

Why participate in the “One Belt and One Road”

Initiative? An income convergence approach

Abstract

This paper seeks to investigate the motivations of countries that participate in the One Belt and One Road (B&R) Initiative, a China-led economic development programme with the intention of enhancing regional economic cooperation. We examine the income convergence hypothesis for B&R countries with both linear and nonlinear unit root tests to detect the presence of economic integration over the periods 1960-2016 and 1979-2016. For the B&R countries that are found to show income convergence to China in our income convergence testing, we argue that they tend to have a strong existing economic relationship with China. By contrast, the countries that have relatively weak economic relationships with China tend to show no convergence to China, and they take advantage of the B&R as an opportunity to catch up. Moreover, we find evidence that more countries converge to China's real per capita income for the years after 1978 when China started its transition to a market economy and initiated the open-door policy to embrace globalization. The results suggest that China contributes to a higher degree of income convergence in regional integration.

Keywords: One Belt and One Road, China, Economic Integration, Income Convergence

JEL classification: R, C1, C5

1. Introduction

The One Belt and One Road Initiative, also known as the Belt and Road (B&R) Initiative, is a significant development strategy launched by China in 2013. The initiative has been designed to promote free flows of economic factors and to enhance economic cooperation among B&R countries. Hence, it can be regarded as a China-led move to improve market integration and create a regional economic cooperation framework. A major focus of the B&R Initiative is the construction of infrastructure facilities including rail and road networks, ports, telecommunications, and energy pipelines that promote the connectivity of Asia, Europe, and Africa.

Given the significant cross-country disparity between B&R participating countries in terms of income level, geographical location, and particularly the level of economic integration with China, we believe the motivation for participating in the B&R Initiative might vary across countries as well. For the countries that already established solid economic cooperation with China, they regard this initiative as a plan to enhance the existing relationship to a higher level, while the countries with little economic integration with China might want to take advantage of the B&R Initiative as an opportunity to catch up. The central task of this study is to investigate these B&R countries' motivations for greater economic integration with China. More specifically we want to identify which of those B&R countries are driven by the motivation to enhance existing economic integration and which are driven by the catch-up motivation.

To answer the central question regarding the motivations of B&R participation, we examine the 65 B&R participating countries for income convergence to China. One of the widely held views among mainstream economists is a strong link between economic integration and income convergence. In theory, free capital flow is expected to help poor countries more as the

classic economic growth theory suggests that capital tends to flow from high to low-income economies

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¹ According to the Solow model, the existence of incentives for capital to flow from rich to poor countries is mainly driven by diminishing returns to capital or lower rate of return on capital in rich countries.

Free trade as a channel of technology spillover gives a poor country access to superior technology embodied in goods and allows greater productivity gains in the poor country (Fan 2004). Hence, high economic integration between countries in terms of capital and trade flows and technology sharing is supposed to reduce the income gap between the rich and the poor.

In the context of the B&R Initiative, we seek to examine the process of convergence in terms of relative real per capita income of B&R countries towards China. In the milestone year of 1978 in contemporary China, the country began a transition to a market economy and an adoption of open-door policies to embrace globalization. It is widely agreed that China's economic system has experienced a fundamental reform after 1978. Hence, we test for B&R countries with respect to China over 1960-2016 and the post-reform period of 1979-2016. If a country is found to exhibit income convergence to China, then its B&R participation can be explained as being driven by existing strong economic relationship with China. By contrast, if a country shows no convergence to China, then the country participates in the B&R Initiative mostly because of its desire to catch up in economic integration with China.

Our study is aimed to gain a better understanding of the motivations that drove countries to participate in B&R by examining the income convergence hypothesis between China and B&R participating countries. This article contributes to the existing economic integration and income convergence literature in two ways. First, to the best knowledge of authors, we are the first to apply both linear and nonlinear unit root tests to examine the income convergence hypothesis within the context of the B&R Initiative. Second, this is the first study to examine income convergence among B&R countries in the context of China's economic reform that started in the year 1978.

