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SocialCapitaland Economic Growth; Evidence from Industrial Countries

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ABSTRACT

In this paper, we have considering the relationship between economic growth and social capital. Results indicate that economic growth does Granger cause social capital, but social capital does not Granger cause economic growth. Second, results indicate that a cointegration relation exists between social capital and economic growth. Third, estimation results indicate that the effect of economic growth on social capital is asymmetric. Before a threshold level of economic growth, economic growth has a negative effect on social capital but after this threshold level of economic growth, economic growth has a positive effect on social capital in industrial countries at 2000-2007 periods.

KEY WORDS: Social Capital; Economic Growth; Industrial Countries; Granger Causality Test; Cointegration.

INTRODUCTION

There has been considerable and increasing interest in social capital theory in recent years. Social capital is a sociological concept, which refers to connections within and between social networks. Though there are a variety of related definitions, which have been described as "something of a cure-all" for the problems of modern society, they tend to share the core idea "that social networks have value. Just as a screwdriver (physical capital) or a university education (human capital) can increase productivity (both individual and collective), so do social contacts affect the productivity of individuals and groups (Portes (1998), and Putnam (2000)).The modern emergence of social capital concept renewed the academic interest for an old debate in social science: the relationship between trust, social networks and the development of modern industrial society. Social Capital Theory gained importance through the integration of classical sociological theory with the description of an intangible form of capital. In this way the classical definition of capital has been overcome allowing researchers to tackle issues in a new manner (Ferragina (2010)).

Whiteley (2000) examines the relationship between social capital and economic growth in a sample of thirty-four countries over the period 1970 to 1992, within the framework of a modified neo-classical model of economic growth. The findings suggest that social capital has an impact on growth which is at least as strong as that of human capital or education, which has been the focus of much of the recent work on endogenous growth theory. It appears to have about the same impact on growth as catch-up or the ability of poorer nations to adopt technological innovations pioneered by their richer counterparts.

Helliwell and *Putnam (1995)* find strong convergence of per capita incomes among the Italian regions during the 1960s and 1970s. Convergence is faster, and equilibrium income levels higher, in regions with more social capital, using any of three measures: an index of civic community, the effectiveness of regional government, and citizen satisfaction with regional government. their evidence also supports the idea that the post-1983 increases in regional dispersion of per capita GDP are due to the increased autonomy of regional governments being used more effectively in regions with higher levels of social capital. Both results confirm Putnam's view that social institutions matter, while also supporting a version of conditional convergence that makes catching-up a function of the size of the productivity gap between the richer and poorer regions.

Knack and Keefer (1997) present evidence that “social capital” matters for measurable economic performance, using indicators of trust and civic norms from the World Values Surveys for a sample of 29 market economies. Memberships in formal groups—Putnam's measure of social capital—is not associated with trust or with improved economic performance. They found trust and civic norms are stronger in nations with higher and more equal incomes, with institutions that restrain predatory actions of chief executives, and with better-educated and ethnically homogeneous populations.

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Antoci, Sabatini and Sodini (2011) set up a theoretical framework to analyze the possible role of economic growth and technological progress in the erosion of social capital. Under certain parameters, the relationship between technological progress and social capital can take the shape of an inverted U curve. They show the circumstances allowing the economy to follow trajectories where the stock of social capital grows endogenously and unboundedly.

In Rupasingha*Goetz* and *Freshwater* (2000), the effect of social capital on economic growth is examined using linear regression analysis and U.S. county-level data. Their results reveal that social capital had a statistically significant, independent positive effect on the rate of per-capita income growth.

In this paper, we have considering the relationship between economic growth and social capital in industrial countries consist of USA, UK, Canada, Russia, Germany, France and Italy.

METHODS

The concept of co integration was first introduced into the literature by Granger (1980). Co integration implies the existence of a long-run relationship between economic variables. The principle of testing for co integration is to test whether two or more integrated variables deviate significantly from a certain relationship (Abadir and Taylor, 1999). In other words, if the variables are co integrated, they move together over time so that short-term disturbances will be corrected in the long-term. This means that if, in the long-run, two or more series move closely together, the difference between them is constant. Otherwise, if two series are not cointegrated, they may wander arbitrarily far away from each other (Dickey et. al., 1991).

Further, Granger (1981) showed that when the series becomes stationary only after being differenced once (integrated of order one), they might have linear combinations that are stationary without differencing. In the literature, such series are called "co integrated". If integration of order one is implied, the next step is to use co integration analysis in order to establish whether there exists a long-run relationship among the set of the integrated variables in question. Earlier tests of co integration include the simple two-step test by Engle and Granger (EG hereafter) (1987). However, the EG method suffers from a number of problems. Alternatively, Engle and Yoo (1987) (EY, hereafter) 3-step procedure have been widely recognized as dealing with most of these problems. Nevertheless, a problem remains which is that both EG and EY methods cannot deal with the case where more than one co integrating relationship is possible. Hence, Johansen's Vector Auto Regression (VAR) test of integration (Johansen, 1988) uses a 'systems' approach to co integration that allows determination of up to r linearly independent co integrating vectors ($r \leq g-1$, where g is the number of variables tested for co integration). The Johansen's procedure is useful in conducting individual co integration tests, but does not deal with co integration test in panel settings.

