

Do foreign direct investments help to bolster economic growth? New insights from Asian and Middle East economies

Mumtaz Hussain

Center for Economics Research, Shandong University, Jinan, China

Muhammad Farhan Bashir

Business School, Central South University, Changsha, China, and

Umer Shahzad

*School of Statistics and Applied Mathematics,
Anhui University of Finance and Economics, Bengbu, China*

Abstract

Purpose – The prime objective of this study is to offer fruitful implications about allocation and directing foreign direct investment (FDI) to gain maximum economic advantage. The study offers innovative findings by contributing to a new angle.

Design/methodology/approach – The study used the annual data of 24 countries, for the period of 1995–2016 and employed quantile regression and GMM as main estimation techniques. For robustness of empirical findings and to check income effect, the study divided the countries as high income, low-income panels.

Findings – Overall, the findings reported very interesting and surprising results as regional analysis. The results show the sensitivity of FDI for Middle East and high-income group of countries, inferring that there might several other factors due to which FDI is adversely affecting growth and these countries need to reform institutional quality.

Research limitations/implications – The paper is restricted for 24 countries of Asia and Middle East, based on the data availability.

Practical implications – The high-income countries should put more efforts to attract funds. The Asian and Middle East countries can update trade regulations to encourage entrepreneurs and reduce trade tariffs.

Originality/value – The present study investigated the role of FDI for economic growth in the context of Belt and Road Initiative countries of Middle East and Asian regions. The paper reviewed the past literature and identified regional analysis as a research gap to focus on Belt and Road Initiative in Asia and Middle East region.

Keywords FDI, Middle East, Asia, GDP, Belt and Road

Paper type Research paper

Abbreviations

ADB	Asian Development BankAsian Development Bank	GMM	Generalized Method of Moments
AfDB	African Development Bank	MENA	Middle East and North Africa
ARDL	Autoregressive distributed lag model	MNC	Multinational Corporation
FDI	Foreign Direct Investment	OLS	Ordinary least squares
GDP	Gross Domestic Product	VAR	Vector Autoregression
ADB	Asian Development BankAsian Development Bank	WDI	World Development Indicators



JEL Classification — C22, C23, F14, F21

The authors are grateful to anonymous referees for valuable comments and helpful suggestions. The authors declare no conflict of interest.

1. Introduction

Economic growth's association with foreign investment has been an area of interest for scholars, economists and policy analysts specifically in developing countries (Adams, 2009; Adams and Opoku, 2015; Ajide *et al.*, 2014; Almfraji and Almsafir, 2014; Anwar and Nguyen, 2010; Choe, 2003; Durham, 2004; Makiela and Ouattara, 2018; Nistor, 2014; Pegkas, 2015). Transferring assets and productivity improvement are one of several advantages of attracting the interest of foreign investors (Simionescu, 2016). Positive nature of such impact of has been testified by the previous literature (Angelopoulou and Liargovas, 2014; Baklouti and Boujelbene, 2016; Iamsiraroj, 2016; Nistor, 2014; Shah *et al.*, 2019). Foreign direct investment (FDI) helps develop emerging economies through the following channels. First, it nurtures capital accumulation as it enhances the production and exports to boost revenues (Carkovic and Levine, 2005). Second, FDI encourages technological transfers, improves human capital and economic growth (Borensztein *et al.*, 1998).

FDI is thought of as an indicator to influence macroeconomic growth by many social sciences researchers, policymakers and economists; arguing that FDI acts as fuel for boosting economic growth. Accordingly, FDI is regarded as an important vehicle through which advanced techniques, skills and ideas are transferred. As findings of the previous literature, it is inconclusive to fully comprehend the how foreign investments contribute in the growth of emerging economies and to consider its role as a positive or negative outcome on economic growth is yet to be determined for different levels of the economy. Against this backdrop, the study aims to contribute to the theoretical literature by investigating FDI-growth nexus for high income, low income of the Middle East and Asia countries. The previous studies' evidence is ambiguous and contradictory for different countries (Aurangzeb and Stengos, 2014). Another key characteristic of FDI is to increase the supply funds in the host countries, which improve the financial and economic situation. FDI also creates manufacturing mechanism, where overseas investors buy local products and sell intermediate goods to local buyers. In addition, FDI contributes to improving product quality by enhancing exports (Conconi *et al.*, 2016; Kalai and Zghidi, 2019).

Further, FDI-growth positive relationship is contingent on the several social and institutional attributes of the host nation, e.g. skilled labor, political stability, institutional quality, etc. Economic theory suggests that generally, FDI positively correlates with the economic upturn, but the causality direction is not clear. FDI inflows stimulate economic development because FDI carry positive effects in promoting sectoral growth and improve technological developments, industrial growth, labor skills and capital accumulation (Lyroudi *et al.*, 2004; Silajdzic and Mehic, 2015; Tast, 2014). Simultaneously, economic growth during macroeconomic reforms is extensively influenced by FDI (Escobar and Mühlen, 2018; Wang, 2017). Moreover, the FDI can increase employment opportunities as a further influx of domestic investment improves economic growth in the host countries (Uddin, *et al.*, 2019).

The Middle East and Asian countries need to build strong economic and investment-friendly policies to make maintainable and comprehensively improved economic growth. The economic growth for the Middle East region was at 2.8% on average in the year 2016, while some emerging and other developing countries witnessed growth at 4% approximately. The FDI in the Middle East countries was decreased by 50% since 2008, reaching the lowest level of 1% of GDP in 2015. The main reason behind this dramatic decrease was the financial crisis of 2008 (Otaviano Canuto, 2010). In addition, concerning East Asian countries, FDI accounts for 5.5% of GDP in 2016, whereas the annual GDP growth is 6.5% and in the South Asian countries, FDI calculated for 1.8% of GDP growth in 2015 by annual GDP growth is 7.6%.

The announcement of Belt and Road project by the Chinese president Xi Jinping aims at building and connecting the mainland and maritime roads of three continents for example; Asia, Europe and Africa. This is an interesting initiative as China's rank as the second-largest

economy and one of the fastest-growing countries in the 21st century bring this project into a global spotlight. The Belt and Road project aims to cover 68 countries with about 55% of the world's total GDP, 75% of known energy reserves and 70% of the global population (Du and Zhang, 2018). The present study aims to econometrically examine patterns of foreign investment patterns in two regions alongside Belt and Road such as; Asian countries and the Middle East and North Africa (MENA) (Kuo and Kommenda, 2018). Figures 1 and 2 illustrate the evolution in FDI (% of GDP) and GDP per capita of sample countries from 1995 to 2016.

This study contributes to multiple directions in the prevailing literature. First, it identifies the relationship between economic growth and FDI for Asian & Middle East countries. Second, this study analyzes the impact of foreign investment of Belt and Road [1] countries. Further, the paper provides important policy implications in the direct context of investments from Belt and Road project.

2. Intuition and interconnected literature

Makiela and Ouattara (2018) investigated how FDI encourages economic growth by applying a sample of 108 countries for the time span of 1970–2007. Findings of the research highlighted FDI's positive correlation with economic growth. Iamsiraroj (2016) examined the association amongst FDI and economic growth by employing an equation of 124 cross country data of 40 years from 1971 to 2010. The estimation results confirmed that FDI positively influences economic growth. While trade openness, economic freedom and labor force are other key determinates of FDI, which further motivates income growth. Baklouti and Boujelbene (2016) analyzed panel data of the MENA countries for the period 1998 to 2011 showing bidirectional causality between macroeconomic growth and foreign investment in the region.

