African Journal of Business Management Vol. 5(7), pp. 2590-2596, 4 April, 2011
Available online at http://www.academicjournals.org/AJBM
DOI: 10.5897/AJBM10.686
ISSN 1993-8233 ©2011 Academic Journals

Full Length Research Paper

Institutions and economic growth: A study in a cross-section of countries

Hakan Sarıbas

Faculty of Economics and Administrative Sciences, Zonguldak Karaelmas University, 67100-Zonguldak, Turkey.
E-mail: hakan203@yahoo.com. Tel: 90-372-257-4010 (1142), 90-532-302-4467. Fax: 90-372-257-4057.

Accepted 20 August, 2010

The neoclassical prediction, which is that lower income countries tend to grow faster than the high income countries, is often found to be inconsistent with the empirical research results. Researchers argue that neoclassical hypothesis holds merely when countries are similar with respect to structural parameters for preferences, hence institutions, and technology. If this similarity dissolves, no convergence should be expected between poor and rich countries. As countries tend to become more similar in institutional climate, faster growth should emerge. In this work, we endeavor to examine the relationships between economic growth and institutional variables such as overall economic freedom as well as its components. Having introduced a formal model, we found that the growth rate of real per capita GDP was positively associated with overall economic freedom, government size, fiscal freedom and trade freedom for a sample of countries in the period 1995 to 2008. Other components of economic freedom in the Heritage index were not significantly related to economic growth. We also found that growth was unrelated to Socialism and to Weberian thesis. Finally, customary variables, which are level of real per capita GDP, initial human capital, physical capital and population, were also found to be significant.

Key words: Growth, economic freedom, heritage index, ınstitutions.

INTRODUCTION

Poverty remains the most important economic problem of the world and the poor lives overwhelmingly in the developing countries. Less developed contries continuously strive to improve the conditions of the poor by having an enviromentally and socialy sustainable growth rates. Almost half of the world population earns less than 2,5$ per day and at least 80% of the world population lives on less than 10$ below the poverty line. On the other hand, proportion of the poor living below the poverty line has fallen from 52 to 25% in last three decades. Human welfare has been constantly increasing and the absolute number of the poor has been declining since 1980 (WDR, 2003).

In spite of this success, cathing up with rich countries poses another challenge for the developing world. Income differential between rich and poor countries are widening due to relative low growth rates in less developed countries. From 1870 to 1990, the ratio of per capita incomes between the richest and the poorest countries had increased to five fold. (Pritched 1997; p.1). The average income of the richest 20 is 37 times greater than the income of the poorest 20, and this ratio has doubled in the past four decades (WDR, 2003: 2).

Absolute convergence was not a key result from the empirical works because the growth rates between developed and developing countries diverge immensely in the long run. Empirical literature indicates that divergence between the industrilized and the developing countries has been the main characteristic of the world (Pritched, 1997: 14).

In this paper, we aim to test the effect of overall economic freedom on growth, and to identify what specific components of economic freedom drive more growth after developing a formal model explaining the effect of institutional variable on growth. The statistical effects of Islamic Culture and Socialism on growth are also examined. We found that the growth rate of real per capita GDP is positively associated with overall economic

JEL: O43, O41, E02, C31.

freedom, government size, fiscal freedom and trade freedom for a sample of countries in the period 1995 to 2008 (Appendix 3). Other components of economic freedom in the Heritage index are not significantly related to economic growth. We also found that growth is unrelated to Socialism and to Weberian thesis. Finally, customary variables, which are level of real per capita GDP, initial human capital, physical capital and population, are also found to be significant.

Theoretical overview

The neoclassical growth theory has generally focused on the role of physical resources (capital, labor and land) and human capital to attain a higher level of growth rate. It predicts that there should be a conditional convergence across countries in the very long run, meaning that countries have similar steady-state levels. However, differences in saving rates, population growth rates, and the position of the production functions produce different steady-state levels, implying that if there are differences in structural preferences, countries approach different steady-state levels, hence no convergence between the poor and the rich is supposed to occur.