The remainder of the article is structured as follows: section 2 provides a brief review of the existing literature on income convergence. Section 3 describes data and methodology; Section 4 presents empirical results and discussion. Section 5 concludes.

2. Literature Review

The study on cross-country income convergence is primarily based on Solow's classic growth theory (1956). This neo-classical growth model predicts that an economy will converge to a balanced growth path and, meanwhile, per capita income in a country will eventually grow to reach that country's steady-state value. The country-specific steady-state value, according to Solow, is determined by that country's structural characteristics including capital accumulation, depreciation of existing capital, population growth, technology, initial endowments, and so on. A major implication of the Solow model is that income levels across different countries tend to converge and between-country income disparities tend to decline over time.

There have been a vast amount of empirical studies devoted to the test of the income convergence hypothesis. Many of the existing literature on income convergence are based on the cross-sectional analysis, which regresses per capita gross domestic product (GDP) growth rates on initial income levels. Under the hypothesis of income convergence, poor countries starting with a lower real per capital GDP should have a higher growth rate. Thus, a negative relationship between the per capita income growth and the initial level of income across economies over a given period of time is interpreted as evidence in favour of the income convergence. The income convergence hypothesis implies that, over a long period of time, the per capita income level of a poor country will tend to catch up with the level of a rich country (see e.g., Baumol, 1986). Early studies including Baumol (1986) and Mankiw, Romer, and Weil (1992) use cross-section data to

test income convergence. Islam (1995) develops a panel-data approach using the same regression and data as Mankiw et al. (1992). As Islam (1995) argues, the panel-data approach provides the advantage of accounting for a country's total factor productivity at the initial level of income which should be included in the individual effect. In order to control for cross-country differences in steady state, Barro (1991), Barro and Sala-i-Martin (1992), and Mankiw et al. (1992) include the determinants of country-specific steady states (e.g., population growth, rate of capital depreciation, saving rates, and technological progress) as conditional variables in their research. While there is little evidence of unconditional convergence among countries with considerable structure difference, these studies find evidence of the conditional income convergence. However, Friedman (1992), Quah (1993), and Evans (1997) point out that the use of cross-sectional methods may generate inconsistent convergence rate estimates and invalid test statistics. In addition, Bernard and Durlauf (1995) suggest that it is possible that a group of divergent countries can exhibit a negative relationship between initial output and income growth (as described by Baumol, 1986) so long as the marginal product of capital is diminishing.

Existing empirical literature also utilizes a time-series approach to test income convergence. The income convergence hypothesis implies that the relative real output per capita should be mean reverting so that income disparities between countries are not persistent over time. This implication leads naturally to the use of unit root tests in examining the hypothesis of income convergence, i.e., relative income per capita between countries should display the stationarity behaviour and do not have a unit root. Bernard and Durlauf (1995) suggest that the existence of a common long-run trend in real GDP per capita across countries can be interpreted as evidence for income convergence. The study investigates income convergence by directly examining the univariate dynamics of annual log real output per capita across 15 OECD

countries. The unit root tests are employed to detect the presence of integrated processes. However, Bernard and Durlauf (1995) find little evidence of output convergence. Evans (1998) employs unit root tests to examine whether countries revert towards a common trend. The study finds evidence of income convergence for a sample of 13 developed countries and a sample of countries with relatively well-educated populations. In contrast, countries with relatively poorly educated populations display different growth patterns. Cheung and Pascual (2004) study income convergence for the G7 countries using time series unit root tests. This study uses the stationarity properties of real per capita GDP relative to the US to infer income convergence. Cheung and Pascual (2004) also highlight the power issue of using standard unit root procedures in testing output convergence and employ a panel framework to improve the power performance. Lau (2010) examines the regional convergence of the US states. Using both linear and panel nonlinear unit root tests, the study finds evidence in support of income convergence across most US states and suggests that the convergence process follows a nonlinear dynamics because of considerable variation in structure between the US states. Furthermore, Guetat and Serranito (2007) utilize unit root tests to evaluate the income convergence hypothesis for countries in the Middle East and North Africa (MENA) region. The study considers the effect of a possible break in the unit root tests and provides evidence for income convergence among MENA countries. More recently, King and Ramlogan-Dobson (2015) employ unit root tests that accommodate nonlinearities and test 18 Latin American countries for income convergence against the US benchmark. Their results report strong evidence for the income convergence hypothesis, i.e., the relative real output per capita (towards the US) of almost all Latin American economies follows a (nonlinear) trend stationary process. Ceylan and Abiyev (2016) examine the validity of income convergence for 15 European Union countries with respect to the average level of per capita