Pegkas (2015) furthered the debate by empirically analyzing the effects of FDI on economic growth by applying panel data estimation in the Eurozone countries for the period 2002–2012 and suggested that FDI has a significant and positive bearing on economic growth in the Eurozone countries. Abdouli and Hammami (2017) explored the influence of FDI inflows, capital stock and environmental quality on economic growth by applying the empirical methodology of OLS, random effects and fixed effect in 17 Middle East countries from 1990 to 2012. The empirical results revealed that increases in capital stock and FDI inflows enhance growth in the host economies. Almfraji and Almsafir (2014), Nistor (2014) and Angelopoulou and Liargovas (2014) also supported similar findings. Gui-Diby (2014) inspected the impact of

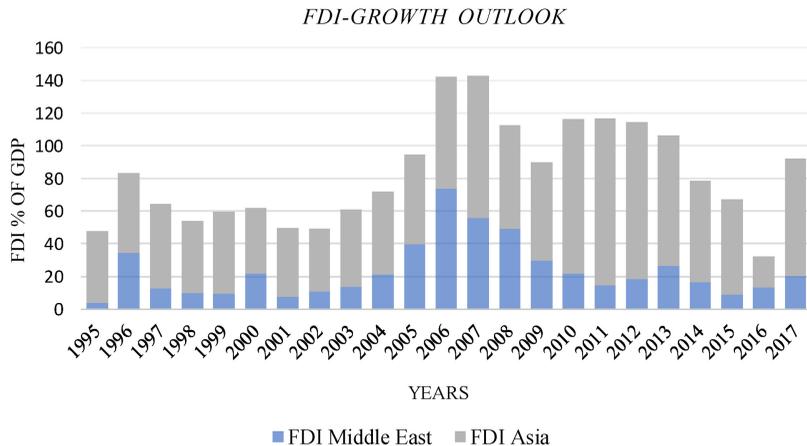


Figure 1.
Patterns of foreign direct investments as % of GDP

Source(s): World Bank, (2018)

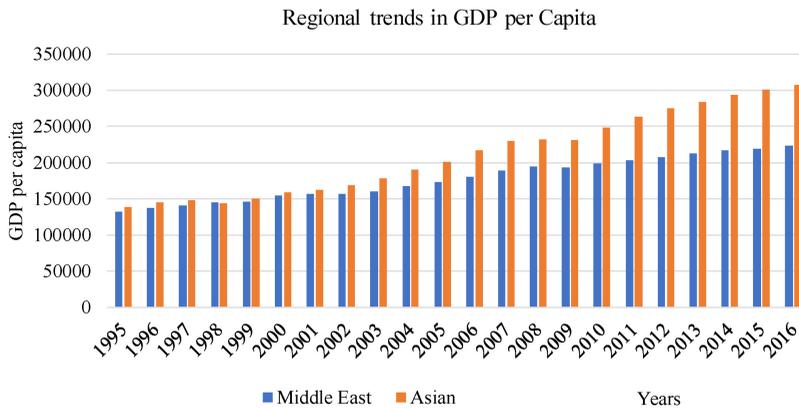


Figure 2.
Regional trends of GDP
per capita for Asian
and Middle East
countries

FDI in facilitating economic growth in the regional block of 50 African countries over the time span of 1980–2009 and supported the narrative that foreign investment is helpful in bringing structural changes in the emerging economies. [Hong \(2014\)](#) furthered this debate, employing panel data for China’s 254 prefecture-level cities, by covering the period 1994–2010. The results pointed out that FDI helps in bringing change in local infrastructure, economies of scale, human capital and wage level boost domestic growth in the regional level.

[Tiwari and Mutascu \(2011\)](#) investigated panel data of 23 Asian countries during the period of 1986–2008. The empirical analysis indicated that both exports and FDI improve economic growth. Furthermore, capital and labor are also playing an important role in Asian countries. [Anwar and Nguyen \(2010\)](#) examined the macroeconomic growth model of Vietnam by employing simultaneous equation modeling in the period 1996–2005 and suggested that higher investments in education and financial sector will integrate spillover effects. [Azman-Saini et al. \(2010\)](#) explained the role of financial market development in 91 countries for the period of 1975–2005. The results revealed that the introduction of FDI “kicks in” economic growth after financial markets surpass a threshold level. [Adams \(2009\)](#) identified the association of FDI and domestic investment in sub-Saharan countries employing fixed effects and ordinary least squares (OLS) estimations from 1990 to 2003. Data analysis suggested that domestic investment is significant and positively associated with economic development in both estimations, but the FDI is significant and positive only in OLS estimation. [Yao \(2006\)](#) conducted the effect of foreign investment to support domestic exports by applying unit root test and Arellano and Bond’s dynamic on provincial data from China for 1978–2000 indicating that domestic exports bear positive correlation with the introduction of foreign investment in all Chinese provinces.

[Carstensen and Toubal \(2004\)](#) tested the data from central European countries during the transition period to analyze the role of FDI in bringing structural changes in the sample countries. The model revealed that changes in domestic economies are encouraged by bringing reforms in traditional determinants like relative endowments, skilled workforce, low labor costs and market potential. [Alfaro et al. \(2004\)](#) investigated cross-country data from 1975 to 1995 to inspect the various links among financial markets, economic developments and FDI, and articulated that reforms in the financial sector are crucial for sustainable growth after the introduction of foreign investment. [Makki and Somwaru \(2004\)](#) examined the 66 emerging economies’ cross-section data to analyze how domestic growth is influenced by trade and FDI. Empirical findings of his research corroborated the existing literature that changes in domestic structure can sustainable after advances in trade and economic policies. [Choe \(2003\)](#) attempted to explain the causal relationship between FDI, economic growth and

domestic investment by using the VAR model over the period 1971–1995. The results explained that FDI Granger causes economic growth. In addition, the effect is more from FDI to economic growth and from economic growth to FDI, and FDI does not Granger cause economic growth. He suggested that there is a strong positive association between inflows of foreign investment and economic growth meaning high FDI inflows tend to accelerate growth. [Liu et al. \(2002\)](#) and [Borensztein et al. \(1998\)](#) stressed that FDI is vital for higher productivity in host economy as long as being accompanied by necessary changes in the structure of developing human capital.

But not all studies corroborate the positive impact of foreign investment in emerging economies. [Alvarado et al. \(2017\)](#) examined the effect of FDI on economic growth in 19 Latin American countries by applying panel data from 1980 to 2014 revealed that aggregate form is not statistically significant with the effect of FDI citing the inconsistency of results. FDI has a significant and positive effect on product in the countries with higher GDP. Meanwhile, the effect of FDI in countries with middle income GDP is not significant and portrays uneven results. In addition, the outcome of FDI in countries with lower GDP is statistically significant and negative. [Belloumi \(2014\)](#) employed ARDL test in Tunisia to investigate the impact of trade, capital investment, FD, labor and economic growth over the period 1970–2008. The results indicate co-integration among the variables where FDI is included as dependent variable as economic growth, and trade openness encourage long-term investment projects in Tunisia. However, empirical findings explained the absence of Granger causality between foreign investment and economic developments in the short run. [Herzer \(2012\)](#) and [Azman-Saini et al. \(2010\)](#) suggested that dependence of foreign investors upon the economic policies in the host economies support the idea that FDI itself does not carry direct positive association in the emerging economies. Similarly, [Durham \(2004\)](#) and [Carkovic and Levine \(2005\)](#) showed the relationship between economic growth and FDI by applying the GMM (generalized method of moments). The results explained that FDI inflows are always contingent upon domestic policies to bring long-term structural changes in the host economies.

After carefully analyzing the past and current literature, the study has noted the following research gap. First, as per the upcoming developments in Belt and Road project, we assert that the previous study lacks to offer the policies about capital spending especially FDI inflows. Against this backdrop, the paper offers fruitful policies for the Middle East and Asian countries about FDI patterns and need for better budgeting and spending on required projects. For instance, recently Bangladesh, Pakistan, Malaysia and Sri Lanka are trying to revisit their projects of Belt and Road for energy and agriculture sectors ([Dasgupta and Pasricha, 2017](#)). Second, the study sub-divided the sample countries based on respective GDPs to check whether different income levels of countries affect the FDI role for their growth or not. Previous studies have mainly focused on a single country or groups as G-8 [2] or G-20 [3] nations. Third, the paper noted that the literature lacks comparative studies of regions, while, this article applied comprehensive econometric analysis and empirical comparison of Asia and the Middle East to check the robustness and to note comparison in studied samples.

By extending the above details, our study offers the following key innovative and contribution points. First, we removed the conflicting role of FDI in economic growth by conducting econometric analysis. Second, the paper scrutinized the FDI and growth nexus for the Middle East and Asian countries alongside Belt and Road project of China, to keep in view the future inflows and investments in these countries ([Dritsakis et al., 2006](#); [Fitzová and Zidek, 2015](#); [Makki and Somwaru, 2004](#); [Zahonogo, 2016](#)). Third, the study simultaneously examines the role of FDI for economic growth as regional analysis as well as by income level of countries for proper insight and to provide policy implications as per the economic activities of these countries. Further, the article examines the FDI-growth nexus by incorporating unemployment and trade as key policy factors for the economic growth of the Middle East and Asian countries.

3. Data and methods

3.1 Data specification

The study analyzes the influence of FDI on economic growth in 24 economies of Asia and the Middle East and North Africa (MENA) regions alongside Belt and Road [4]. The paper further divided the countries as high income, low-income regions to examine the income effects on FDI role to affect economic growth. The regions, panels and countries list is provided in Table A1 (Appendix). The study gathered data on domestic investment, economic growth, inflation, population unemployment and FDI from World Development Indicators [5] (WDI), an authentic data server of World Bank, covering the period 1995 to 2016 (World Bank, 2019). For the case of Asian and MENA regions, World Bank finalizes macroeconomic data from Asian Development Bank (ADB), African Development Bank (AfDB) and central banks of respective countries. The World Development Bank records, monitors and reports all the data and provides in the similar standard at the database for the researchers and economic institutions. The data for FDI are taken in million dollars current US \$, GDP is taken as GDP per capita, unemployment is taken as unemployment % of the total, inflation is taken as a GDP deflator, gross fixed capital formation current US\$ and population is taken as population total. Table 1 presents the descriptive statistics of all the variables, inferring that all variables have normality and pose no outliers in the data. Table 2 illustrates the variables' narrative and data sources for studied variables.

