Economic Growth under Globalization: Evidence from Panel Data Analysis

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Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, OR, July 29 – August 1, 2007

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Abstract

It has been controversial among economists about the impacts of globalization on growth, and the debate over the issue has intensified in recent years. In this study, we employ reliable panel data and an empirical growth model derived from production theory to investigate the effects of globalization on economic growth. The estimation results strongly suggest that economic globalization has a significant positive effect on economic growth for all countries. However, China and India would gain the most, followed by developed countries, and other developing countries would gain the least. Other important determinants of economic growth include capital, human capital, and technology.

JEL Classification: F15; F43

Keywords: Globalization, Economic growth, Measure of Economic Globalization

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1. Introduction

In today's world, no nation exists in economic isolation. All aspects of a nation's economy are linked to the economies of its trading partners (Carbaugh 2004). With unprecedented global interdependence, increased international trade, and internet linking all countries and regions of the world, we literally live in a "global village" where national boundaries are of diminishing significance. The globalization issue has sparked a considerable debate over the past two decades. Many economists have argued that globalization is a beneficial process and is a key to the economic development of the world (e.g., International Monetary Fund, 2000; Friedman, 2000; Fishcher, 2003; Bhagwati, 2004; Wolf, 2004). Others have criticized that globalization may be a depressing process and may increase inequality between and within nations (e.g., Rodrik, 1997; Tonelson, 2002; Sullivan, 2002; Batra, 2005). The debate over globalization issue has intensified in recent years (Fischer, 2003**;** Heshmati 2003).

Globalization is more than an economic phenomenon. It is a complex and multifaceted process which contains many aspects such as trade, capital movement, movement of people, spread of knowledge and technology, and political and culture influence, etc. The term of globalization was coined in the 1980's, but the concept is an old one, and our planet has already experienced with globalization for almost two centuries (Williamson, 2002; Intriligator, 2003). With respect to migration and labor flows, it is generally believed that the world tends to be less globalized over time due to an increasing restriction on human migration (Sutcliffe and Glyn, 1999; Fischer, 2003). By contrast, the countries and regions across the world have become more interdependent with regard to the economic aspect of globalization. Economic globalization means the integration of individual countries' organizations of production, distribution, and consumption of commodities into the world economy (Chase-Dunn et al, 2000). Three most important vehicles of economic globalization include international trade in goods and services, foreign direct investment, and global financial flows (Mahler, 2004).

Despite a number of multi-country case studies utilizing comparable analytical framework, numerous economic studies using large cross-country data sets, and important theoretical advances concerning how a country's international economic policies and its economic growth rate interact, the empirical evidence is insufficient and thus it is still controversial among economists about the effects of economic globalization on economic growth (Baldwin, 2003). While many economists have argued that openness or integration into global economy would promote economic growth (e.g., Grossman and Helpman, 1991; Dollar, 1992; Frankel and Romer, 1999; Fishcher, 2003), these claims have been criticized by other economists (e.g., Edwards, 1993; Rodirguez and Rodrik, 2001). One particular problem is that many previous studies used narrowly defined measure of economic globalization such as trade openness or FDI rather than a comprehensive measure of economic globalization. Moreover, model specifications in some previous empirical studies do not follow economic theory.

The objective of this study is to examine the effects of economic globalization on economic growth, using a pooled technique. Since developed countries are more abundant with technology, capital, and human capital than developing countries, we hypothesize that developed countries gain more from globalization than developing countries. Also, we hypothesize that China and India gain more from globalization than other developing countries since the two largest developing countries in the world have their own distinguished characteristics such as huge population, abundant skilled and unskilled labor force, and so on. In this study, we focus on only one issue of economic globalization: whether integration into the global economy of a country promotes the economic growth of the country. Other issues of economic globalization such as poverty and environment are not covered in the study.

The paper is organized as follows. Section two develops the empirical model for economic growth used in this study. Section three discusses data and estimation methods as well as the construction of two different globalization indices. Section four presents estimation results and discusses our findings. The final section summarizes and concludes the paper.