GDP of the group using both linear and nonlinear unit root tests. The linear test results show that only 3 out of 15 countries converge to the group average. By contrast, the number of converging countries increases dramatically to 9 when nonlinear unit root tests are employed.

Regarding economic integration and income convergence, early studies (Baumol, 1986; Barro, 1991; Barro and Sala-i-Martin, 1992; Mankiw et al., 1992) find that the conditions of free factor mobility and free trade are essential and contribute to the acceleration of the convergence process through the equalization of prices of goods and factors of production. More recently, studies on income convergence among countries participating in regional integration began to emerge. Fischer and Stirbock (2006) and Battisti and Vaio (2008) have studied optimal regional convergence clubs in the European Union. The primary goal of these studies is to define regional clubs sharing the same characteristics in terms of income growth convergence within the European Union. Using a cross-sectional approach, Matkowski and Prochniak (2007) find evidence in support of income convergence within the group of new EU entrants while their convergence process towards existing members seems slower. Using a time-series approach, Kocenda et al. (2006) and Ingianni and Zdarek (2009) also support income convergence among new entrants. Cavenaile and Dubois (2011) test for the existence of two separate groups of convergence within the European Union i.e. 15 Western European countries as opposed to new entrants from Eastern and Central Europe. More recently, Ito (2017) studies growth convergence with a special focus on emerging countries in Asia using panel data. The study establishes three convergence paths among Asian economies and suggests that a country can move from one convergence path to a higher one by implementing economic reforms, such as China's open-door economic reform since 1978. Feng et al. (2018) compare the contagious corruption difference

between geographic border and distance for B&R countries and find that B&R countries with a common border tend to possess contagious corruption.

3. Data and Methodology

3.1 Data

In this paper, we use annual data of the real GDP per capita (in USD) from 1960 to 2016. All data are collected from the World Bank database². This study includes sixty-five B&R countries.³ In order to test the hypothesis of income convergence towards China's real GDP per capita (GDPA) we construct the relative real GDP per capita for each country towards China, so that the series of interest for a particular country i , at time t , becomes:

$$y_{i,t} = \ln\left(\frac{g_{i,t}}{g_t^C}\right) \quad t=1,\dots,T \quad (1)$$

Where $y_{i,t}$ is the relative real GDP per capita, $g_{i,t}$ is the real GDP per capita for country i , and g_t^C is the China's GDP per capita across all countries at time t .

² GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.

³ These countries are Afghanistan, Albania, Albania, Armenia, Azerbaijan, Bangladesh, Bahrain, Belarus, Bhutan, Bosnia, Brunei, Bulgaria, Cambodia, China, Czech, Croatia, Egypt, Estonia, Ethiopia, Georgia, Hungary, Indonesia, India, Iran, Iraq, Israel, Jordan, Kazakhstan, Korea, Kuwait, Kyrgyzstan, Latvia, Laos, Lebanon, Lithuania, Macedonia, Malaysia, Maldives, Moldova, Montenegro, Mongolia, Myanmar, Nepal, New Zealand, Oman, Pakistan, Palestine, Panama, Philippines, Poland, Qatar, Romania, Russia, Saudi, Serbia, Singapore, Slovakia, South Africa, Sri Lanka, Thailand, Turkey, United Arab, Ukraine, Uzbekistan, Vietnam, Yemen.

3.2 Methodology

In this subsection, we introduce the test procedures employed to examine the income convergence hypothesis. While the univariate unit root ADF test is a standard econometric tool, there is a growing interest in utilizing nonlinear unit root tests in the literature (e.g., Lau, 2010; Lau, Suvankulov, Su, and Chau, 2012; Akhmedjonov, Lau, and Izgi, 2013, among others). Thus, we provide a brief review of these techniques in the following subsections.

