement of the institutional quality of the EU member states with lower quality is desirable, especially due to the fact that in the first phase, such investments will have a direct positive impact on economic growth. When the institutional quality of a particular Member State reaches a satisfactory level, then the SFCF funds will begin to contribute to the economic growth. In this sense, one can consider the development of specific instruments of Cohesion policy which would further emphasize the former practice of strengthening institutional capacity, or increase the institutional quality, with the aim of increasing the impact of SFCF funds. Finally, the limitations of our research, as mentioned in previous section, could serve as starting points in future work on this research topic.

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***Dr. sc. Alen Host***

Izvanredni profesor
Ekonomski fakultet u Rijeci
E-mail: ahost@efri.hr

***Dr. sc. Vinko Zaninović***

Postdoktorand
Ekonomski fakultet u Rijeci
E-mail: vinko.zaninovic@efri.hr

***Mr. sc. Krešimir Parat***

Upravni odjel za proračun, financije i nabavu
Primorsko-goranska županija
E-mail: kresimir.parat@pgz.hr

# INSTRUMENTI KOHEZIJSKE POLITIKE I EKONOMSKI RAST: JESU LI INSTITUCIJE VAŽNE?

## *Sažetak*

*Kohezijska politika Europske unije predstavlja složen sustav fiskalnih transfera kojima se želi ubrzati ekonomska i socijalna kohezija. U ovom radu provedeno je empirijsko istraživanje na temelju ocjenjivanja više regresijskih jednadžbi ekonomskog rasta s ciljem utvrđivanja doprinosa Kohezijskog i strukturnih fondova ekonomskom rastu zemalja članica EU u razdoblju od 2000. do 2013. godine. Za nezavisnu varijablu, između ostalih, odabran je indeks kvalitete institucija. Rezultati analize na cjelokupnom uzorku zemalja ukazuju na to da, iako se potvrđuje postojanje konvergencije, strukturni i Kohezijski fond nemaju utjecaj na ekonomski rast. Jednako tako, utvrđeno je da kvaliteta institucija zasebno, niti u interakciji sa sredstvima strukturnih i Kohezijskog fonda nije statistički značajan čimbenik ekonomskog rasta u skupini EU27, ali se rezultati značajno mijenjaju ako se osnovni uzorak razdvoji na zemlje s visokom i niskom razinom kvalitete institucija.*

***Ključne riječi: SFCF, institutional quality, economic growth, convergence***

***JEL klasifikacija: E02, O43***