3.2 Empirical modeling

The present study aims to examine the impact of FDI toward economic growth for Asian [6] and Middle East countries alongside Belt and Road. The motivation behind this selection is that China is investing in FDI and negotiating trade agreements for Asian countries as well as in Middle East countries (Huang, 2019). For this purpose, we incorporated domestic investments, trade, unemployment, inflation and population as controlling factors for the model. In order to avoid mathematical concerns, we transformed GDP, gross fixed capital formation, FDI, population and inflation into natural logarithm. The panel ordinary least square and quantile regression model is presented as;

$$G_{i,t} = f(\text{FDI}_{i,t}, \text{GFC}_{i,t}, \text{INF}_{i,t}, \text{UNEMP}_{i,t}, \text{TRADE}_{i,t}, \text{POP}_{i,t}) \quad (1)$$

$$G_{i,t} = \beta_0 + \beta_1 \text{FDI}_{i,t} + \beta_2 \text{GFC}_{i,t} + \beta_3 \text{INF}_{i,t} + \sum_{g=1}^4 W_g Z_{g,i,t} + \mu_{i,t} \quad (2)$$

whereas $G_{i,t}$ denotes the economic growth $\text{FDI}_{i,t}$ represents the FDI $\text{GFC}_{i,t}$ shows the gross fixed capital formation $\text{INF}_{i,t}$ indicates the inflation $Z_{g,i,t}$ presents the control variables (unemployment, trade and population) and $\mu_{i,t}$ represents the error term of the regression model. Eqn (2) presents a linear form of regression.

	LNGDP	LNFDI	LNGFC	LNPOP	TRADE	UNEMP
Mean	9.022	20.979	23.39	16.95	95.522	6.190
Median	8.850	21.251	23.67	17.01	79.592	4.56
Maximum	11.39	26.396	29.20	21.04	441.60	19.83
Minimum	6.685	10.819	18.68	12.60	22.167	0.161
Std. Dev	1.171	2.4164	2.002	2.116	70.093	4.5558
Skewness	0.264	-0.553	0.093	-0.0955	2.5232	1.1614
Kurtosis	2.084	3.556	2.928	2.495	10.683	3.5607
Jarque-Bera	24.59	30.93	0.886	6.392	1859.2	125.63
Observations	528	528	528	528	528	528

Table 1.
Descriptive statistics

Table 2.
Variables narrative
and data sources

Variables	Presentation	Elaboration	Source	Status
Economic Growth	GDP	GDP per capita	World Bank	Dependent Variable
Foreign direct investment	FDI	Foreign direct investment (current US\$)	World Bank	Independent Variables
Capital formation	GFC	Gross fixed capital formation (current US\$)	World Bank	
Inflation	INF	Inflation, GDP deflator (annual %)	World Bank	Independent Variables
Unemployment	UNEMP	Unemployment total (National estimate %)	World Bank	
Trade openness	TRADE	Trade (% of GDP)	World Bank	Independent Variables
Population	INPOP	Total Population, in millions	World Bank	

The main motivation behind the selection of domestic capital and trade is explained due to the fact that the domestic capital formation and the business in a host country contribute positively to economic growth. Trade is a broad term, which has two perspectives, exports and imports. However, in the present study, trade is included to check economic openness and trade restrictions. The population is considered as a determinant of positive growth and is considered in the model to control for any unemployment shocks (Banda *et al.*, 2016; Shayanewako, 2018; Suleiman *et al.*, 2017). While, inflation is taken to check for economic fluctuations (Kalai and Zghidi, 2019; Oztürk *et al.*, 2014). We classify sample countries based on GDP under which 11 countries fall in high and upper-middle income and 13 countries fall in low income (World Bank, 2019).

This study employed pooled OLS, quantile regression and system generalized method of moment (SGMM) introduced by Arellano and Bond (1991) which considers auto-regressive (1) model and auto-regressive (2) with separate individual unobserved specific factors. The study used the GMM due to the following advantages over traditional panel data techniques. (1) First, the GMM model considers all the endogeneity issues in explanatory variables by using the instrumental values of variables and controlling for omitted variables. (2) Second, the GMM model controls for economic growth, as the principles for the determination of economic growth method. The data consist of 24 countries ($N = 24$) and covers a period of 22 years ($T = 22$).

$$G_{i,t} - G_{i,t-1} = \beta_1(FDI_{i,t-\tau} - FDI_{i,t-2\tau}) + \beta_2(GFC_{i,t} - GFC_{i,t-\tau}) + \beta_3(INF_{i,t} - INF_{i,t-\tau}) + \sum_{g=1}^4 W_g(Z_{g,i,t} - Z_{g,i,t-2\tau}) + (\mu_{i,t} - \mu_{i-\tau}) + \varepsilon_{i,t-\tau} \quad (3)$$

$$\Delta G_{i,t} = \beta_1 \Delta FDI_{i,t-\tau} + \beta_2 \Delta GFC_{i,t-\tau} + \beta_3 \Delta INF_{i,t-\tau} + \sum_{g=1}^4 W_g \Delta Z_{g,i,t} + \Delta \mu_{i,t} \quad (4)$$

4. Empirical results and discussion

4.1 Full panel estimations

For empirically analyzing the role of economic growth and FDI for the Full panel, Asian and Middle East countries, High income, Low income, the study has employed GMM, pooled OLS and quantile regression. The empirical findings concerning each model and different panels are explained below. Table 3 presents the empirical regression for full panel dataset.

The pooled (OLS) and quantile regressions indicate that FDI has an insignificant relationship with economic growth for panel estimations. This is not surprising as most Asian and the Middle East countries FDI inflows are channeled mainly to the sectors which do not have an association with other factors of the domestic economy (Adams and Opoku, 2015). Bureaucratic corruption, poor domestic infrastructure and lack of higher education also contribute in this regard (Angelopoulou and Liargovas, 2014; Mencinger, 2003; Tanggapan *et al.*, 2011). Meanwhile, the existence of significant and positive relationship running between economic growth and domestic investment in both models for the full panel means domestic economies also play an integral role in advancements of economic agendas in developing economies. Moreover, trade and inflation have an insignificant association with economic growth in both econometric models in these countries.

Moreover, unemployment has a constructive and statistically significant relationship with economic growth in both models in these countries. The population is proved as a significant negative indicator for economic growth for both regressions. These results highlight the absence of long-term planning for the population such as; education and health facilities, job opportunities, etc. (Behname, 2012). Figure A1 (Appendix) presents the quantile estimations for the full panel in graphical form. The linear line suggests a stable impact, while the upper side shadow highlights the positive and lower side shows the negative impact of explanatory variables. The graphics results are similar to regression estimations.

4.2 Quantile regression extended

Table 4 presents the empirical estimations for the full panel at 20th quantile, 50th quantile and 80th quantile for sample economies. Empirical analysis result reveals that there is an insignificant affiliation between economic growth & FDI at 20th and 50th in the quantile full panel (Abbes *et al.*, 2015; Adams and Opoku, 2015; Alfaro *et al.*, 2004; Mencinger, 2003). However, 80th quantile of the regression analysis highlights positive association. The finding indicates that FDI's ability to influence the outcomes of economic growth. Not only FDI incorporates new industries and employment opportunities but also improves the social standard of people (Bengoa and Sanchez-Robles, 2003; Kottaridi *et al.*, 2019; Liu *et al.*, 2002; Tiwari and Mutascu, 2011).

Furthermore, the result indicates that there is a significant and positive relationship between domestic investment and economic growth at 20th, 50th and 80th quantile regressions. On the other side, the result shows that domestic investment increases economic growth for quantile full panel. Meanwhile, economic growth has a significant and positive affiliation with inflation at 20th quantile regression and there is an insignificant relationship

Variables	Pooled OLS	Quantile regression
FDI	0.0189 (1.1400)	-0.0252 (-1.2600)
GFC	0.6682*** (47.3200)	0.7342*** (25.5800)
INF	0.0002 (0.0500)	0.0011 (0.3500)
UNEMP	0.0323*** (8.3600)	0.0283*** (4.8800)
TRADE	0.0002 (0.5800)	0.0005 (1.0300)
INPOP	-0.7275*** (-48.2900)	-0.7504*** (-34.9100)
CONS	5.0880*** (30.0800)	4.8443*** (15.3900)
T	22	22
N	24	24
Obs	528	528
P(F)	0.0000	0.0000
R ²	0.9120	0.7141

Note(s): *, **, *** represents the level of significance at 10%, 5% and 1% respectively

Table 3.
Full panel empirics

Table 4.Quantile regression
extended in quantiles
(Full panel estimations)

Variables	Q20	Q50	Q80
FDI	0.0126	-0.0252	0.0423**
GFC	0.6240***	0.7342***	0.6613***
INF	0.00057**	0.0011	-0.0025
UNEMP	0.0381***	0.0283***	0.0348***
TRADE	0.0016***	0.0005	-0.0010**
INPOP	-0.6394***	-0.7504***	-0.7873***
CONS	4.2250***	4.8443***	6.2068***
<i>T</i>	22	22	22
<i>N</i>	24	24	24
Obs	528	528	528
Pseudo <i>R</i> ²	0.7110	0.7141	0.7346

Note(s): *, **, *** represents the level of significance at 10%, 5% and 1% respectively

between inflation and economic growth at 50th and 80th for these countries. Unemployment bears a noteworthy and positive structure with economic growth at 20th, 50th and 80th quantile. The results are very surprising unemployment contributes to lower economic growth.