It is important to note that neoclassical theory does not explain why countries have different steady-state levels. It merely intends to explain efficient resource allocation in the developed economies and is known to be a theory of a frictionless world and to deal with its issues timelessly. In neoclassical theory, decision makers instantly and costlessly obtain and process all information relevant to trade, hence, frictions such as strikes, boycotts and sit-ins do not exist. Contracts are complete in the sense that monitoring and enforcing the contracts are caried at absolute precision. All transactions are costless and, therefore, institutions do not exist in the neoclassical frictionless world (North, 2003:1) and (North 1989: 1319).

The new institutional economics extends the neoclassical theory and argues that the real life has full of uncertainities and people respond incentives and disincentives. Institutions preclude the well being of human kind should they not be growth promoting. So, the ultimate sources of income differences across countries are not poor technology and poor capital accumulation; rather, they are the institutional and cultural differences among countries, which initialy causes poor technology and poor capital accumulation (North, 1989: 1319-20) and (Acemoğlu, 2008: 123-26).[1]

The model

One of the fundemantal lessons that we have learned from the economic growth literature is that institutions matter in the process of economic well-being. Modelling the effects of institutions on growth has been still in development because the term of institutions incorporates the vast varieties being formal and informal. As for modelling, a particular suggestion is noteworthy here:

> 'Institutions affect the 'efficiency' of an economy much in the same way as technology does: an economy with bad institutions is more inefficient in the sense that it takes more inputs to produce the same amount of output. In addition, bad institutions lower incentives to invest (in physical and human capital as well as technology) and to work and produce.' (Sala-i Martin, 2002: 17).

A typical institutional variable on growth can be a Harrod-neutral progress, which is labor-augmenting and completely detached from the production factor, K (capital). The main characteristics of institutions that separates it from other expalanations of growth such as culture, luck and geography hypotheses is that they are based on social and individual choices (Acemoglu, 2008: 126). Detaching the institutional variable from capital or identiying it as a Harrod-neutral progress emanates from the fact that institutions are merely attached to human choices. The neoclassical production function is:

$$Y = Y[K, E(t) \cdot L] \quad (1)$$

where Y, K and L are output, capital and labor, respectively (Chiang, 1992: 265-67). E(t) represents institutional efficency variable, indicating labor augmenting Harrod-neutral progress. Production function is linearly homogeneous in productive factors. The institutional efficiency of labor, ε, and the production function can be stated as

$$\begin{aligned} \varepsilon &\equiv E(t) \cdot L \\ Y &= Y(K, \varepsilon) \end{aligned} \quad (2)$$

By the assumption of linear homogeneity, the production function becomes

$$y_\varepsilon = \psi(k_\varepsilon) \quad (3)$$

Where, $y_\varepsilon = \frac{Y}{\varepsilon}$ and $k_\varepsilon = \frac{K}{\varepsilon}$.

The usual assumptions of the neoclassical production function also applies

$$\psi'(k_\varepsilon) > 0 \text{ and } \psi''(k_\varepsilon) < 0 \text{ for all } k_\varepsilon. \quad (4)$$

$$\lim_{k_\varepsilon \to 0} \psi'(k_\varepsilon) = \infty \text{ and } \lim_{k_\varepsilon \to \infty} \psi'(k_\varepsilon) = 0.$$

Becuase the total output consists of consumption (C) and gross incestment (I_{gross}), net investment, $I_{net} = \dot{K}$, can be written as $\dot{K} = I_{gross} - \delta K = Y - C - \delta K$

where $\delta =$ depreciation rate. Dividing through by the institutional efficiency, we have:

[1] In dealing with income divergence, there are other perspectives such as multiple equlibria (luck) and culture views (Acemoglu, 2008: 123-24).

$$\frac{1}{\varepsilon}\dot{K} = y_\varepsilon - c_\varepsilon - \delta k_\varepsilon = \psi(k_\varepsilon) - c_\varepsilon - \delta k_\varepsilon \quad (5)$$

where $c_\varepsilon = \frac{C}{\varepsilon}$.