Recognizing the shortcomings of traditional procedures, this study utilized the two types of the heterogeneous panel co integration test developed by Pedroni (1997) which, in addition to using panel data thereby overcoming the problem of small samples, allows different individual cross-section effects by allowing for heterogeneity in the intercepts and slopes of the co integrating equation.

Pedroni's method includes a number of different statistics for the test of the null of no co integration in heterogeneous panels. The first group of tests is termed "within dimension". It includes the panel-v, panel rho(r), which is similar to the Phillips, and Perrontest, panel non-parametric (pp) and panel parametric (adf) statistics. The panel non-parametric statistic and the panel parametric statistic are analogous to the single-equation ADF-test. The other group of tests is called "between dimensions". It is comparable to the group mean panel tests of Im et al. The "between dimensions" tests include four tests: group-rho, group-pp, and group-adf statistics.

The seven of Pedroni's tests are based on the estimated residuals from the following long run model:

$$y_{it} = \alpha_i + \sum_{j=1}^{m} \beta_{ji} x_{jit} + \varepsilon_{it}$$

Where $\varepsilon_{it} = \rho_i \, \varepsilon_{i(t-1)} + w_{it}$ are the estimated residuals from the panel regression.

The null hypothesis tested is whether ρ_i unity is. The seven statistics are normally distributed. The statistics can be compared to appropriate critical values, and if critical values are exceeded then the null hypothesis of no-cointegration is rejected implying that a long run relationship between the variables does exist.Pedroni's heterogeneous panel cointegration method tests only for the existence of long run relationships. The tests indicate the presence or absence of long run links between the variables, but do not indicate the direction of causality when the variables are co integrated. Having detecting the number of co integrated equations (Johansen's procedure) we used an error correction model (ECM) for a country by country analysis. (cointegration necessitates that the variables to be integrated are of the same order). If the variables in the model contain unit roots, the Error Correction

Model (ECM) is used to examine the long-run or co integrating relationships between the time series as well as the existence and the direction of causality between the variables.
The estimated bi-variate ECM for each country takes the following form:

$$\Delta GR_{it} = \alpha_0 + \sum \alpha_{1i} \Delta GR_{it-1} + \sum \alpha_{2i} \Delta SP_{it-1} + \varphi ECT_{it-1} + u_{1it}$$

$$\Delta SP_{it} = b_0 + \sum b_{1i} \Delta SP_{it-1} + \sum b_{2i} \Delta GR_{it-1} + \varphi ECT_{it-1} + u_{2it}$$

Where $\Delta$is the difference operator, GR_t is the GDP growth, SP_t is the social contribution as the index for social capital, ECT_{it-1} is the error correction term derived from the long- run co integrating relationship, u_{1t} and u_{2t} are the white noise error terms t denotes the years.

EMPIRICAL RESULT AND DISCUSSION

First of all, we have tested the Granger Causality Test for considering the causality between social capital and economic growth in industrial countries at 2000-2007 periods. Table 1 indicates the results of Granger Causality Test. Results indicate that economic growth does Granger cause social capital, but social capital does not Granger cause economic growth.

Table 1. Granger Causality Tests

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
SP does not Granger Cause GR	43	0.30240	0.7408
GR does not Granger Cause SP		7.49048	0.0018

Second, we have done panel unit root tests with Eviews software. Table 2 and 3; show the results Panel unit root tests for social capital index and economic growth. Results indicate that these series are nonstationary and these series have a unit root.

Table 2. Panel unit root test: Summary for Social Capital Index

Exogenous variables: Individual effects				
User specified lags at: 1				
Newey-West bandwidth selection using Bartlett kernel				
			Cross-	
Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.93799	0.0000	6	41
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.89684	0.1849	6	41
ADF - Fisher Chi-square	17.1689	0.1434	6	41
PP - Fisher Chi-square	9.15084	0.6900	6	47
** Probabilities for Fisher tests are computed using an asymptotic Chi				
-square distribution. All other tests assume asymptotic normality.				

Table 3. Panel unit root test: Summary for Economic Growth

Exogenous variables: Individual effects				
User specified lags at: 1				
Newey-West bandwidth selection using Bartlett kernel				
Balanced observations for each test				
			Cross-	
Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.41700	0.3383	7	49
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.72347	0.2347	7	49
ADF - Fisher Chi-square	17.7954	0.2163	7	49
PP - Fisher Chi-square	30.1196	0.0073	7	56
** Probabilities for Fisher tests are computed using an asymptotic Chi				
-square distribution. All other tests assume asymptotic normality.				