3.2.1 Univariate Unit Root test

A formal test regarding income convergence can be carried out through a univariate unit root test. The Augmented Dicky- Fuller (ADF) test is traditionally used to test the stationarity of relative GDPA differential series. Suppose the data generating process (DGP) for relative GDPA differential series for country i exhibit the following dynamics:

$$y_{i,t} = \alpha_i + \theta_i y_{i,t-1} + \sum_{j=1}^{K_i} \delta_{i,j} \Delta y_{i,t-j} + \mu_{i,t} \quad t=1, \dots, T \quad (2)$$

where K_i is the number of augmenting terms and $\{u_i\}$ are white noise series independently distributed across countries, i.e. $u_i \sim id(0, \sigma_i^2)$. Rearranging equation (2) leads to the following expression:

$$\Delta y_{i,t} = \alpha_i + \beta_i y_{i,t-1} + \sum_{j=1}^{K_i} \delta_{i,j} \Delta y_{i,t-j} + \mu_{i,t} \quad t=1, \dots, T \quad (3)$$

where Δ is the first difference operator and $\beta = (\theta - 1)$. In applying the ADF test, the null hypothesis and the alternative are:

$$H_{0,ADF,i} : \beta_i = 0, \quad H_{1,ADF,i} : \beta_i < 0 \quad (i=1, 2, \dots, N)$$

The null hypothesis of non-stationarity (i.e., $H_{0,ADF,i} : \beta_i = 0$) is rejected if the relative GDPA series does not contain a unit root, and it follows the stationary process. A rejection of the null hypothesis provides evidence of income converge of B&R countries to China in the long run.

3.2.2 Nonlinear Unit Root Test

The ADF test described in the previous subsection has been criticized for lack of power in rejecting the null hypothesis, especially when the series follows a nonlinear threshold process and contains significant nonlinear components (Lau et al., 2012). Therefore we also use the nonlinear unit root test of Kapetanios et al. (2003) (thereafter, the KSS test) to test the hypothesis of income convergence when considering the effect of nonlinear components in relative GDPA differential series. The occurrence of income convergence may start only if the relative output difference reaches a certain threshold level. If this is the case, the time series is assumed to follow a nonlinear exponential smooth transition auto-regressive (ESTAR) process. The process allows for the hidden nonlinear components in time series data and provides a theoretical rationale to model the hidden market frictions, such as imperfect market structures and transportation costs. Following Kapetanios et al. (2003), we can specify the model as such:

$$\Delta y_t = \xi y_{t-1} [1 - \exp(\theta y_{t-1}^2)] + \mu_t ; \mu_t \sim IID(0, \sigma^2) \quad (4)$$

where ξ and θ are the parameters that govern the dynamics of the data generating process. Using a first-order Taylor series approximation method, Kapetanios et al. (2003) reparametrize Equation (4) as follows:

$$\Delta y_t = \phi y_{t-1}^3 + \mu_t \quad (5)$$

ϕ is the KSS test parameter, and the t-statistics could be derived from ϕ that is denoted by:

$$t_{KSS} = \frac{\hat{\phi}}{se(\hat{\phi})} \quad (6)$$

where $\hat{\phi}$ is the ordinary least squares (OLS) estimate of ϕ , and $se(\hat{\phi})$ is the associated standard error.

In absence of a unit root, the null hypothesis of non-stationarity (i.e., $H_{0,KSS,i} : \phi = 0$) is rejected, and the relative GDPA series follows the nonlinear stationary process. A rejection of the null hypothesis provides evidence of nonlinear long run income converge of B&R countries with respect to China.

4. Results and Discussion

This section provides results of income convergence tests using both the linear and nonlinear unit root methods. We test for the presence of unit root in relative per capita income differential of B&R countries with respect to China using the ADF and KSS tests. First, we use the ADF test in order to examine the convergence hypothesis for B&R countries without the consideration of any nonlinearity in the data. Second, to test nonlinear convergence, we employ the KSS test of Kapetanios et al. (2003), which considers the effect of nonlinear components in

time series. A rejection of the null hypothesis of non-stationarity in these tests provides evidence for the income convergence hypothesis.