2. An Empirical Model for GDP Growth

The multi-input Cobb-Douglas production function is a primary feature of many models of economic growth and can be written as follows (Nicholson 1998):

$$Y = \prod_{i=1}^{n} X_i^{\alpha_i} \qquad (1)$$

where Y is real GDP; X_i is input factor i (i = labor, capital, …, input factor n); and α_i is the elasticity of Y with respect to input X_i.

It is clear that the production function exhibits constant returns to scale if $\sum_{i=1}^{n} \alpha_i = 1$, where $0 \leq \alpha_i < 1$, implying that each input exhibits diminishing marginal productivity. Any degree of increasing returns to scale can be incorporated into the above Cobb-Douglas function, depending on $\varepsilon = \sum_{i=1}^{n} \alpha_i$.

According to the existing literature on economic growth, input factors in equation 1 may include labor, capital, human capital, technology, foreign direct investment, and international trade. Labor and capital are the two fundamental input factors in economic growth model. For example, Solow's (1956) pioneering model of equilibrium growth is based on Cobb-Douglas function with two inputs (labor and capital) and constant returns to scale. Human capital is a way of defining and categorizing peoples' skills and abilities used in employment. It plays a critical role in endogenous growth models. However, many early economic theories refer to it simply as labor. As a matter of fact, labor is measured by counts of employed people, which implicitly suggest that labors are equally productive regardless of formal education and on-the-job training experience. Following Romer (1990), we include human capital in our empirical model because human capital is different from labor. Technological progress improves the factor productivity and it should be taken into account in our empirical model. FDI and international trade the have long been recognized as important factors that drive economic growth (e.g., Dollar and Kraay, 2004; Balasubramanyam et al, 1996; Salvatore and Hatcher, 1991). They are among the important vehicles of economic globalization, as discussed earlier. Since the purpose of this study is to examine the effects of economic globalization on economic growth. An additional independent variable is an index that measures the degree of economic globalization.

Let *L*, *K*, *H*, *T*, and *G* represent labor input, domestic capital stock, human capital, technology, and economic globalization, respectively, equation 1 becomes:

$$\mathrm{Y} = L^{\alpha_1} K^{\alpha_2} H^{\alpha_3} T^{\alpha_4} G^{\alpha_5} \quad (2)$$

By taking the natural logarithm and total derivative from equation 2, we get the following GDP growth equation:

$$\dot{Y} = \alpha_1 \dot{L} + \alpha_2 \dot{K} + \alpha_3 \dot{H} + \alpha_4 \dot{T} + \alpha_5 \dot{G} \quad (3)$$

where a dot above each variable indicates its rate of growth and α_i is the elasticity of *Y* with respect to input factor i.

Since the growth rates of domestic capital stock ($\dot{K}$) is unknown for many countries, we follow the method widely used in previous studies (e.g. Feder 1983, Ram 1985, and Balasubramanyam et al 1996) by replacing $\dot{K}$ with the more tractable variable $\frac{\Delta K}{Y}$, which approximates the share of a country's domestic investment in GDP. Similarly, since the stocks of foreign direct investment, portfolio capital, and trade are unknown, we replace $\dot{G}$ with the more tractable variable $\frac{\Delta G}{Y}$, where ΔG includes FDI, trade, portfolio capital flows. Therefore, $\frac{\Delta G}{Y}$ is essentially a linear combination of the shares in GDP of the three components that constitute economic globalization variable (*G*).