After solving the last equation to unify both sides in per institutional efficiency, we get

$$\dot{k}_\varepsilon = \psi(k_\varepsilon) - c_\varepsilon - (i_g + n + \delta)\cdot k_\varepsilon \quad (6)$$

where $i_g = \frac{\dot{E}}{E}$ and $n = \frac{\dot{L}}{L}$

The optimal control problem can be contructed in the following way

$$\begin{aligned} &Maximize \quad \int_0^\infty U(c_\varepsilon)\cdot e^{-rt}dt \\ &subject\ to \quad \dot{k}_\varepsilon = \psi(t) - c_\varepsilon - (i_g + n + \delta)\cdot k_\varepsilon \\ &\qquad\quad k_\varepsilon(0) = k_{\varepsilon 0} \\ &and \qquad\quad 0 < c_\varepsilon < \psi(k_\varepsilon) \end{aligned} \quad (7)$$

The current value Hamiltonian function is defined as

$$H = U(c_\varepsilon)\cdot e^{-rt} + \lambda\cdot[(\psi(k_\varepsilon) - c_\varepsilon - (i_g + n + \delta)\cdot k_\varepsilon] \quad (8)$$

λ is the current value costate variable. The necessary conditions are

$$\begin{aligned} &\frac{\partial H}{\partial c_\varepsilon} = U'(c_\varepsilon)\cdot e^{-rt} - \lambda = 0 \\ &\qquad U'(c_\varepsilon) = \lambda\cdot e^{rt} \\ &\dot{\lambda} = -\frac{\partial H}{\partial k_\varepsilon} = -\lambda\cdot[\psi'(k_\varepsilon) - (i_g + n + \delta)] \\ &\dot{k}_\varepsilon = \frac{\partial H}{\partial \lambda} = \psi(k_\varepsilon) - c_\varepsilon - (i_g + n + \delta)\cdot k_\varepsilon \end{aligned} \quad (9)$$

After solving the above equations, we get the following pair of differential equations

$$\begin{aligned} &c_\varepsilon = \psi(k_\varepsilon) - (i_g + n + \delta)\cdot k_\varepsilon \\ &\psi'(k_\varepsilon) = i_g + n + \delta + r \end{aligned} \quad (10)$$

The above differential equations are the equations where $\dot{k}_\varepsilon = 0$ and $\dot{c}_\varepsilon = 0$. In this steady state level, variables, Y, K and ε, all grow at the same rate. Note that consumption per institutional efficiency is constant. As long as institutional efficiency increses, per-capita consumption rises over time. Formally,

$$\begin{aligned} &c_\varepsilon = \frac{C}{\varepsilon} = \frac{C}{E(t)\cdot L} \\ &\frac{C}{L} = c_\varepsilon \cdot E(t) \end{aligned} \quad (11)$$

Usual phase diagram applies and can be constructed here. The model suggests that increases in Harrod-neutral institutional efficiency improve the well-being of a nation.[2]

RESULTS

The theory of market institutions has been continuously tested in the literature only after the appropriate data about economic freedom had become available for the researchers.[3] There are two major strands in testing the relationship between economic growth and economic freedom: one focuses on the effect of aggregate index and the other one focuses on the separate effects of individual components of economic freedom.

The methodology using the aggregate index, the level of economic freedom or the change in economic freedom is generally used as an explanatory variable in the growth regression. Studies such as (Islam, 1996) and (Easton and Walker, 1997) use only either the aggregate level of economic freedom or the change in economic freedom. Others such as (Weede and Kampf, 2002), (Gwartney et al., 2004) and (Doucouliagos and Ulubaşoğlu, 2006) use both variables in the representative growth regression. All found that there is a significant positive relationship between growth and EF.

From these studies, we are able to say that EF and change in EF have a positive association with per capita growth rate. It is important to note that all these studies above used Fraser Index as a measure of economic freedom, and standard linear regression model OLS. Therefore, causality from EF to growth is assumed.