Moreover, the result from data analysis articulate that there is a significant and positive affiliation between economic growth and trade at the 20th quantile, indicating that if trade increases in these countries, economic growth will increase. Meanwhile, the result reveals that at 50th quantile indicate negative association for the whole dataset. However, the relationship between trade and economic growth at 80th quantile is significant and negative meaning at the 80th quantile trade adversely affects economic growth in these countries. However, there is a significant and negative relationship between growth in the domestic economy and population at all quantiles, indicating that if the population increases, economic growth decreases (Behname, 2012).

4.3 Regional analysis

Table 5 shows the empirical estimations for Asian and the Middle East countries by applying quantile and pooled OLS and regression analysis. Data analysis for quantile regression and pooled OLS illustrates a significant and positive association for economic growth and FDI in Asian countries. Furthermore, FDI is helpful in bringing technology to transform means of production for domestic partners (Anwar and Nguyen, 2010; Baklouti and Boujelbene, 2016; Borensztein *et al.*, 1998; Liu *et al.*, 2002). However, there is an insignificant relationship for the Middle East and North African countries. The insignificant effect is due to the political instability, lack of reforms for development in financial markets and institutional corruption in these countries. (Adams, 2009; Iamsiraroj and Ulubaşoğlu, 2015; Mencinger, 2003; Nasir *et al.*, 2019; Tanggapan *et al.*, 2011).

Furthermore, the result confers that there is a significant and positive relationship between investment and economic growth for both regressions in both regions, which shows that domestic investment assists economic growth in the Asian and Middle East countries. Moreover, there is an insignificant linkage between inflation, trade and economic growth for both regressions in both regions. Data findings also specify that unemployment has a constructive attribution with economic growth for both regressions. On the one hand, unemployment has a significant and negative relationship with economic growth for pooled OLS in the Middle East countries meaning lower unemployment leads to economic developments in the region. On the other hand, an insignificant relationship exists between unemployment and economic growth for quantile regression in the Middle East countries.

Variables pooled OLS	Quantile regression			
	Asian	Middle East	Asian	Middle East
FDI	0.0600*** (4.2600)	-0.0367 (-1.2400)	0.0594*** (2.7400)	-0.0341 (-1.0800)
GFC	0.6188*** (36.0900)	0.6078*** (13.2700)	0.6322*** (20.5400)	0.6822*** (12.3200)
INF	-0.0021 (-0.6100)	-0.0006 (-0.2500)	-0.0016 (-0.4400)	-0.0007 (-0.1700)
UNEMP	0.0624*** (5.1700)	-0.0082*** (-2.7300)	0.0651*** (5.2200)	-0.0063 (-0.6100)
TRADE	0.0001 (0.3800)	-0.0021 (-1.7400)	0.0001 (0.1900)	-0.0004 (-0.1600)
INPOP	-0.7220*** (-26.0700)	-0.6652*** (-18.8700)	-0.7355*** (-31.4300)	-0.6428*** (-12.5800)
CONS	5.1756*** (33.3500)	7.3364*** (6.5900)	5.1123*** (17.3400)	4.9993*** (3.7300)
T	22	22	22	22
N	16	8	16	8
Obs	352	176	352	176
F(F)	0.0000	0.0000		
R ²	0.9208	0.8540	0.7172	0.6483

Note(s): *, **, *** represents the level of significance at 10%, 5% and 1% respectively

Moreover, the population is proved as a significant negative indicator for economic growth for pooled OLS and quantile regression in both regions, inferring that if population increases, growth decreases. This is due to the fact that these countries have yet to implement meaningful policies to utilize labor. [Figures A2 and A3](#) (Appendix) show the quantile graphs for Asian and Middle East countries. The linear line recommends a stable impact, while the upper side shadow highlights the positive and lower side shows the negative impact of explanatory variables. The graphics results are similar to regression estimations.

4.4 Full panel and regional analysis with (SGMM)

[Table 6](#) presents the SGMM estimation for regional analysis for full panel, Asian region and the Middle East countries. Overall, the data analysis dictates that there is a significant and positive relationship running from FDI toward economic growth. ([Aurangzeb and Stengos, 2014](#); [Doytch, 2015](#); [Leitão and Rasekhi, 2013](#); [Li and Liu, 2005](#); [Mihalache-O’Keef, 2018](#)). Asian region and low-income judging from the size of estimates, it is easier to interpret that the magnitude of foreign investment in developing countries is of much larger nature when the whole sample is considered. Further, FDI proved a significant and negative effect on economic growth in the Middle East countries. These empirical findings are very surprising, as it indicates that FDI should be carefully utilized. The proper spending of foreign inflows might affect the industry, employment level and economic growth positively or vice versa ([Trojette, 2016](#)).

GMM results also show the existence of a significant and positive relationship running between economic growth and domestic investment for full panel, Asian and Middle East regions. Moreover, inflation proved an insignificant affiliation with economic growth for full panel and Middle East region and it has a significant and negative relationship for the Asian region. Additionally, unemployment has a significant and positive relationship with economic growth for full panel and the Asian region and negative relationship for the Middle East region. And trade bears a positive relationship with economic growth for full panel and an insignificant relationship for Asian and it has a significant negative relationship for the Middle East region. The population has a significant and negative relationship with economic growth for full panel, Asian and Middle East regions.

4.5 Robust estimations with dynamic models

[Table 7](#) reports the estimations for time-lagged of economic growth with the system GMM technique. The main motivation behind the lagged effect is that in FDI and growth nexus there are chances that FDI can be an endogenous factor, or it can be a reverse casualty.

Variables	Full panel	Z-value	Asian region	Z-value	Middle East	Z-value
FDI	0.0144***	5.0600	0.0620***	15.6300	-0.0413***	-9.6600
GFC	0.6782***	157.5100	0.6111***	106.0900	0.6206***	82.2400
INF	-0.0003	-0.6000	-0.0042***	-5.5300	-0.0009	-1.5400
UNEMP	0.0301***	37.0800	0.0653***	26.5100	-0.0072***	-5.0400
TRADE	0.0001**	2.0500	0.0001	1.6400	-0.0018***	-5.8600
INPOP	-0.7334***	-246.1900	-0.7176***	-167.6200	-0.6660***	-96.0600
CONS	5.0682***	113.8700	5.2397***	96.5800	7.1159***	39.0100
Ar(2)	0.012		0.024		0.998	
Ar(1)	0.345		0.900		0.529	
P(Sar.)	0.000		0.000		0.000	

Note(s): Coefficient estimates at 10%, 5% and 1% Respectively *, **, ***

Table 6.
GMM estimations for regional analysis

Table 7.
Dynamic models with
time-lagged
effect (SGMM)

Variables	Full panel	Middle East	Asian region
GDP _{t-1}	0.9660*** (284.34)	1.0005*** (138.37)	0.9501*** (240.89)
FDI	0.0536*** (4.9100)	0.0527*** (2.9500)	0.0899*** (6.6300)
GFC	0.0150*** (5.3300)	-0.0986*** (-1.8100)	0.0252*** (8.2000)
INF	0.0544*** (3.3400)	0.0489* (2.0500)	0.0746*** (3.1600)
UNEMP	-0.0536* (-1.7800)	-0.0303 (-0.5400)	0.0179** (2.3600)
Trade	0.0236 (1.0500)	-0.0663 (-0.5300)	-0.0255 (-1.0100)
POP	-0.0178*** (-6.5200)	0.0625 (1.1200)	-0.0330*** (-10.5100)
CONS	0.1889 (8.2600)	0.0493 (0.5500)	0.2718 (10.3100)
AR(1)	-5.09***	-4.22***	-1.86**
AR(2)	-4.05***	-1.06	-4.37***
P(Sargan)	0.77	0.89	0.68

Note(s): *, **, *** represents the level of significance at 10%, 5% and 1% respectively

The increase in economic progress can help to attract foreign institutional investors and MNCs as economic growth is viewed as a sign of a healthy economy. Similarly, the inward FDI flows can increase or decrease the productivity levels in developing economies depending on the utilization of several domestic factors such as industrialization, technology, etc. However, the solution of endogeneity problem proposed by several researchers (Al-Badarneh, 2016; Asongu *et al.*, 2018; Guimón *et al.*, 2018) is to use the lagged regressors and employ system GMM or difference GMM technique. Asongu *et al.* (2018) have also proposed that the use of lagged regressors as instruments can help as a counter effect for endogeneity issues. Therefore, system GMM technique with forward differenced variables as instruments were employed in our empirical estimations for time-lagged effects. The lagged economic growth values report significant positive effects on current year growth, indicating that previous year economic progress has a strong impact on the current year's economic growth. These estimates are comparable for the case of the Middle East and Asian regions. Overall, the results indicate that FDI contributes to improving economic growth for the Middle East as well as for Asian countries. We find the consistent and similar response of control variables as in our main findings.

