

**Entrepreneurship, Institutional Economics and Economic Growth:
An Ecosystem Perspective**

Small Business Economics

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Appendix.

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Table A0. The description and source of the institutional variables used in the GEI

Institutional Variable	Description	Source of Data	Data Availability
Domestic Market	Domestic market size that is the sum of gross domestic product plus value of imports of goods and services, minus value of exports of goods and services, normalized on a 1–7 (best) scale data are from the World Economic Forum Competitiveness	World Economic Forum	<i>Global Competitiveness Report</i> 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010
Urbanization	Urbanization that is the percentage of the population living in urban areas, data are from the Population Division of the United Nations, 2011	United Nations	http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS/countries
Market Agglomeration	The size of the market: a combined measure of the domestic market size and the urbanization that later measures the potential agglomeration effect. Calculated as domestic market urbanization*	Own calculation	n.a.
Tertiary Education	Gross enrolment ratio in tertiary education, 2011 or latest available data.	UNESCO	http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=167
Business Risk	The business climate rate “assesses the overall business environment quality in a country...It reflects whether corporate financial information is available and reliable, whether the legal system provides fair and efficient creditor protection, and whether a country’s institutional framework is favorable to intercompany transactions” (http://www.trading-safely.com/). It is a part of the country risk rate. The alphabetical rating is turned to a seven-point Likert scale from 1 (D rating) to 7 (A1 rating). December 30, 2012 data	Coface	http://www.coface.com/CofacePortal/COM_en_EN/pages/home/risks_home/business_climate/rating_table?geoarea-country=&crating=&brating=
Internet Usage	The number of Internet users in a particular country per 100 inhabitants, 2012 data	International Telecommunication Union	http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Corruption	The Corruption Perceptions Index (CPI) measures the perceived level of public-sector corruption in a country. "The CPI is a 'survey of surveys', based on 13 different expert and business surveys." (http://www.transparency.org/policy_research/surveys_indices/cpi/2009) Overall performance is measured on a ten-point Likert scale. Data are from 2012.	Transparency International	http://cpi.transparency.org/
Economic Freedom	"Business freedom is a quantitative measure of the ability to start, operate, and close a business that represents the overall burden of regulation, as well as the efficiency of government in the regulatory process. The business freedom score for each country is a number between 0 and 100, with 100 equaling the freest business environment. The score is based on 10 factors, all weighted equally, using data from the World Bank's <i>Doing Business</i> study." (http://www.heritage.org/Index/pdf/Index09_Methodology.pdf). Data are from 2011.	Heritage Foundation/ World Bank	http://www.heritage.org/index/explore.aspx
Tech Absorption	Firm-level technology absorption capability: "Companies in your country are (1 = not able to absorb new technology, 7 = aggressive in absorbing new technology)"	World Economic Forum	<i>Global Competitiveness Report</i> 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010
Staff Training	The extent of staff training: "To what extent do companies in your country invest in training and employee development? (1 = hardly at all; 7 = to a great extent)"	World Economic Forum	<i>Global Competitiveness Report</i> 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010
Market Dominance	Extent of market dominance: "Corporate activity in your country is (1 = dominated by a few business groups, 7 = spread among many firms)"	World Economic Forum	<i>Global Competitiveness Report</i> 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010
Technology Transfer	These are the innovation index points from GCI: a complex measure of innovation, including investment in research and development (R&D) by the private sector, the presence of high-quality scientific research institutions, the collaboration in research between universities and industry, and the protection of intellectual property	World Economic Forum	<i>Global Competitiveness Report</i> 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010

GERD	Gross domestic expenditure on R&D (GERD) as a percentage of GDP, year 2011 or latest available data; Puerto Rico, Dominican Republic, United Arab Emirates, and some African countries are estimated	UNESCO	http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=2656
Business Strategy	Refers to the ability of companies to pursue distinctive strategies, which involves differentiated positioning and innovative means of production and service delivery	World Economic Forum	<i>Global Competitiveness Report 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010</i>
Globalization	A part of the Globalization Index measuring the economic dimension of globalization. The variable involves the actual flows of trade, foreign direct investment, portfolio investment, and income payments to foreign nationals, as well as restrictions of hidden import barriers, mean tariff rate, taxes on international trade, and capital account restrictions. Data are from the 2013 report and based on the 2010 survey. http://globalization.kof.ethz.ch/media/filer_public/2013/03/25/rankings_2013.pdf	KOF Swiss Economic Institute	Dreher (2006)
Depth of Capital Market	The depth of capital market is one of the six sub-indices of the Venture Capital and Private Equity Index. This variable is a complex measure of the size and liquidity of the stock market, level of IPO, M&A, and debt and credit market activity. Note that there were some methodological changes over the 2006–2012 time period, so comparison to previous years is not perfect. The dataset is provided by Alexander Groh.*	EMLYON Business School, France and IESE Business School, Barcelona, Spain	Groh et al. (2012) http://blog.iese.edu/vcpeindex/about/