After we ensure that the variables have a unit root, we have done thePedroniresidual cointegrationtest, Kao residual cointegrationtest and Johansen Fisher panel cointegrationtest, for considering cointegration between social capital and economic growth. Table 4 indicates the results of Pedroni residual cointegration test. Panel v-Statistic and Panel PP-Statistic indicate cointegration between

social capital and economic growth but Panel rho-Statistic and Panel ADF-Statistic indicate no-cointegration between social capital and economic growth.

Table 4. Pedroni Residual Cointegration Test

Included observations: 63				
Cross-sections included: 7 in non-parametric (PP) test; 6 (1 dropped) parametric (ADF) test				
Null Hypothesis: No cointegration				
Trend assumption: No deterministic trend				
Lag selection: fixed at 1				
Newey-West bandwidth selection with Bartlett kernel				
Alternative hypothesis: common AR coefs. (within-dimension)				
			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	3.014733	0.0013	3.001028	0.0013
Panel rho-Statistic	0.466916	0.6797	0.525375	0.7003
Panel PP-Statistic	-2.526640	0.0058	-2.488292	0.0064
Panel ADF-Statistic	-0.126334	0.4497	-0.868596	0.1925
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	1.808990	0.9648		
Group PP-Statistic	-2.007680	0.0223		
Group ADF-Statistic	-0.381741	0.3513		

Table 5 indicates the results of Kao residual cointegration test. Results indicate that the null hypothesis of nocointegrationwas rejected at 95% confidence level. Therefore, results indicate cointegration between social capital and economic growth.

Table 5. Kao Residual Cointegration Test

Null Hypothesis: No cointegration				
Trend assumption: No deterministic trend				
Lag selection: fixed at 1				
Newey-West bandwidth selection using Bartlett kernel				
			t-Statistic	Prob.
ADF			2.096983	0.0180
Residual variance			1.519215	
HAC variance			1.520199	

Johansen Fisher panel cointegration test is indicated in Table 6. Results show existence cointegration between social capital and economic growth.Therefore, overall results indicate that a cointegration relation exists between social capital and economic growth.

Table 6. Johansen Fisher Panel Cointegration Test

Trend assumption: Linear deterministic trend				
Lags interval (in first differences): 1 1				
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	**Fisher Stat.***		**Fisher Stat.***	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	47.00	0.0000	30.56	0.0007
At most 1	39.19	0.0000	39.19	0.0000
* Probabilities are computed using asymptotic Chi-square distribution.				

Then, we have estimated the effect of economic growth on social capital as a quadratic model. We have introduced this idea that economic growth has a nonlinear effect on social capital as a quadratic relationship. In other words, the U-shape exists between economic growth and social capital.

Table 7. Estimation Results

Dependent Variable: SP				
Method: Panel EGLS (Cross-section weights)				
Sample (adjusted): 2001 2008				
Periods included: 8				
Cross-sections included: 7				
Total panel (unbalanced) observations: 51				
Iterate coefficients after one-step weighting matrix				
Convergence achieved after 14 total coef iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.73236	0.310411	111.8916	0.0000
GR	-0.366618	0.173860	-2.108695	0.0411
GR^2	0.072673	0.036507	1.990636	0.0532
AR(1)	0.627386	0.079351	7.906449	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
	Weighted Statistics			
R-squared	0.996770	Mean dependent var		48.87844
Adjusted R-squared	0.996061	S.D. dependent var		27.51285
S.E. of regression	1.136680	Sum squared resid		52.97366
F-statistic	1405.697	Durbin-Watson stat		1.777322
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.993363	Mean dependent var		34.71862
Sum squared resid	54.46427	Durbin-Watson stat		1.373295

Table 7 indicates the estimation results. Results indicate that the effect of economic growth on social capital is asymmetric. First, economic growth has a negative effect on social capital but with increasing in economic growth this relation is inverted. After a threshold level of economic growth, economic growth has a positive effect on social capital in industrial countries at 2000-2007 periods. With increasing in economic growth, economy move to development path. In society with high welfare, social indexes as trust to government, social contribution, political and social freedoms and social networks will increase rapidly.

Conclusion

The notion of social capital has attracted great academic and journalistic attention in last two decades. In this paper, we have considering the relationship between economic growth and social capital. First of all, we have tested the Granger Causality Test for considering the causality between social capital and economic growth in industrial countries at 2000-2007 periods. Results indicate that economic growth does Granger cause social capital, but social capital does not Granger cause economic growth. Second, we have done the Pedroni residual cointegration test, Kao residual cointegration test and Johansen Fisher panel cointegration test, for considering cointegration between social capital and economic growth.Overall results indicate that a cointegration relation exists between social capital and economic growth. Third, we have estimated the effect of economic growth on social capital as a quadratic model. We have introduced this idea that economic growth has a nonlinear effect on social capital as a quadratic relationship. In other words, the U-shape exists between economic growth and social capital.Results indicate that the effect of economic growth on social capital is asymmetric. First, economic growth has a negative effect on social capital but with increasing in economic growth this relation is inverted. After a threshold level of economic growth, economic growth has a positive effect on social capital in industrial countries at 2000-2007 periods.

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