The empirical and statistical findings indicate an insignificant linkage between economic growth and FDI, a strong positive association between economic growth and domestic investment, an insignificant relationship between inflation and trade with economic growth, a strong positive relationship between unemployment and economic growth and a strong negative relationship between population and economic growth for the full panel. Therefore, the results obtained for the full panel suggest that FDI has not been associated with positive economic growth demonstrating political instability, corruption and institutional quality are hindering the progress in the economy. The slow-moving privatization process, inadequate infrastructure and an unskilled labor force are among secondary influencers (Rahman, 2015).

The empirical result indicates data analysis for Asian countries suggest a positive relationship between economic growth and foreign investment but an insignificant negative for Middle East dataset, a strong positive relationship between economic growth and domestic investment for Asian and Middle East countries, an insignificant relationship between economic growth and trade for Asian countries and an insignificant negative association between trade and economic growth for the Middle East countries. Inflation negatively affects the purchasing power of common people. The present study highlights the insignificant affiliation between trade and FDI for Middle East countries in all empirical estimations (Abdel-Latif, 2019). The empirical estimations reveal that FDI and domestic investments are very important factors for Asian countries as the manufacturing sector is at the core for economic policies for the region, also developments in human capital, degree of

the technological gulf amongst the local firm and foreign business entities and deficiencies in the monetary sector.

4.6 Income wise robustness

Table 8 shows the GMM estimations for Income wise group analysis for high-income and low-income countries. The outcome specifies that FDI proved a significant and negative effect on economic growth for the high-income group of countries. The negative trends of economic growth's association between FDI is down to the existence of political instability, unskilled workforce and energy crises (Mahmoodi and Mahmoodi, 2016). However, FDI has a significant and positive relationship for low-GDP countries. This is justified by the importance of FDI in transferring technology and skills as well as capital inflows to access new market (Akhtaruzzaman et al., 2017; Haydaroglu, 2016; Leitão and Rasekhi, 2013; Mullen and Williams, 2005; Petri, 2012). However, there is a positive and significant relationship between domestic investment and economic growth for countries with high and low-GDP. Inflation has a significant and positive association with economic growth for high-income countries and an insignificant relationship with economic growth for low-income countries.

Moreover, unemployment has a significant and negative affiliation with economic growth for high-income countries and it has a positive relationship in the case of low-income countries. The analysis also indicates toward the existence of an insignificant relationship among economic growth and trade for high-income countries and a significant and negative for low-income countries. It is also of importance that the population bears an insignificant relationship with the whole dataset. A higher population generates economic growth or vice versa.

The study also submits that Asian countries have not addressed political issues so that they can address the lack of investments in developments of human resources that would ensure that the impact of foreign investment is of lasting nature. The empirical estimation suggests that Asian countries need to bring sustainable reforms in financial sectors for the long term (Thangavelu et al., 2009). The empirical estimations show that a strong significant negative association between FDI and economic growth for high income and a strong significant positive association for low-income countries. Notably, the paper identifies a substantial and positive relationship between domestic investment and economic growth for countries with high and low-GDPs. Unemployment proved as a significant negative indicator for the growth of high income and low-income countries, indicating that the increase in youth affects the economic growth adversely (Watson and Deller, 2017). This is due to the reason that the population growth rate of studied countries is very high, while they have limited resources to accommodate economic progress. This further leads to the idea that these

Variables	High income	Z-value	Low income	Z-value
FDI	-0.0749***	-15.130	0.0688***	15.830
GFC	0.6639***	77.080	0.5486***	77.460
INF	0.0022***	3.2100	0.0004	0.4800
UNEMP	-0.0088***	-6.560	0.0554***	35.1300
TRADE	0.0089	-0.330	-0.0879***	-4.9500
INPOP	-0.7477***	-123.17	-0.6064***	-103.580
CONS	7.9204***	80.23	4.6444***	58.3000
Ar(1)	0.421		0.493	
Ar(2)	0.550		0.766	
P(Sar.)	0.000		0.003	

Table 8.
GMM Estimations for
income wise group
analysis

Note(s): Coefficient estimates at 10%, 5% and 1% Respectively *, **, ***

countries need massive reforms to fully utilize socio-economic resources and foreign investments to eliminate poverty.

5. Discussion and concluding remarks

This paper aimed to analyze the effect of FDI on economic growth for 24 member countries of Belt and Road, which consists of 16 Asian and 8 Middle East countries for the period of 1995–2016. The study analyzes FDI patterns and their role for the economy to suggest effective policies for involvement in Belt and Road project. We relied upon [World Bank \(2017\)](#) for dataset to produce empirical estimations by employing three models just as; quantile regression pooled OLS and GMM for the case of the full panel, Asian panel, Middle East countries, high income and low-income countries. The empirical estimations for full panel revealed that FDI carries insignificant impact over economic growth in these countries. The insignificant relationship indicates that most Asian and the Middle East countries, inflows of foreign investment are channeled mainly to the extractive sectors which do not have linkage with other factors of the domestic economy.

The empirical estimation for quantile regression specified that foreign investment has an only significant association with economic growth at 80th quantile regression as FDI carry positive influence over economic growth. Because of FDI, new industries get finance and rise in domestic investment result in employment opportunities in these countries. FDI boosts domestic economies in these countries by enhancing more industries and firms. The empirical estimations for Asian and Middle East countries revealed that FDI has significant linkage with economic growth in the Asian countries and it has an insignificant relationship for Middle East countries. The insignificant relationship in these countries due to the high rate of corruption and political instability as a lack of spending in infrastructure, education and industries are core issues yet to be resolved. Numerical estimates also indicate that FDI facilitates the transfer of technology, skills and capital inflows in the host economies, which advances economic growth. Meanwhile, the empirical estimations for unemployment, population and trade reported a negative effect on economic growth, indicating that there might be some domestic socio-economic problems. However, the Middle East countries need more in-depth analysis to cater to these problems. Moreover, countries should implement policies to better integrate domestic and foreign investments.

The empirical estimations for high-income countries indicated that FDI bears negative affiliation with economic growth highlighting the need to enhance exports. While the empirical estimations for low-income countries showed that carries positive relationship with economic growth acknowledges foreign investment can facilitate macroeconomic reforms. GMM estimations show foreign investment has a positive association with economic growth for the full panel, the Asian region and low-income countries indicating that FDI contributes economic growth in these countries. The GMM estimations also show that FDI carries a negative relationship with economic growth for the Middle East, high-income countries. This shows that FDI has not been able to transform these economies, which can be attributed to bureaucratic hurdles, lack of trade openness, poor infrastructure and low level of education. In addition, these countries need to bring changes in policymaking so that domestic partners of MNCs are able to take advantage of working with them.

After carefully analyzing the empirical results the study suggests taking the following key measures as a broad perspective for all sampled countries. The developing economies need to reform trade and capital restriction policies in order to attract more investments. In addition, the paper recommends introducing new policies for poverty and unemployment elimination. Furthermore, some domestic institutional problems can be investigated in the future to check if the investments are utilized for desired objectives or not. Regarding Asian and low-income countries, the paper provides the following key recommendations. First,

these countries should focus on utilization of foreign and domestic investments to accommodate economic growth. Among Asian countries, some countries such as; Pakistan, Bangladesh, Bhutan, etc. have the golden chance to benefit from Belt and Road project and to increase their exports in the region. Second, long-term economic measures should be taken to mitigate the inflation and unemployment problems by improving human resource levels.

Similarly, for high-income countries, trade and population are significantly reducing economic growth. This finding is very surprising and innovative, and the study recommends that these countries should focus on improving exports and reducing imports, while at the same time focusing on opening borders for trade and by providing subsidies to certain sectors. Concerning domestic capital and foreign investments, the high-income countries should put more efforts to attract funds. Lastly, the high-income countries can update trade regulations to encourage entrepreneurs and reduce trade tariffs.