Because aggregate EF index is the average of individual freedom components, it is interesting to see whether all elements in the EF index are robustly and positively related to economic growth. (Ayal and Karras, 1998) looked at the effects of individual EF components on growth rate. They concluded that the seven out of thirteen categories are positively and significantly related to growth. (Heckelman and Stroup, 2000) employed fourteen individual components of EF and found that only four of them have a positive and significant relationship to

[2]To get more information about optimal control theory and phase diagrams see (Chiang, 1992).

[3]Saribas (2009) has a similar empirical review. See Capolupo (2009) for a through review of the empirical literature.

Table 1. Results from cross-section regressions for growth.

	(1)	(2)	(3)	(4)	(5)	(6)
CONST	-0.547	2.322	1.434	1.064	1.432	1.292
	(0.63)	(1.76)	(1.22)	(0.50)	(1.20)	(1.23)
GDP95	-6.8E-05	-6.3E-06	-8.5E-05	-8.9E-05	-8.5E-05	-4.6E-05
	(1.43)	(0.15)	(1.75)	(1.71)	(1.72)	(1.36)
CAPITAL	0.191	0.105	0.144	0.143	0.144	0.156
	(6.20)	(2.66)	(4.44)	(4.38)	(4.41)	(4.80)
POPGR	-0.401	-0.894	-0.73	-0.726	-0.732	-0.559
	(2.082)	(4.42)	(3.12)	(3.08)	(2.88)	(3.22)
PRIM95		-0.006	-0.018	-0.185	-0.018	-0.022
		(0.65)	(1.93)	(1.91)	(1.81)	(3.07)
SEC95			0.022	0.020	0.022	0.022
			(1.96)	(1.57)	(1.88)	(3.10)
LIFE				0.008		
				(0.21)		
MUSLIM					0.009	
					(0.02)	
SOC						-0.772
						(1.64)
No. Of obs.	143	106	100	100	100	94
R^2	0.27	0.26	0.46	0.46	0.46	0.50

growth. (Carlsson and Lundström, 2002) studied seven EF components and reported that two components are significantly related to growth, but one has a positive, another one has a negative effect on growth. They showed that growth rate decreases as household increasingly engage trade with foreigners. (Berggren and Jordahl, 2005) investigated the finding of (Carlsson and Lundström, 2002) and reported that taxes on international trade derive this result. (Justesen, 2008) conducted Granger-Causality tests between the different EF categories and growth as well as investment. Justesen reports two out of five individual component of EF can be said to Granger-cause growth and investment.

Empirical studies above show that categories of EF have different effect on growth and investment. OLS, EBA (Extreme Bound Analysis), LTS (Least Trimmed Squares) and Granger-causality tests are the usual methods to identify the true effects of EF on growth.

Our cross-section model has 181 countries over the period 1995 to 2008. We excluded high income OECD countries from the sample and assumed that the coefficients on the GDP terms are restricted to be the same across all remaining countries. The level of EF and its components are from the Index of the Heritage Foundation. Other variables have been taken from the World Development Indicators.

The Heritage Foundation measures the level of economic freedom in each country. In their annually published Index of Economic freedom, they identify the 10 categories of economic freedom, and these 10 specific economic freedoms are individually scored. However, a country's general economic freedom score is an average of its scores on the 10 individual freedoms (Miller and Holmes, 2009: 12). Appendixes 1 and 2 summaries and lists definitions of all the variables used in the following regressions. Cross-section regression model for per capita growth can formally be represented as follows:

$$Growth = \alpha + \beta_1 GDP95 + \beta_2 INV + \beta_3 POPGR + \beta_4 PRIM95 + \beta_5 SEC95 + \beta_6 ECONF + \mu$$

Based on this model, series of regressions have been run and their results are reported in Tables 1 and 2. In Table 1, dummy variables for Muslim countries and Socialist countries are not associated with per capita GDP growth

Table 2. Results from cross-section regressions for growth.