Per capita GDP

Per capita GDP is in 2005 constant international \$ as reported by the World Bank, <http://www.quandl.com/browse/worldbank/world-development-indicators/economic-policy-external-debt/gdp-per-capita-ppp-constant-2005-international-all-countries>, downloaded: 06/10/2014

Additional Robustness Checks

Below, we present results of additional robustness checks referred to in the main text. They come in pairs that exactly match the estimations we reported in the main body of the paper; that is, in each case they correspond to models as reported in Tables 3 and 4 there.

The first set of tables (Table A.1a and Table A.1b) present specifications based on the same estimator as in the main text, but where GDP growth rate has been replaced by GDP per capita growth rate (always approximated by the logarithmic difference), and correspondingly the two variables representing capital and labour were collapsed into the capital per employed person; again taking the logarithmic difference. Some of the key results get stronger. In model (2) of Table A.1a, the coefficient on GEI increases in significance, while in turn, in model (4), the coefficient on the institutional component gets stronger as well, but in model (3), the coefficient on the individual component now becomes insignificant.

Next, we have two sets of models based on different estimators. In the main text, we report models for which we took proper care to isolate the effects we are interested in, by both first differencing and by applying the fixed effects model estimator. Using those transformations made us confident that our correlations are not spuriously driven by underlying common trends in variables of interest, and at the same alleviated endogeneity concerns. The two additional models we present below isolate effects of the transformations we applied.

First, Tables A.2a and A.2b present results where the variables are not first differenced. Here the results are a bit weaker. In the core specification corresponding to Model 2 of Table 4 in the main text, the corresponding coefficient on GEI is now significant at borderline 10% level. Similar outcome applies to Models 4 and 5 in the second table as reported. In one model (Model 3 of Table 2b) the coefficient becomes insignificant. Individual component is insignificant and institutional component is significant.

Second, Tables A.3a and A.3b are based on first differencing but without applying fixed effects. Now out of five models in which GEI variable is included, in three cases the level of significance increases from 0.05 to 0.01 probability (Model 2 of Table A.3a; Models 4 and 5 of Table A.3b) and in two cases the level of significance of GEI decreases from 0.01 to 0.05 probability (Models 2 and 3 of Table A.3b), compared with the corresponding models in the main text. Significance of the institutional component increases slightly and that of individual component decreases (Models 3 and 4 in Table A.3a).

The variation in significance between models is itself subject to randomness, and as it is not dramatic in scope we abstain from imposing any additional interpretation on it. The overall logic of the results holds.

Table A.1a. Results based on log difference in GDP per capita taken as dependent and capital per employee

	(1)	(2)	(3)	(4)
<hr/> Dependent variable: GDP p.c. growth rate <hr/>				
Capital / Employment = log difference	0.764*** (0.055)	0.535*** (0.114)	0.614*** (0.102)	0.359* (0.139)
GEI = log difference		0.006** (0.002)		
Individual = log difference			0.041 (0.164)	
Institutional = log difference				1.494*** (0.312)
Constant	0.591 (0.588)	3.201* (1.289)	2.538* (1.198)	4.506** (1.484)
<i>Number of Countries</i>	165	46	46	46
<i>Observations</i>	1,961	460	460	460
<i>R-squared</i>	0.478	0.458	0.403	0.569

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

Fixed effects panel estimator

Table A.1b. Results based on log difference in GDP per capita taken as dependent and capital per employee

	(1)	(2)	(3)	(4)	(5)
<hr/> Dependent: GDP p.c. growth rate <hr/>					
Capital / Employment = log difference	0.080 (0.082)	-0.416* (0.170)	-0.415* (0.169)	-0.419* (0.171)	-0.417* (0.170)
GEI = difference		0.001*** (0.000)	0.001** (0.000)		
Index of human capital = difference			0.189 (0.149)		
GEDI = log difference				0.049* (0.022)	0.049* (0.021)
Index of human capital = log difference					0.602 (0.446)
Constant	0.027*** (0.002)	0.033*** (0.004)	0.030*** (0.004)	0.033*** (0.004)	0.030*** (0.004)
<i>Number of countries</i>	165	46	46	46	46
<i>Observations</i>	1,796	414	414	414	414
<i>R-squared</i>	0.003	0.110	0.114	0.102	0.107