Defining $K_y = \frac{\Delta K}{Y}$ and $G_{in} = \frac{\Delta G}{Y}$, adding two dummy variables (D_1 equals to one for developed countries and equals to zero otherwise, and D_2 equals to 1 for China and India and equals to zero otherwise[1]), two interactive term between the dummy variables and the globalization index, and adding an intercept (α_0) and an error term (ε), the empirical model is specified on the basis of equation 3 as follows:

$$\dot{Y} = \alpha_0 + \alpha_1 \dot{L} + \alpha_2 K_y + \alpha_3 \dot{H} + \alpha_4 \dot{T} + \alpha_5 G_{in} + \alpha_6 D_1 + \alpha_7 D_2$$

$$+ \alpha_8 G_{in} D_1 + \alpha_9 G_{in} D_2 + \alpha_{10} \varepsilon \quad (4)$$

[1] We believe that China and India are different from other developing countries due to their distinguished huge population and structure of economies. This amounts to using other developing countries as the control group.

The signs for α_1 and α_2 are expected to be positive. An increase in the investment of labor and capital in an economy would promote GDP growth. The signs for α_3 and α_4 are expected to be positive since technological progress and the increase of human capital increase factor productivity. If the sign for α_5 is positive, it means that an increase in economic globalization (more integration into the world economy of a country) would promote the economic growth of the country. We would expect the sign for α_5 to be positive since the key components of the economic globalization variable such as FDI and international trade have positive correlation with economic growth, as discussed earlier. If the sign for α_5 is negative, it means that wider economic openness of a country would disfavor economic growth of the country. Parameters α_6 and α_7 are adjusters of the constant coefficient (α_0) for developed countries and China and India, respectively. The signs for α_6 and α_7 would be negative if developed countries, China, and India have relatively lower growth rates than other developing countries. Parameters α_8 and α_9 are adjusters of the coefficient of globalization index variable (α_5). The signs for α_8 and α_9 are positive (negative) if developed and China and India have higher (lower) growth rates with globalization than other developing countries.

3. Data and Estimation Method

We use a panel dataset covering 56 countries and a period of 14 years from 1991 to 2004, based on data availability. The 56 countries include 19 developed countries and 37 developing countries (Appendix 1). For each country, the annual time series data for variables, including GDP growth rate, labor, capital, foreign direct investment, portfolio capital flow, trade, consumer price indices, per capita GDP, human capital, and indicator of technology, are obtained from the

World Bank's World Development Indicators (WDI) online database. The real exchange rates are obtained from the online database of the Economic Research Service of the U.S. Department of Agriculture. The summary statistics of the panel data set are presented in Appendix 2.

Following many of the previous studies about growth and human capital (e.g., Lucas, 1988; Barro, 1991), we use the growth rate of tertiary school enrollment as proxy for the growth rate of human capital ($\dot{H}$) in equation 4. Technology is intangible and is difficult to measure directly. Previous studies have used various proxies for the level of technology, which include research and development (R&D) expenditure, number of patents, total factor productivity, and labor productivity measured by GDP per capita, and so on. Since R&D data are not available for a number of countries in our sample, we use the ratio of high-technology exports to the manufactured exports as the proxy variable for technology.

Although there is general agreement about what economic globalization encompasses as a concept, how to measure economic globalization is still controversial and a number of studies in the existing literature have tried to derive alternative measures for economic globalization (e.g., Shin, 2002; Anderson, 2003; Heshmati, 2003; Kearney A. T., Inc. and the Carnegie Endowment for International Peace, 2003). In this study, two different economic globalization indices are constructed for the estimation of equation 4. The first index consists of two variables: trade and foreign direct investment. The second index consists of three variables: trade, foreign direct investment, and portfolio capital flows. Both critics and supporters of globalization consider that FDI and Trade are of equally importance (Mahler, 2004). We treat all components that constitute the economic globalization variable with equal weights. Since the data for FDI and portfolio capital flows are available only in the form of net flows as a percentage of GDP, which are much smaller in magnitudes than the actual FDI and portfolio capital inflows and outflows. If the components of economic globalization are simply added up, it would underestimate the effects of FDI and portfolio capital flows while overestimate the effects of trade and income payments and receipts. To overcome this problem, all the components constituting economic globalization variable are indexed on the base year 2000 before they are added up with equal weights to form the economic globalization indices. Also, when we construct the second and third globalization indices, the portfolio capital flows are added up with FDI before being indexed since portfolio capitals are zeros for some countries.