Notes

1. We have taken 24 countries of Belt and Road projects, which consist of 8 Middle East countries and 16 Asian countries.
2. G8 is a group political forum which includes 8 countries, namely France, Germany, Italy, Japan, the United Kingdom and the United States.
3. G20 is a group political forum which includes European countries and China, India, Japan, Saudi Arabia, the US and Turkey.
4. The countries are selected as per the list of Belt and Road project, provided as follows; https://www.fbicgroup.com/sites/default/files/B%26R_Initiative_65_Countries_and_Beyond.pdf
5. World Bank data is accessed from <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#>
6. Asian region means the all Asian countries including East and South Asian countries which are total 21 as per World Bank. The paper selected only 16 countries belt and road countries.

References

- Abbes, S.M., Mostéfa, B., Seghir, G. and Zakarya, G.Y. (2015), "Causal interactions between FDI, and economic growth: evidence from dynamic panel co-integration", *Procedia Economics and Finance*, Vol. 23, pp. 276-290.
- Abdel-Latif, H. (2019), "FDI response to political shocks: what can the Arab Spring tell us?", *Journal of Behavioral and Experimental Finance*, Vol. 24, 100233.
- Abdouli, M. and Hammami, S. (2017), "The impact of FDI inflows and environmental quality on economic growth: an empirical study for the MENA countries", *Journal of the Knowledge Economy*, Vol. 8 No. 1, pp. 254-278.
- Adams, S. (2009), "Foreign direct investment, domestic investment, and economic growth in sub-Saharan Africa", *Journal of Policy Modeling*, Vol. 31 No. 6, pp. 939-949.
- Adams, S. and Opoku, E.E.O. (2015), "Foreign direct investment, regulations and growth in sub-Saharan Africa", *Economic Analysis and Policy*, Vol. 47, pp. 48-56.
- Ajide, K., Adeniyi, O. and Raheem, I. (2014), "Does governance impact on the foreign direct investment-growth nexus in sub-Saharan Africa?", *Zagreb International Review of Economics and Business*, Vol. 17 No. 2, pp. 71-81.
- Akhtaruzzaman, M., Berg, N. and Hajzler, C. (2017), "Expropriation risk and FDI in developing countries: does return of capital dominate return on capital?", *European Journal of Political Economy*, Vol. 49, pp. 84-107.

- Al-Badarneh, K.M. (2016), *The Role of Macro-Marketing Environmental Factors in Attracting Foreign Direct Investment: Empirical Study at Qualified Industrial Zones (QIZ) in Jordan*, Zarqa University.
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S. and Sayek, S. (2004), "FDI and economic growth: the role of local financial markets", *Journal of International Economics*, Vol. 64 No. 1, pp. 89-112.
- Almfraji, M.A. and Almsafir, M.K. (2014), "Foreign direct investment and economic growth literature review from 1994 to 2012", *Procedia-Social and Behavioral Sciences*, Vol. 129, pp. 206-213.
- Alvarado, R., Iñiguez, M. and Ponce, P. (2017), "Foreign direct investment and economic growth in Latin America", *Economic Analysis and Policy*, Vol. 56, pp. 176-187.
- Angelopoulou, A. and Liargovas, P. (2014), "Foreign direct investment and growth: EU, EMU and transition economies", *Journal of Economic Integration*, Vol. 29, pp. 470-495.
- Anwar, S. and Nguyen, L.P. (2010), "Foreign direct investment and economic growth in Vietnam", *Asia Pacific Business Review*, Vol. 16 Nos 1-2, pp. 183-202.
- Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The Review of Economic Studies*, Vol. 58 No. 2, pp. 277-297.
- Asongu, S., Akpan, U.S. and Isihak, S.R. (2018), "Determinants of foreign direct investment in fast-growing economies: evidence from the BRICS and MINT countries", *Financial Innovation*, Vol. 4 No. 1, p. 26.
- Aurangzeb, Z. and Stengos, T. (2014), "The role of foreign direct investment (FDI) in a dualistic growth framework: a smooth coefficient semi-parametric approach", *Borsa Istanbul Review*, Vol. 14 No. 3, pp. 133-144.
- Azman-Saini, W., Baharumshah, A.Z. and Law, S.H. (2010), "Foreign direct investment, economic freedom and economic growth: international evidence", *Economic Modelling*, Vol. 27 No. 5, pp. 1079-1089.
- Baklouti, N. and Boujelbene, Y. (2016), "Foreign direct investment-economic growth nexus", *Acta Universitatis Danubius: Oeconomica*, Vol. 12 No. 2, pp. 136-145.
- Banda, H., Ngirande, H. and Hogwe, F. (2016), "The impact of economic growth on unemployment in South Africa: 1994-2012", *Investment Management and Financial Innovations*, Vol. 13 No. 2, p. 246.
- Behname, M. (2012), "Foreign direct investment and economic growth: evidence from Southern Asia", *Atlantic Review of economics*, Vol. 2, pp. 1-15.
- Belloumi, M. (2014), "The relationship between trade, FDI and economic growth in Tunisia: an application of the autoregressive distributed lag model", *Economic Systems*, Vol. 38 No. 2, pp. 269-287.
- Bengoa, M. and Sanchez-Robles, B. (2003), "Foreign direct investment, economic freedom and growth: new evidence from Latin America", *European Journal of Political Economy*, Vol. 19 No. 3, pp. 529-545.
- Borensztein, E., De Gregorio, J. and Lee, J. (1998), "How does foreign Direct Investment affect economic growth?", *Journal of International Economics*, Vol. 45 No. 1, pp. 115-135.
- Carkovic, M. and Levine, R. (2005), "Does foreign direct investment accelerate economic growth?", *Does Foreign Direct Investment Promote Development*, p. 195.
- Carstensen, K. and Toubal, F. (2004), "Foreign direct investment in Central and Eastern European countries: a dynamic panel analysis", *Journal of Comparative Economics*, Vol. 32 No. 1, pp. 3-22.
- Choe, J.I. (2003), "Do foreign direct investment and gross domestic investment promote economic growth?", *Review of Development Economics*, Vol. 7 No. 1, pp. 44-57.
- Conconi, P., Sapir, A. and Zanardi, M. (2016), "The internationalization process of firms: from exports to FDI", *Journal of International Economics*, Vol. 99, pp. 16-30.

- Dasgupta, S. and Pasricha, A. (2017), *Pakistan, Nepal, Myanmar Back Away from Chinese Projects*, Voice of America.
- Doytch, N. (2015), "Sectoral FDI cycles in south and East Asia", *Journal of Asian Economics*, Vol. 36, pp. 24-33.
- Dritsakis, N., Varelas, E. and Adamopoulos, A. (2006), "The main determinants of economic growth: an empirical investigation with Granger causality analysis for Greece", *European Research Studies Journal*, Vol. 9 Nos 3-4, pp. 47-58.
- Du, J. and Zhang, Y. (2018), "Does one belt one road initiative promote Chinese overseas direct investment?", *China Economic Review*, Vol. 47, pp. 189-205.
- Durham, J.B. (2004), "Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth", *European Economic Review*, Vol. 48 No. 2, pp. 285-306.
- Escobar, O. and Mühlen, H. (2018), "The role of FDI in structural change: evidence from Mexico", Hohenheim Discussion Papers in Business, Economics and Social Sciences No. 22-2018.
- Fitzová, H. and Zidek, L. (2015), "Impact of trade on economic growth in the Czech and Slovak Republics", *Economics and Sociology*, Vol. 8 No. 2, p. 36.
- Gui-Diby, S.L. (2014), "Impact of foreign direct investments on economic growth in Africa: evidence from three decades of panel data analyses", *Research in Economics*, Vol. 68 No. 3, pp. 248-256.
- Guimón, J., Chamínade, C., Maggi, C. and Salazar-Elena, J.C. (2018), "Policies to attract R&D-related FDI in small emerging countries: aligning incentives with local linkages and absorptive capacities in Chile", *Journal of International Management*, Vol. 24 No. 2, pp. 165-178.
- Haydaroglu, C. (2016), "The effect of foreign direct investment and economic freedom on economic growth: the case of BRICS countries", *Research in World Economy*, Vol. 7 No. 1, pp. 1-10.
- Herzer, D. (2012), "How does foreign direct investment really affect developing countries' growth?", *Review of International Economics*, Vol. 20 No. 2, pp. 396-414.
- Hong, L. (2014), "Does and how does FDI promote the economic growth? Evidence from dynamic panel data of prefecture city in China", *IERI Procedia*, Vol. 6, pp. 57-62.
- Huang, Y. (2019), "Environmental risks and opportunities for countries along the belt and road: location choice of China's investment", *Journal of Cleaner Production*, Vol. 211, pp. 14-26.
- Iamsiraroj, S. (2016), "The foreign direct investment-economic growth nexus", *International Review of Economics and Finance*, Vol. 42, pp. 116-133.
- Iamsiraroj, S. and Ulubaşoğlu, M.A. (2015), "Foreign direct investment and economic growth: a real relationship or wishful thinking?", *Economic Modelling*, Vol. 51, pp. 200-213.
- Kalai, M. and Zghidi, N. (2019), "Foreign direct investment, trade, and economic growth in MENA countries: empirical analysis using ARDL bounds testing approach", *Journal of the Knowledge Economy*, Vol. 10 No. 1, pp. 397-421.
- Kottaridi, C., Louloudi, K. and Karkalakos, S. (2019), "Human capital, skills and competencies: varying effects on inward FDI in the EU context", *International Business Review*, Vol. 28 No. 2, pp. 375-390.
- Kuo, L. and Kommenda, N. (2018), *What is China's Belt and Road Initiative?*, Vol. 30, The Guardian, London.
- Leitão, N.C. and Rasekhi, S. (2013), "The impact of foreign direct investment on economic growth: the Portuguese experience", *Theoretical and Applied Economics*, Vol. 1 No. 1, pp. 51-62.
- Li, X. and Liu, X. (2005), "Foreign direct investment and economic growth: an increasingly endogenous relationship", *World Development*, Vol. 33 No. 3, pp. 393-407.
- Liu, X., Burridge, P. and Sinclair, P.J. (2002), "Relationships between economic growth, foreign direct investment and trade: evidence from China", *Applied Economics*, Vol. 34 No. 11, pp. 1433-1440.
- Lyroutdi, K., Papanastasiou, J. and Vamvakidis, A. (2004), "Foreign direct investment and economic growth in transition economies", *South-Eastern Europe Journal of Economics*, Vol. 2 No. 1, pp. 97-110.