	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CONST	-2.298	-0.629	0.256	-0.010	-1.422	-0.628	-1.046	0.275	1.921	1.245
	(1.26)	(0.43)	(0.19)	(0.007)	(1.05)	(0.41)	(0.70)	(0.17)	(1.41)	(1.00)
GDP95	-0.0001	-0.0001	-0.0001	-0.0001	-9.3E-05	-0.0001	-0.0001	-0.0001	-6.9E-05	-8.8E-05
	(3.03)	(2.71)	(2.27)	(2.43)	(1.98)	(2.40)	(2.54)	(2.28)	(1.20)	(1.43)
CAPITAL	0.171	0.179	0.161	0.173	0.163	0.168	0.176	0.163	0.159	0.167
	(5.48)	(5.56)	(5.03)	(5.31)	(5.40)	(5.32)	(5.59)	(5.07)	(4.95)	(5.13)
POPGR	-0.384	-0.32	-0.523	-0.388	-0.60	-0.494	-0.425	-0.420	-0.547	-0.479
	(1.63)	(1.30)	(2.16)	(1.57)	(2.61)	(2.09)	(1.81)	(1.70)	(2.22)	(1.99)
PRIM95	-0.027	-0.028	-0.026	0.027	-0.029	-0.026	-0.025	-0.027	-0.025	-0.026
	(3.12)	(3.13)	(2.91)	(2.96)	(3.35)	(2.99)	(2.87)	(2.95)	(2.83)	(2.86)
SEC95	0.028	0.033	0.029	0.031	0.033	0.025	0.024	0.028	0.029	0.029
	(2.54)	(2.93)	(2.54)	(2.71)	(3.10)	(2.25)	(2.11)	(2.44)	(2.55)	(2.61)
OVERALL	0.059									
	(2.40)									
INVF		0.024								
		(2.07)								
MONF			0.015							
			(1.32)							
FINF				0.016						
				(1.30)						
GOVF					0.037					
					(3.35)					
FISF						0.026				
						(1.85)				
TRADEF							0.032			
							(2.33)			
BUSF								0.015		
								(0.83)		
PROPF									-0.016	
									(1.25)	
CORF										-0.007
										(0.47)
No. of obs.	94	94	94	94	94	94	94	94	94	94
R^2	0.51	0.51	0.50	0.50	0.55	0.51	0.52	0.49	0.49	0.49

rates.

In Table 2, aggregate variable of economic freedom is related to GDP growth rates, indicating that countries having more market-oriented institutions tend to grow faster. As for the components of agregate index, only four out of nine components of economic freedom are linked with growth. Favorable investment and trade climates as well as less governments interventions accelarate per

capita GDP growth rates. Other components of economic freedom, business freedom, property rights, monetary freedom, freedom from corruption and financial freedom, appear to be unrelated to per capita real GDP growth rates.

Conclusion

In this paper, a causal relationship between measures of economic freedom and economic well-being is examined. We first introduced a theoretical model explaining the effect of institutional variable on growth. Improvements in Harrod-neutral exogenous institutional variable rise the well-being of a country. After the model introduction, we tested the model by employing a cross-section data set constructed on the basis of similar structural parameters for preferences and technology. We found that economic freedom in general, tend to rise per capita real GDP growth rate and that four components of economic freedom appear to be positively associated with GDP growth rate. The results suggest that less government intervention, favorable trade and investment opportunities improve economic well-being of nations.

REFERENCES

Ayal EB, Karras G (1998). Components of Economic Freedom and Growth: An Empirical Study. J. Dev. Areas, 32: 327-338.

Acemoglu D (2008). Introduction to Modern Economic Growth, Princeton University Press.

Berggren N, Jordahl H (2005). Does Free Trade Really Reduce Growth? Further Testing Using the Economic Freedom Index. Pub. Choice, 122 (1-2): 99-114.

Capolupo R (2009). The New Growth Theories and Their Empirics after Twenty Years. Econ., 3: 1.

Carlsson F, Lundstrom S (2002). Economic Freedom and Growth: Decomposing the Effects. Pub. Choice, 112: 335-344.

Chiang A (1992). Elements of Dynamic Optimization, McGraw-Hill, New York.