Several potential econometric problems were addressed before estimation. First, non-staitonarity of the data may lead to spurious estimation results (Entorf 1997). We have evaluated the stationarity properties of the variables using Pesaran (2003) panel unit root test method. The test results are summarized in Table 1. All the variables under test tend to be stationary. Second, the economic globalization index variable (G-index) in equation 3 might be endogenously determined since its components such as foreign direct investment and portfolio capital flows are endogenous. A firm's decision to invest in another country is influenced by many factors such as the host country market size and economic stability in the host country. In addition, G-index variable is potentially correlated with the error term since all the components of the variable are expressed in terms of the percentage of GDP, which also is the component of the dependent variable, GDP growth rate. To test the exogeneity of the variable, we have used the Davidson-Mackinnon (1993) test[2]. The null hypotheses stating that an OLS fixed effect model would result in consistent estimates cannot be rejected at a 5% level for all cases (Table 1), indicating that globalization index variable is exogenous variable. Third, there is potential

[2] Davision and MacKinnon show that this test, which is similar to the (Durbin-Wu-)Hausman test, will always yield a computable test statistic, whereas the Hausman test, depending on the difference of estimated covariance matrices being a positive definite matrix, often cannot be computed by standard matrix inverse methods.

problem of serial correlation for the panel data set. We have tested for serial correlation using the test for panel data derived by Wooldridge (2002)[3]. The null hypothesis of no serial correlation cannot be rejected at a 5% level for all cases, indicating no serious symptom of serial correlation. Finally, there is potential problem of heteroskedasticity across the countries in our data set. We have performed a likelihood-ratio test for heteroskedasticity. The null hypothesis is rejected at a 1% level for both cases (Table 1), indicating that our data suffer from the symptom of heteroskedasticity.

[Table 1 may insert here]

The classical two-stage least squares (2SLS) estimator is inconsistent due to the above-mentioned problem of heteroskedasticity problem. We use the generalized least squares (GLS) estimation method to estimate our model. The heteroskedasticity problem associated with the panel data set is taken into account in estimation.

4. Estimation Results and Discussion

The estimation results are summarized in Table 2. All the estimated parameters have the expected signs and most of the estimated coefficients are statistically significant at different significance levels.

[Table 2 may insert here]

Specifically, for case one in which economic globalization variable consists of FDI and trade, the output elasticity of labor is 0.076 and is statistically significant at a 5% level. This indicates that if labor input increases by 1%, ceteris paribus, the real GDP would increase by

[3] Drukker (2003) has demonstrated that this test is attractive because it can be applied under general conditions and easy to implement.

about 0.076%. The output elasticity of capital is 0.147 and is statistically significant at a 1% level. This means that if capital input increases by 1%, ceteris paribus, the real GDP would increase by about 0.163%. The estimated coefficient for the human capital variable is 0.022 and is merely significant at a 10% level. This implies that if the tertiary school enrollment increases by 1%, the real GDP would increase by 0.022%. The estimated coefficient for the technology is 0.012 and is statistically significant at a 10% level, suggesting that a 1% increase of the ratio of high-tech product exports to manufacturing exports would lead to a 0.012% increase for the real GDP.