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

Fixed effects panel estimator

Table A.2a. Results based on variables in levels. Log of GDP as dependent

	(1)	(2)	(3)	(4)
Dependent variable: Log of GDP				
Log of Capital stock	0.737*** (0.061)	0.595*** (0.077)	0.613*** (0.077)	0.517*** (0.090)
Log of Employment	0.340** (0.122)	0.583*** (0.122)	0.593*** (0.123)	0.550*** (0.115)
Log of GEI		0.066+ (0.035)		
Log of Individual component			-0.034 (0.065)	
Log of Institutional component				0.400** (0.118)
Constant	1.688** (0.614)	2.950** (0.869)	2.906** (0.874)	4.516*** (1.092)
<i>Number of countries</i>	165	46	46	46
<i>Observations</i>	1,961	460	460	460
<i>R-squared</i>	0.776	0.848	0.846	0.862

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

Fixed effects panel estimator

Table A.2b. Results based on variables in levels. Log of GDP as dependent

	(1)	(2)	(3)	(4)	(5)
<hr/> Dependent: Log of GDP <hr/>					
Log of Capital stock	0.737*** (0.061)	0.605*** (0.077)	0.610*** (0.108)	0.595*** (0.077)	0.577*** (0.114)
Log of Employment	0.340** (0.122)	0.583*** (0.123)	0.585*** (0.120)	0.583*** (0.122)	0.578*** (0.119)
GEI		0.001 (0.001)	0.001 (0.001)		
Index of human capital			-0.020 (0.171)		
Log of GEI				0.066+ (0.035)	0.062+ (0.033)
Log of Index of human capital					0.166 (0.486)
Constant	1.688** (0.614)	3.018** (0.886)	2.993** (0.998)	2.950** (0.869)	3.050** (1.056)
<i>Number of countries</i>	165	46	46	46	46
Observations	1,961	460	460	460	460
R-squared	0.776	0.846	0.846	0.848	0.848

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

Fixed effects panel estimator

Table A.3a. Results based on variables in first differences; OLS instead of fixed effects

	(1)	(2)	(3)	(4)
<hr/> Dependent: GDP growth rate <hr/>				
Capital stock = log difference	0.526*** (0.066)	0.654*** (0.066)	0.659*** (0.067)	0.638*** (0.067)
Employment = log difference	0.245*** (0.049)	0.537*** (0.126)	0.535*** (0.129)	0.546*** (0.124)
GEI = log difference		0.045** (0.017)		
Individual component = log difference			0.041 (0.028)	
Institutional component = log difference				0.122** (0.046)
Constant	0.016*** (0.003)	-0.000 (0.003)	0.000 (0.003)	-0.001 (0.003)
<i>Number of countries</i>	165	46	46	46
<i>Observations</i>	1,796	414	414	414
<i>R-squared</i>	0.195	0.430	0.423	0.432

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

OLS estimator

Table A.3b. Results based on variables in first differences; OLS instead of fixed effects

	(1)	(2)	(3)	(4)	(5)
<hr/> Dependent: GDP growth rate <hr/>					
Capital stock= log difference	0.526*** (0.066)	0.655*** (0.066)	0.652*** (0.067)	0.654*** (0.066)	0.643*** (0.068)
Employment = log difference	0.245*** (0.049)	0.533*** (0.126)	0.533*** (0.126)	0.537*** (0.126)	0.536*** (0.126)
GEI = difference		0.001* (0.000)	0.001* (0.000)		
Index of human capital = difference			0.029 (0.093)		
GEI = log difference				0.045** (0.017)	0.045** (0.017)
Index of human capital = log difference					0.219 (0.276)
Constant	0.016*** (0.003)	-0.000 (0.003)	-0.001 (0.003)	-0.000 (0.003)	-0.001 (0.003)
<i>Number of countries</i>	165	46	46	46	46
<i>Observations</i>	1,796	414	414	414	414
<i>R-squared</i>	0.195	0.428	0.428	0.430	0.431

Robust standard errors in parentheses

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$,+ $p < 0.10$

OLS estimator