Doucouliagos C, Ulubasoglu MA (2006). Economic Freedom and Economic Growth: Does Specification Make a Difference? Eur. J. Polit. Econ., Elsevier, 22(1): 60-81.

Easton ST, Walker MA (1997). Income, Growth, and Economic Freedom. Am. Econ. Rev., 87 (2): 328-332.

Gwartney JD, Holcombe RG, Lawson RA (2004). Economic Freedom, Institutional Quality, and Cross-Country Differences in Income and Growth. Cato J., 24(3): 205-232.

Islam S (1996). Economic Freedom, Per Capita Income and Economic Growth. Appl. Econ. Lett., 3: 595-597.

Heckelman JC, Stroup MD (2000). Which Economic Freedoms Contribute to Growth? Kyklos, 53: 527-544.

Justesen MK (2008). The Effect of Economic Freedom on Growth revisited: New Evidence on Causality from Panel of Countries 1970-1999. Eur. J. Polit. Econ., 24, 642-660.

Miller T, Holmes KR (2009). Index of Economic Freedom. The Heritage Foundation and the Wall Street Journal.

North DC (1989). Institutions and Economic Growth: An Historical Introduction. World Dev., 17(9): 1319-1332.

North DC (2003). The Role of Institutions in Economic Development, Discussion Paper Series, United Nations Economic Commission for Europe, No. 2003.2

Pritchett L (1997). Divergence, Big Tim. J. Econ. Perspect., 11(3): 3-17

Sala-i MX (2002). 15 years of New Growth Economics: What Have We Learnt? , Central Bank of Chile Working Papers, No.172

Saribas H (2009). Economic Freedom and Economic Well-being: A Granger Causality Analysis, Readings in Social Sciences, Int. Conf. Soc. Sci., 5: 9-19.

Weede E, Kampf S (2002). The Impact of Intelligence and Institutional Improvements on Economic Growth. Kyklos, 55: 361-380.

World Development Report (WDR) (2003). World Bank.

Appendix 1. Summary statistics of variables.

Variable	Mean	Std. dev.	Min	Max	Obs
GDPGR	3.099	3.447	-2.752	25.639	167
GDP95	3482	6072	62.23	47885	155
PRIM95	91.31	23.21	28.62	152.9	113
SEC95	54.002	28.27	5.33	101.21	109
LIFE	64.34	9.667	32.64	78.68	173
CAPITAL	23.118	7.61	7.70	57.68	152
POPGR	1.60	1.20	-1.30	6.50	181
OVERALL	56.94	9.42	27.68	89.12	129
INVF	48.53	16.69	10	90	129
MONF	67.80	15.15	0	87.03	129
GOVF	72.66	18.13	0	97.23	129
FISF	74.48	12.31	33.33	99.9	129
TRADEF	64.05	14.91	0	92.5	129
BUSF	60.7	14.45	20	98.91	129
FINF	47.75	15.18	10	80	129
PROPF	42.04	17.93	10	90	129
CORF	33.06	15.45	10	92	129

Appendix 2. Definitions of variables.

GDPGR	Real per capita GDP growth rate from 1995 to 2008
GDP95	1995 value of real per capita GDP
PRIM95	1995 primary school enrollment rate
SEC95	1995 secondary scholl enrollment rate
LIFE	Life expectancy rate
CAPITAL	Gross capital formation rate from 1995 to 2008
POPGR	Population growth rate from 1995 to 2008
OVERALL	Agregate index of economic freedom from 1995 to 2008
INVF	Investment freedom from 1995 to 2008
MONF	Monetary freedom from 1995 to 2008
GOVF	Freedom from government from 1995 to 2008
FISF	Fiscal freedom from 1995 to 2008
TRADEF	Trade freedom from 1995 to 2008
BUSF	Business freedom from 1995 to 2008
FINF	Financial freedom from 1995 to 2008
PROPF	Property freedom from 1995 to 2008
CORF	Freedom from Corruption from 1995 to 2008
MUSLIM	A dummy variable for Muslim countries
SOC	A dummy variable for Socialist countries