The estimated coefficient for the economic globalization variable is 0.247 and is statistically significant at a 10% level. This implies that if the ratio of trade and FDI over GDP increases by 1%, the real GDP for the developing countries (excludes China and India) would increase by 0.247%. The estimated coefficient for the dummy variable representing developed countries is -2.420 and is statistically significant at a 1% level. As a result, the adjusted intercept for developed countries is -2.386 (= 0.034 - 2.420). This means that without controlling the effects of labor, capital, human capital, technology, and globalization, the GDP growth rate for developed countries is, on the average, less than that for developing countries by 2.42%. The reasons why developing countries tend to grow faster than developed countries may include: (1) developing countries have lower ratio of capital to labor and have higher marginal productivity of capital and thus tend to grow faster based on neoclassical growth model, and (2) developing countries have much lower GDP base than developed countries and thus tend to have higher magnitude in terms of growth rate. Due to this reason, even if GDP growth rates for developed countries are relatively smaller than developing countries, the absolute values of GDP increase are generally higher for developed countries. For instance, while China's GDP growth rate (averaged at 10.14% in 1991-2004) is much higher than U.S. GDP growth rate (averaged at 3.07% in 1991-2004), the absolute value of GDP increase (at constant 2000 U.S. dollars) in China is much smaller (an annual average of 90.7 billion) than that in the Untied States (an annual average of 206.6 billion) since the United States has much larger GDP base than China. The estimated coefficient for the dummy variable representing China and India is -0.432, but it is not statistically significant. This suggests that without controlling the effects of labor, capital, human capital, technology, and globalization, the GDP growth rates for China and India would not be significantly different from the growth rates for other developing countries.

The estimated coefficient for the interaction term between the globalization variable and the dummy variable for developed countries is 1.872 and is statistically significant at a 1% level. Therefore, the adjusted coefficient of the globalization variable for developed countries is 2.119 (= 0.247 + 1.872), indicating that a 1% increase in the ratio of trade and FDI over GDP would result in an increase of 2.119% in real GDP for developed countries. This proves our hypothesis that developed countries benefit more from globalization than developing countries since developed countries are more abundant in technology, capital, and human capital and thus are more competitive in the world market. The estimated coefficient for the interaction term between the globalization variable and the dummy variable for China and India is 3.243 and is statistically significant at a 1% level. Therefore, the adjusted coefficient of the globalization variable for China and India is 3.490 (= 0.247 + 3.243), indicating that a 1% increase in the ratio of trade and FDI over GDP would result in an increase of 3.490% in real GDP for China and India. This proves our hypothesis that China and India benefit more from globalization than other developing countries since the two largest developing countries have their distinguished characteristics, as discussed earlier. Note that the adjusted coefficient of the globalization variable for China and India is also much higher than that for the developed countries. This implies that China and India are even more competitive than developed countries under globalization. This is because: (1) the two largest developing countries not only have great market potential (with huge population and increased per capita income), but they also have abundant skilled and unskilled labor force. These have made the two countries very attractive in securing foreign direct investment and other foreign capital loans, which in turn further enhances the two countries' competitiveness not only in the sector of labor-intensive products (e.g., textile products) but also in the sector of high-technology manufacturing. For example, the increased U.S. huge trade deficit with China in recent years is mainly due to the rapid increase in Chinese exports of high-tech manufacturing goods to the United States (Koo and Zhuang, 2007); and (2) in comparison with developed countries, China and India have relatively weak labor union and loose regulations on environmental protection and nature conservancy, which further reduce the cost of production and thus increase their competitiveness in the world market.

For case two where economic globalization variable consists of FDI, portfolio capital flows, and trade, the estimated coefficient of globalization variable for developing countries is 0.221. The adjusted coefficient of globalization variable for developed countries is 2.136 (= 0.221 +1.915) and that for China and India is 4.714 (=0.221+ 4.493). The estimated coefficients for all other variables including labor, capital, human capital, and technology are quite similar in magnitude to the estimation results for case one.

5. Summary and Conclusions

It has been controversial among economists about the effects of globalization on economic growth. Many previous studies used narrowly defined measure of economic globalization such as trade openness or FDI and model specifications usually did not follow from production theory. The conclusions based on those studies have been controversial. In our study, we have investigated the effects of economic globalization on economic growth using a panel data set covering 56 countries and a time period of 14 years from 1991 to 2004. We have constructed two different indices to measure economic globalization. An empirical GDP growth model is derived based on a multi-input Cobb-Douglas production function. The generalized least squares estimator is used to estimate the parameters of the model, and the heteroskedasticity problem associated with the panel data set is taken into account in estimation.