Panel A in Table 1 summarizes the convergence results from univariate unit root tests of relative GDPA series over the full sample period (1960-2016). We find that 24 countries exhibit long-run income convergence towards China over the full sample period. The year 1978 as a milestone in contemporary China marks the beginning of the country's transition to a market economy and adoption of an open-door policy to embrace globalization. It is widely agreed that China experienced a fundamental change in its economic system after 1978. As China moved towards a market system and integrated into the global economy, we should expect some evidence in support of the income convergence hypothesis. Thus, we also employ univariate unit root tests for the post-reform period (1978-2016). Panel B in Table 1 summarizes the convergence results from univariate unit tests for the post-reform period. We report that 22 countries coverage to China during the post-reform period. However, a failure of rejecting the null hypothesis of non-stationarity does not necessarily imply the non-rejection countries are not in the process of converging. Possible nonlinearities in the data of these countries might make the standard ADF unit root test statistics biased. It is well known that the ADF test is not powerful in examining the null hypothesis of a unit root in the presence of nonlinearity in the data (Lau et al. 2012). Thus, the test tends to not reject the null hypothesis of non-convergence while it is false (i.e., there is income convergence). To take into consideration nonlinear convergence among B&R countries, we also employ the nonlinear unit root test in this study.

The summary statistics of the KSS nonlinear unit root test for B&R countries are presented in Table 2. Panels A and B report test statistics for the periods 1960-2016 and 1979-2016 respectively. The results show that 21 countries converge to China over the full sample period

(1960-2016). In addition, the number of countries converging to China increases to 24 over the post-reform period (1979-2016). The results show that the relative real output per capita (towards the China benchmark) of these countries follows a (nonlinear) mean reversion process and the underlying (nonlinear) growth paths of these economies are systematically related to that of China. We find evidence supporting the income convergence hypothesis in more B&R countries for the post-reform period than for the full sample period (1960-2016). This finding suggests that China's market transition and open-door orientation contribute to a higher degree of income convergence in regional integration. To gain additional insights in the context of China's B&R Initiatives, we break down the B&R countries into different regions, namely the Middle East and North Africa (MENA), Europe, Southeast Asia, South Asia, and Central Asia.

It is noteworthy that more countries in the Middle East and North Africa (MENA) converge to China over the post-reform period than the full sample period. The percentage of convergence is 42.86% for MENA countries over the post-reform period while the percentage of convergence for the full sample period is only 21.43%, only half of the region's post-reform percentage.

There are a total of 22 European countries participating in the B&R. These countries previously all belonged to the Eastern Bloc and experienced a transition to a market economy since the collapse of the Soviet Union. In total, 10 European B&R countries, nearly one half (45.45%), are shown to converge to China in both sample periods. This result might reflect the same experience of shifting from a command economy to a market economy that is shared by China and these former Eastern Bloc countries. 10 out of the 22 European countries in the B&R are members of the European Union. However, only 3 of these E.U. countries⁴, are shown to

⁴ namely Poland, Romania, and Slovakia

converge to China. By contrast, 7 out of the 12 non-E.U. countries in the B&R, a vast majority, are shown to converge to China. These results imply that the E.U. member countries in the B&R are mostly driven by the catch-up motivation while the non-E.U. countries in Europe participate in the B&R mostly because of the existing economic cooperation with China. This implication is consistent with the fact that E.U. membership is associated with economic integration into Western Europe. Cavenaile and Dubois (2011) show that countries within the E.U. including new entrants from the former Soviet Bloc tend to converge.