- Mahmoodi, M. and Mahmoodi, E. (2016), "Foreign direct investment, exports and economic growth: evidence from two panels of developing countries", *Economic research-Ekonomska istraživanja*, Vol. 29 No. 1, pp. 938-949.
- Makiela, K. and Ouattara, B. (2018), "Foreign direct investment and economic growth: exploring the transmission channels", *Economic Modelling*, Vol. 72, pp. 296-305.
- Makki, S.S. and Somwaru, A. (2004), "Impact of foreign direct investment and trade on economic growth: evidence from developing countries", *American Journal of Agricultural Economics*, Vol. 86 No. 3, pp. 795-801.
- Mencinger, J. (2003), "Does foreign direct investment always enhance economic growth?", *Kyklos*, Vol. 56 No. 4, pp. 491-508.
- Mihalache-O'Keef, A.S. (2018), "Whose greed, whose grievance, and whose opportunity? Effects of foreign direct investments (FDI) on internal conflict", *World Development*, Vol. 106, pp. 187-206.
- Mullen, J.K. and Williams, M. (2005), "Foreign direct investment and regional economic performance", *Kyklos*, Vol. 58 No. 2, pp. 265-282.
- Nasir, M.A., Huynh, T.L.D. and Tram, H.T.X. (2019), "Role of financial development, economic growth and foreign direct investment in driving climate change: a case of emerging ASEAN", *Journal of Environmental Management*, Vol. 242, pp. 131-141.
- Nistor, P. (2014), "FDI and economic growth, the case of Romania", *Procedia Economics and Finance*, Vol. 15, pp. 577-582.
- Otaviano Canuto, M.M.G. (2010), *The Day after Tomorrow: A Handbook on the Future of Economic Policy in the Developing World*, The World Bank, Washington.
- Öztürk, S., Sözdemir, A. and Ülger, Ö. (2014), "The effects of inflation targeting strategy on the growing performance of developed and developing countries: evaluation of pre and post stages of global financial crisis", *Procedia-Social and Behavioral Sciences*, Vol. 109, pp. 57-64.
- Pegkas, P. (2015), "The impact of FDI on economic growth in Eurozone countries", *The Journal of Economic Asymmetries*, Vol. 12 No. 2, pp. 124-132.
- Petri, P.A. (2012), "The determinants of bilateral FDI: is Asia different?", *Journal of Asian Economics*, Vol. 23 No. 3, pp. 201-209.
- Rahman, N. (2015), "Trends in FDI inflows and current account of India's BOP since 1991", *International Journal of Economics, Commerce and Research (IJECR)*, Vol. 5 No. 5, pp. 1-12.
- Shah, S.H., Hasnat, H., Cottrell, S. and Ahmad, M.H. (2019), "Sectoral FDI inflows and domestic investments in Pakistan", *Journal of Policy Modeling*, Vol. 42 No. 1, pp. 96-111.
- Shayanewako, V.B. (2018), "The relationship between trade openness and economic growth: the case of BRICS countries", *Journal of Global Economics*, Vol. 6, pp. 1-5.
- Silajdzic, S. and Mehic, E. (2015), "Knowledge spillovers, absorptive capacities and the impact of FDI on economic growth: empirical evidence from transition economies", *Procedia-Social and Behavioral Sciences*, Vol. 195, pp. 614-623.
- Simionescu, M. (2016), "The relation between economic growth and foreign direct investment during the economic crisis in the European Union", *Zbornik Radova Ekonomskog Fakulteta U. Rijeci: Casopis za Ekonomsku teoriju I Praksu*, Vol. 34 No. 1, pp. 187-213.
- Suleiman, S.H., Kassim, H.T. and Moh'd Hemed, I. (2017), "Unemployment and economic growth in Tanzania", *Journal of Economics, Management and Trade*, Vol. 10 No. 1, pp. 1-8.
- Tanggapan, D., Geetha, C., Mohidin, R. and Vincent, V. (2011), "The relationship between economic growth and foreign direct investment in Malaysia: analysis based on location advantage theory", *Management*, Vol. 1 No. 2, pp. 24-31.
- Tast, J. (2014), "The role of FDI in the economic development of transition countries", *Eurasian journal of Economics and Finance*, Vol. 2 No. 2, pp. 34-44.

-
- Thangavelu, S.M., Wei Yong, Y. and Chongvilaivan, A. (2009), "FDI, growth and the Asian financial crisis: the experience of selected Asian countries", *World Economy*, Vol. 32 No. 10, pp. 1461-1477.
- Tiwari, A.K. and Mutascu, M. (2011), "Economic growth and FDI in Asia: a panel-data approach", *Economic Analysis and Policy*, Vol. 41 No. 2, pp. 173-187.
- Trojette, I. (2016), "The effect of foreign direct investment on economic growth: the institutional threshold", *Région et Développement*, 43-2016, pp. 112-138.
- Uddin, M., Chowdhury, A., Zafar, S., Shafique, S. and Liu, J. (2019), "Institutional determinants of inward FDI: evidence from Pakistan", *International Business Review*, Vol. 28 No. 2, pp. 344-358.
- Wang, M. (2017), "Does foreign direct investment affect host-country firms' financial constraints?", *Journal of Corporate Finance*, Vol. 45, pp. 522-539.
- Watson, P. and Deller, S. (2017), "Economic diversity, unemployment and the great recession", *The Quarterly Review of Economics and Finance*, Vol. 64, pp. 1-11.
- World Bank (2017), *World Development Indicators*, available at: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators> (accessed July 2020).
- World Bank (2019), *World Development Indicators*, The World Bank, Washington.
- Yao, S. (2006), "On economic growth, FDI and exports in China", *Applied Economics*, Vol. 38 No. 3, pp. 339-351.
- Zahonogo, P. (2016), "Trade and economic growth in developing countries: evidence from sub-Saharan Africa", *Journal of African Trade*, Vol. 3 Nos 1-2, pp. 41-56.