The estimated parameters have expected signs for all variables and the most of the estimated coefficients are statistically significant. The estimated coefficient for the economic globalization variable is 0.247 and 0.221 for two different specifications of economic globalization. This indicates that economic globalization promotes economic growth for developing countries. The adjusted coefficients of the globalization variable for developed countries range from 2.119 to 2.136 and those for China and India range from 3.490 to 4.714. These findings suggest that globalization benefits all countries. However, China and India benefit the most from globalization, followed by developed countries, and other developing countries benefit the least. Therefore, it may be plausible for the developed countries as well as China and India to consider some concessions and give some preferential treatments to other developing countries in global trade negotiations so as to realize a more balanced gain from globalization for all countries. In addition, the growth of capital, human capital, and technology contribute significantly to economic growth. These are consistent with the findings from previous studies.

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Table 1 – Results of Panel Unit Root Tests and Other Tests

Pesaran Panel Unit Root Test for Non-stationarity	
Variable	T-bar statistic
GDP ($\dot{Y}$)	-2.802*** (0.000)
Labor ($\dot{L}$)	-2.910*** (0.000)
Capital (K_y)	-2.076*** (0.008)
Human Capital ($\dot{H}$)	-2.741*** (0.005)
Technology ($\dot{T}$)	-2.567*** (0.000)
Globalization Index (*G-index*, case 1)	-2.311** (0.002)
Globalization Index (*G-index*, case 2)	-2.346*** (0.000)

Davidson-MacKinnon test of exogeneity for Globalization Index Variable
Case 1: F(1, 722) = 0.409 (0.523)
Case 2: F(1, 722) = 0.616 (0.433)

Wooldridge Test for Autocorrelation
Case 1: F (1, 55) = 2.008 (0.162)
Case 2: F (1, 55) = 2.074 (0.156)

Likelihood-ratio Test for Heteroscedasticity
Case 1: χ^2 (55) = 390.8 (0.000)
Case 2: χ^2 (55) = 392.9 (0.000)

Note: p-values are in parentheses. For case 1, the globalization index consists of trade and foreign direct investment. For case 2, the globalization index consists of trade, foreign direct investment, and portfolio capital flows.

Table 2 – Generalized Least Squares (GLS) Parameter Estimates

	Parameters	Variables	Estimates	
Case 1	α_0	Intercept	0.034	(0.413)
	α_1	Labor ($\dot{L}$)	0.076**	(0.038)
	α_2	Capital (K_y)	0.147***	(0.017)
	α_3	Human Capital ($\dot{H}$)	0.022*	(0.013)
	α_4	Technology ($\dot{T}$)	0.012*	(0.007)
	α_5	Globalization Index (G_{in})	0.247*	(0.145)
	α_6	Dummy variable 1 (D_1)	-2.420***	(0.360)
	α_7	Dummy variable 2 (D_2)	-0.432	(1.234)
	α_8	Interaction Term 1 ($G_{in}D_1$)	1.872***	(0.469)
	α_9	Interaction Term 2 ($G_{in}D_2$)	3.243***	(1.187)
Case 2	α_0	Intercept	0.146	(0.410)
	α_1	Labor ($\dot{L}$)	0.079**	(0.038)
	α_2	Capital (K_y)	0.142***	(0.017)
	α_3	Human Capital ($\dot{H}$)	0.020	(0.013)
	α_4	Technology ($\dot{T}$)	0.011*	(0.006)
	α_5	Globalization Index (G_{in})	0.221*	(0.130)
	α_6	Dummy variable 1 (D_1)	-2.429***	(0.358)
	α_7	Dummy variable 2 (D_2)	-1.299	(1.188)
	α_8	Interaction Term 1 ($G_{in}D_1$)	1.915***	(0.465)
	α_9	Interaction Term 2 ($G_{in}D_2$)	4.493***	(1.262)

Note: Standard errors are reported in parentheses for parameter estimates; ***, **, and * represent significance level at 1%, 5%, and 10%, respectively; For case 1, the globalization index consists of trade and foreign direct investment; For case 2, the globalization index consists of trade, foreign direct investment, and portfolio capital flows.