For the full sample period, there are 4 countries in South Asia that exhibit income convergence. However, for the post-reform period, the null hypothesis of a unit root cannot be rejected for 3 of them, namely India, Nepal, and Sri Lanka. The Maldives is the only country that exhibits income convergence for both periods in South Asia. This means that the countries in the region, which show convergence to China for the full sample period, tend to show no convergence to China for 1978-2016. This finding is consistent with the work of Ito (2017), which shows a widening of the income gap between Indian and China. Ito (2017) suggests that there has been a divergence between these two countries since China's market-oriented reforms in 1978. Thus, India's participation in B&R is better explained as driven by catch-up motivation. By contrast, Pakistan is the only South Asian country that shows no convergence to China for the full sample period but exhibits convergence to China for the post-reform period. This result is consistent with the strong relationship and increased bilateral economic cooperation between the two countries.

The 10 B&R countries in Southeast Asia are all members of the Association of Southeast Asian Nations (ASEAN). The number of converging countries in the region increased from 3 for the full sample period to 5 for the post-reform period. This result implies considerable

development in economic integration between China and ASEAN for the post-reform period. The 2 ASEAN countries that exhibit income convergence for the post-reform period are Singapore and Indonesia, both of which are considered by China as important economic partners. In particular, the concept of the Maritime Silk Road was first proposed by Chinese President Xi, Jinping in his formal visit to Indonesia in 2013. Hence, the results implied that Singapore and Indonesia participate in the B&R Initiative so as to improve their solid economic relationship with China.

Central Asia is a critical node in the B&R Initiative for China. The result of our study on the region is worth attention. For both sample periods, Kyrgyzstan is the only country in the region that is demonstrated to converge to China. However, Kazakhstan has been widely considered as China's most important regional partner in Central Asia.⁵ Further study is needed to explore the lack of income convergence between China and Central Asia.

5. Conclusion

We investigate the Belt & Road countries' motivations for greater economic integration with China by examining the per capita real GDP time series from 65 B&R countries. Using both linear and nonlinear unit root tests, we examine the income convergence hypothesis for B&R countries to detect the presence of economic integration for the periods 1960-2016 and 1979-2016. For the B&R countries that show income convergence to China in our testing, we argue that they tend to have strong existing economic relationship with China. Good examples from our income convergence testing include Singapore and Indonesia. By contrast, the B&R

⁵ The strategic vision of the Belt and Road Initiative was first formally proposed by President Xi Jinping in a speech delivered at Nazarbayev University during his visit to Kazakhstan in September 2013. Xi suggested that China and Central Asia cooperate to build a Silk Road Economic Belt.

countries that show no convergence to China are supposed to have a relatively weak economic relationship with China and they participate in the B&R Initiative to catch up. A good example of our finding is India. In addition, we find evidence of long-run income convergence towards China for around one-third of B&R countries in both periods and evidence that more B&R countries converge to China over the post-reform period of 1978-2016. The results suggest that China contributes to a higher degree of income convergence in regional integration. Our study is based on a widely held view among mainstream economists that is a strong link between economic integration and income convergence.⁶

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⁶ However, Milanovic (2006) finds out stronger evidence for income convergence during the interwar period than during the first globalization.

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Table 1: Summary of Univariate Unit Root Test

Panel A: 1960-2016

Country				
Armenia	Croatia	Jordan	New Zealand	Saudi
Azerbaijan	Hungary	Kazakhstan	Oman	Serbia
Bosnia	India	Moldova	Pakistan	Ukraine
Brunei	Iran	Maldives	Poland	Vietnam
Bhutan	Israel	Macedonia	Russia	

Number of instances of convergence 24

Panel B: 1978-2016

Country				
Armenia	Egypt	Kazakhstan	Oman	Ukraine
Azerbaijan	Croatia	Moldova	Poland	Vietnam
Bosnia	Hungary	Maldives	Russia	
Brunei	Iraq	Macedonia	Saudi	
Bhutan	Jordan	New Zealand	Serbia	