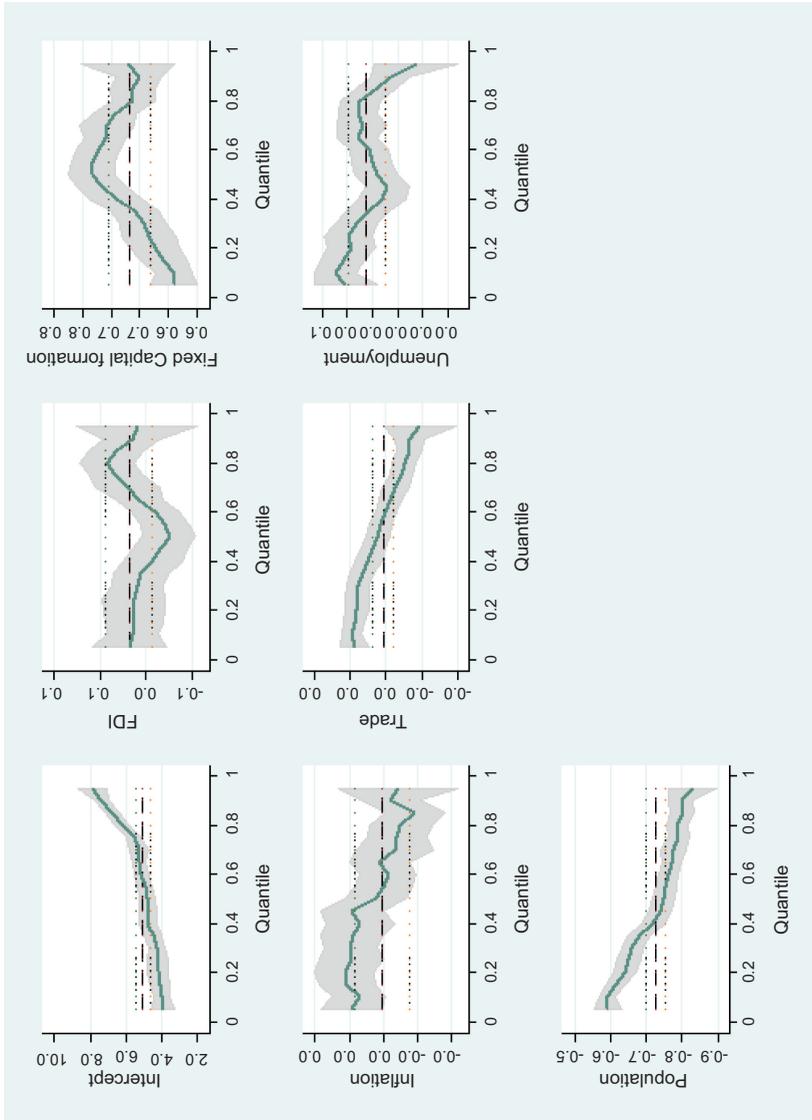


Figure A1.
Quantile regression
plot for full
specification

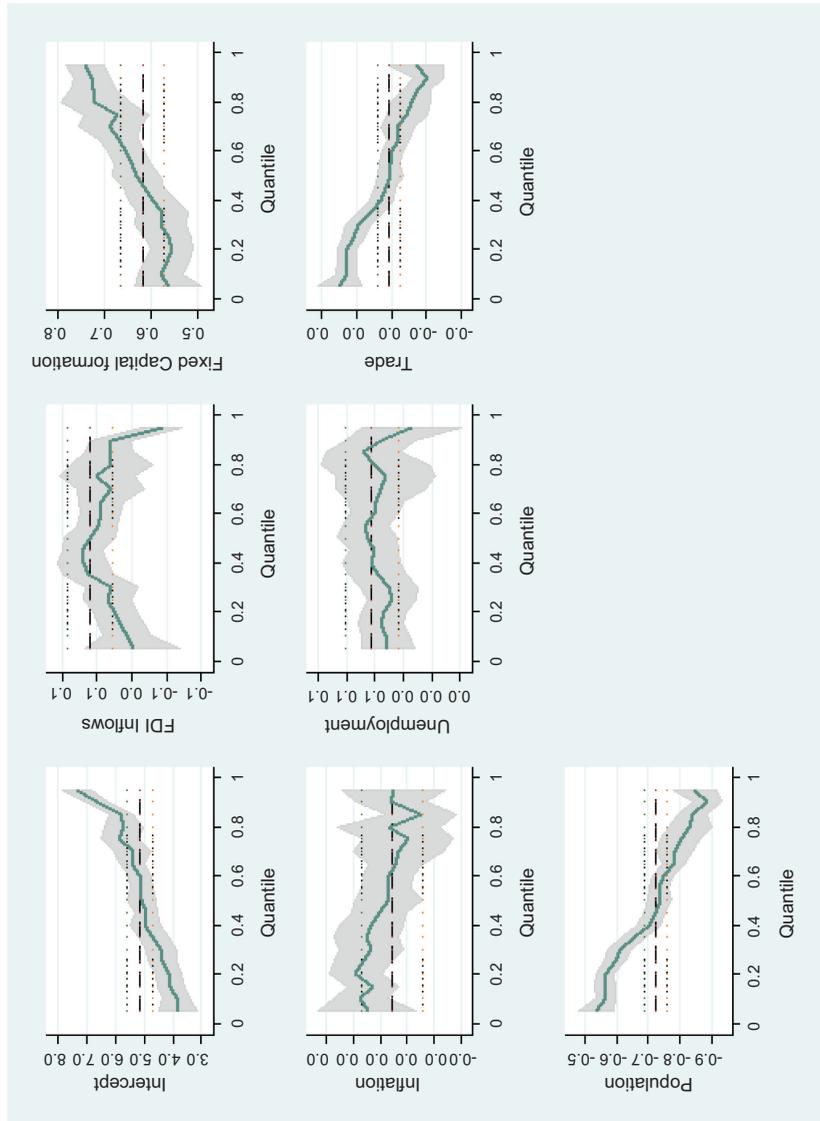


Figure A2.
Quantile regression
plot for Asian region

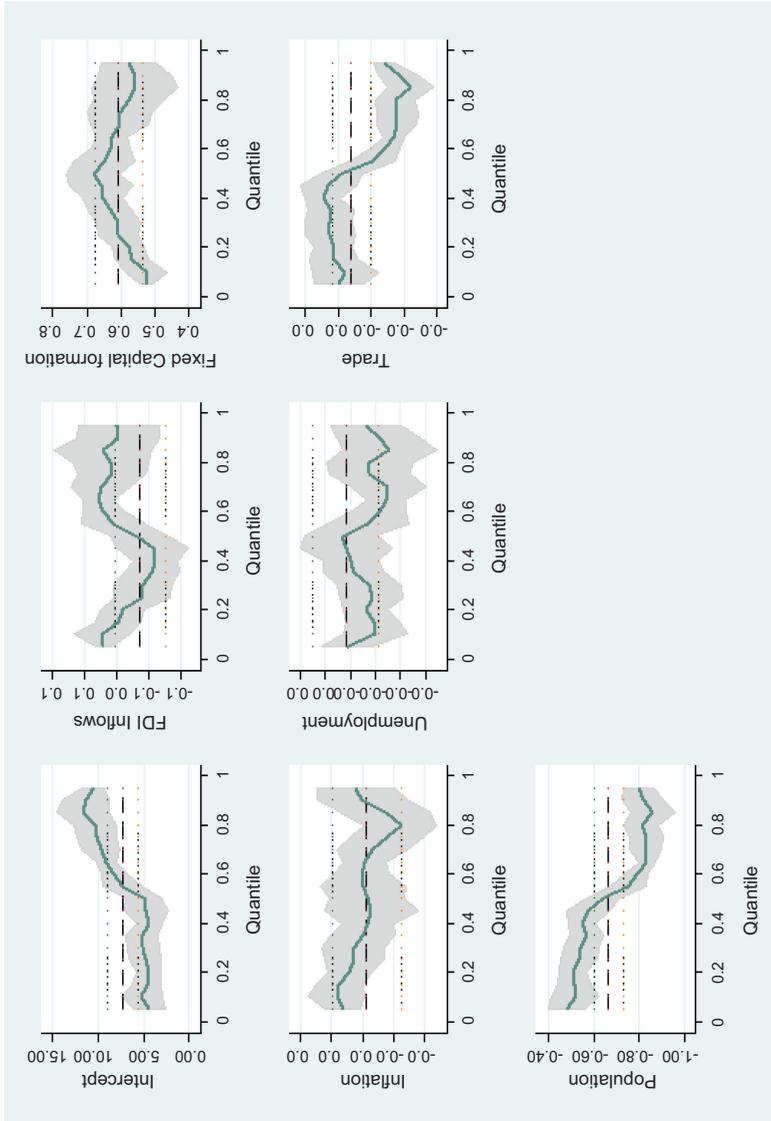


Figure A3.
Quantile regression
plot for Middle East
region

No	Asia	Middle East	High income	Low income
1	China	Bahrain	China	Indonesia
2	Cambodia	Iran	Brunei	Bangladesh
3	Bhutan	Israel	Singapore	Bhutan
4	Brunei	Egypt	Oman	Sri Lanka
5	Indonesia	Jordan	Israel	Philippine
6	India	Oman	Saudi Arabia	Cambodia
7	Malaysia	Saudi Arabia	Iran	Egypt
8	Mongolia	Yemen	Bahrain	Mongolia
9	Nepal		Thailand	Vietnam
10	Pakistan		Malaysia	India
11	Philippines		Jordan	Pakistan
12	Singapore			Nepal
13	Sri Lanka			Yemen
14	Thailand			
15	Vietnam			
16	Bangladesh			

Table A1. Source(s): World Bank Classification (<http://data.worldbank.org/about/country-classifications/country-and-lending-groups>)
Region and country list

Corresponding author

Umer Shahzad can be contacted at: shehzad-umer@hotmail.com, umer@aufe.edu.cn