Appendix 1: Fifty-six Countries under Study

1	Argentina	29	Japan *
2	Australia *	30	Jordan
3	Austria *	31	South Korea
4	Belgium *	32	Madagascar
5	Bolivia	33	Malaysia
6	Botswana	34	Mali
7	Brazil	35	Mexico
8	Canada *	36	Morocco
9	Chile	37	Netherlands *
10	China	38	New Zealand *
11	Colombia	39	Nigeria
12	Costa Rica	40	Norway *
13	Cote d'Ivoire	41	Pakistan
14	Dominican Republic	42	Panama
15	Ecuador	43	Philippines
16	Egypt	44	Portugal *
17	Finland *	45	Senegal
18	France *	46	Spain *
19	Gabon	47	Sri Lanka
20	Germany *	48	St. Vincent and the Grenadines
21	Ghana	49	Swaziland
22	Guatemala	50	Sweden *
23	Honduras	51	Thailand
24	Iceland *	52	Trinidad and Tobago
25	India	53	Tunisia
26	Indonesia	54	United Kingdom *
27	Ireland *	55	United States *
28	Italy *	56	Venezuela

Note: * Represents developed countries, and the rest are developing countries.

Appendix 2: Summary Statistics of the Panel Data Set

Variable		Mean	Standard Deviation	Minimum	Maximum	Observations	
GDP Growth Rate	overall	3.57	3.37	-13.13	18.66	N =	784
	between		1.61	1.29	10.14	n =	56
	within		2.97	-14.00	19.53	T =	14
Labor Growth Rate	overall	2.11	1.99	-16.49	21.38	N =	784
	between		1.24	-0.13	6.52	n =	56
	within		1.56	-15.97	21.89	T =	14
Capital (% of GDP)	overall	22.32	5.78	6.92	43.64	N =	784
	between		4.82	11.38	36.73	n =	56
	within		3.24	8.66	34.81	T =	14
Trade (% of GDP)	overall	73.71	38.70	13.75	228.88	N =	784
	between		37.50	19.10	193.98	n =	56
	within		10.68	30.34	112.44	T =	14
FDI (% of GDP)	overall	4.47	9.27	-8.48	184.93	N =	784
	between		5.23	-0.92	34.71	n =	56
	within		7.69	-26.03	154.70	T =	14
Portfolio Capital Flows (% of GDP)	overall	0.34	1.03	-4.73	8.59	N =	784
	between		0.58	-0.26	2.24	n =	56
	within		0.86	-4.39	6.93	T =	14
Real Exchange Rate Index	overall	90.58	20.43	24.44	257.09	N =	784
	between		12.81	66.88	133.95	n =	56
	within		16.00	46.08	223.17	T =	14
Consumer Price Index	overall	89.30	27.24	0.01	236.77	N =	784
	between		8.11	64.84	104.30	n =	56
	within		26.03	13.55	250.81	T =	14
Per Capita GDP	overall	11576.6	10056.7	672.6	36465.1	N =	784
	between		10001.8	772.8	32071.0	n =	56
	within		1662.3	2242.2	22192.6	T =	14
Technology	overall	12.63	13.72	0.02	74.96	N =	784
	between		12.57	0.43	56.10	n =	56
	within		5.75	-15.95	50.35	T =	14
Human Capital	overall	29.76	22.27	0.58	95.21	N =	784
	between		21.32	1.47	74.67	n =	56
	within		7.00	4.93	56.67	T =	14

Note: Per capita GDP is in the form of PPP (purchasing power parity) adjusted per capita GDP on the base year 2000. Real exchange rate for the United States is the real effective exchange rate based on relative consumer prices. Technology refers to the ratio of high-technology exports to manufactured exports. Human capital refers to the growth rate of tertiary school enrollment, which is available for 1991 and 1999 – 2004. Data of human capital for other years are estimated through extrapolation.