Number of instances of convergence 22

Table 2: Summary of KSS Unit Root Test

Panel A: 1960-2016									
Europe		MENA		Southeast Asia		South Asia		Central Asia	
Country	Statistics	Country	Statistics	Country	Statistics	Country	Statistics	Country	Statistics
Albania	-2.069	Bahrain	-2.299	Indonesia	-2.511	Afghanistan	-2.620	Kazakhstan	-2.257
Armenia	-11.962***	Egypt	-1.476	Malaysia	-1.683	Bangladesh	-3.091	Kyrgyzstan	-3.737**
Azerbaijan	-7.487***	Iran	-2.021	Philippines	-1.745	Bhutan	-2.440	Turkmenistan	-2.742
Belarus	-5.509***	Iraq	-3.018	Singapore	-1.904	India	-5.028***	Uzbekistan	-2.976
Bosnia	-18.181***	Israel	-2.002	Thailand	-1.505	Maldives	-12.596***		
Bulgaria	-2.476	Jordan	-1.261	Vietnam	-5.982***	Nepal	-3.233*		
Czech	-2.925	Kuwait	-1.562	Laos	-1.839	Pakistan	-1.448		
Croatia	-1.354	Lebanon	-6.750***	Brunei	-5.629***	Sri Lanka	-3.285*		
Estonia	-1.943	Oman	-7.583***	Myanmar	-0.898				
Georgia	-2.787	Qatar	-2.040	Cambodia	-3.469**				
Hungary	-2.165	Saudi	-4.578***						
Latvia	-2.539	Turkey	-2.529						
Lithuania	-2.271	United Arab	-3.046						
Macedonia	-3.457**	Yemen	0.067						
Moldova	-1.239								

Montenegro	-4.332***
Poland	-3.312*
Romania	-3.375*
Russia	-3.498**
Serbia	-1.805
Slovakia	-4.128***
Ukraine	-1.777

Number of instances of convergence 21

Number of instances of convergence in the region	10 countries (45.45%)	3 countries (21.43%)	3 countries (33.33%)	4 countries (50.00 %)	1 country (25 %)
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**Panel B:
1979-2016**

Europe		MENA		Southeast Asia		South Asia		Central Asia	
Country	Statistics	Country	Statistics	Country	Statistics	Country	Statistics	Country	Statistics
Albania	-2.069	Bahrain	-2.299	Indonesia	-3.746**	Afghanistan	-2.620	Kazakhstan	-2.257
Armenia	-11.962***	Egypt	-4.645**	Malaysia	-3.127	Bangladesh	-0.264	Kyrgyzstan	-3.737**
Azerbaijan	-7.487***	Iran	-3.238*	Philippines	-1.964	Bhutan	-2.440	Turkmenistan	-2.742
Belarus	-5.509***	Iraq	-1.251	Singapore	-3.399*	India	-1.303	Uzbekistan	-2.976
Bosnia	-18.181***	Israel	-2.573	Thailand	-2.262	Maldives	-12.596***		
Bulgaria	-2.476	Jordan	-2.147	Vietnam	-5.982***	Nepal	-3.030		
Czech	-2.925	Kuwait	-1.562	Laos	-1.839	Pakistan	-3.144*		
Croatia	-1.354	Lebanon	-6.750***	Brunei	-6.789***	Sri Lanka	-1.516		
Estonia	-1.943	Oman	-3.568**	Myanmar	-1.599				
Georgia	-2.456	Qatar	-2.040	Cambodia	-3.469**				
Hungary	-2.165	Saudi	-3.533**						
Latvia	-2.539	Turkey	-1.716						
Lithuania	-2.271	United Arab	-3.889**						
Macedonia	-3.457**	Yemen	0.067						
Moldova	-1.239								
Montenegro	-4.332***								

Poland	-3.312*
Romania	-3.375*
Russia	-3.498**
Serbia	-1.805
Slovakia	-4.128***
Ukraine	-1.777

Number of instances of convergence 24

Number of instances of convergence in the region	10 countries (45.45%)	6 countries (42.86%)	5 countries (50.00%)	2 countries (25.00%)	1 country (25.00%)
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Notes:

1. Asymptotic critical values of t statistics at the 1%, 5 % and 10% levels are -3.930, -3.400, and -3.130, respectively.
2. Test results for Mongolia and Korea (East Asia), Panama (Central America), New Zealand (Oceania), Ethiopia (Eastern Africa), and South Africa (Southern Africa) are statistically insignificant at the 10% level and thus not reported in the table.