

## Article

# Impact of FDI Inflows on Poverty Reduction in the ASEAN and SAARC Economies

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**Abstract:** The aim of this paper is to reinvestigate the impact of foreign direct investment (FDI) inflows on welfare or poverty reduction in the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) economies. We used FDI net inflows per capita and the United Nations Development Program's Human Development Index (HDI) as the principal variables ranging from 1990 to 2014. Our analyses confirm the positive and strongly significant relationship between FDI net inflows and poverty reduction in Asia. However, it indicates significant differences between South Asia and Southeast Asia. Generally, we find that FDI has a greater impact on welfare in SAARC countries than in ASEAN countries. Our results hold true for both HDI and real gross domestic product (GDP), and are shown to be robust using both panel and pool model specifications.

**Keywords:** ASEAN; Asia; FDI; poverty reduction; SAARC; welfare

## 1. Introduction

Being a comprehensive subject, sustainability is applicable to numerous sectors and genres. The social aspect of sustainability concentrates on the welfare of grassroots [1]. The origins of social sustainability are linked with significant mobilization of resources to developing nations. Recently, various nations of the world have started focusing on sustainable development (SD) [2]. The United Nations (UN) proposed 17 Sustainable Development Goals (SDGs) to deal with the challenges facing our planet. The very first SDG focuses on eradication and reduction of poverty; the achievement of this goal can provide the basis for sustainable development with the help of mobilization of resources from developed to developing economies. Likewise, the emphasis on effective policy measures to support enhanced investment in poverty eradication is among the desired steps towards sustainable development [3]. Similarly, corporate social responsibility (CSR) has been adopted as an approach to improve the living standard of the masses in underdeveloped countries. The private sector can stimulate economic development and introduce new job opportunities for grassroots unskilled labor in developing countries. At the same time, this practice can provide basic goods and services to one-third of the world population and help to generate profit for corporations. In this way, CSR can reduce poverty and promote sustainable development in developing countries [4].

The United Nations aims to reduce poverty and accelerate human development in developing countries. The SDGs of 2015 also focus on poverty reduction. A significant capital investment is

required to control this situation and foreign direct investment (FDI) is an important medium of capital inflows for developing countries [5]. FDI has been a popular source of funding for development in emerging countries. Since the early years of the 1990s, private sources of funding, led by FDIs, contributed over 75% of external capital flows towards developing nations. By 1998, its share increased to nearly two-thirds of the total capital inflows. A new phase of economic and capital growth started and developing countries achieved the highest level of capital inflows in 2007. This amount of inflows reached 690 billion US dollars in 2010. More recent statistics show that FDI inflows of developing economies reached 765 billion US dollars in 2016, and developing Asia remained the largest FDI recipient region in the world [6,7].

Despite these mounting figures of FDI inflows, the overall challenge of poverty lingered, mostly unaffected, in developing countries. At the inception of twenty-first century, in spite of decades of global economic growth, 1.2 billion people were still living in poverty worldwide. Although the proportion of poor people in developing regions decreased from 42% in 1990 to 25% in 2005, inequality increased as the share of national consumption of the poorest reduced from 4.6% in 1990 to 3.9% in 2004. Nonetheless, extreme poverty has declined significantly over the last two decades and this proportion dropped to 14% in 2015. Similarly, the number of people living in extreme poverty around the world declined by more than half, falling from 1.9 billion in 1990 to 836 million in 2015 (For more details, please refer to: (1). United Nations Millennium Development Goals Report 2009, page 6; (2). United Nations Millennium Development Goals Report 2007; and United Nations Millennium Development Goals Report 2008; (3). United Nations Millennium Development Goals Report 2015, page 4). At present, Asia is on track to reduce poverty numbers, but still a significant proportion of the population is facing extreme poverty. Among the sub-regions, Southeast Asia has made significant progress in alleviating poverty and achieving other dimensions of the Millennium Development Goals (MDGs).

The Southeast Asian economies reemerged after the shock of the Asian financial crisis of 1997 and the devastation of the Asian tsunami. The economic development trajectory, growth, and poverty reduction efforts of Southeast Asia are predicated by the economic growth driven by strong global trade, inward FDI, and the Association of Southeast Asian Nations (ASEAN) regional integration. The proportion of people in the region living below 1.25 US dollar per day decreased from 39% in 1999 to 19% in 2005. However, the share of the poorest quintile in national consumption changed slightly, falling from 6.2% in 1990 to 6.1% in 2004 (For more details, please refer to United Nations Millennium Development Goals Report 2009, page 6 and 7). The challenge of poverty remained substantial for most of the ASEAN countries except for Singapore and Brunei, as they produced double-digit economic growth and effectively eliminated absolute poverty. Burma, Cambodia, and Laos, in particular, are suffering from severe poverty problems [8].

The World Bank estimates show that the poverty rate varies widely across ten ASEAN countries with the greatest number of poor people accounting for almost 70% of the global poverty. At the same time, this rate varies from 6.5% to 81.7% in China and Madagascar, respectively. For several decades, three regions (i.e., East Asia and Pacific, South Asia, and Sub-Saharan Africa), accounted for almost 95% of the global poverty. Poverty levels remain excessively high and are mainly concentrated in Sub-Saharan Africa and South Asia. Yet with a slower pace of poverty reduction and rapid population growth, the share of global poverty increased to 43% in Sub-Saharan Africa, and this rate decreased only from 56.8% to 42.7% between 1990 and 2012. For the last three decades, South Asia has achieved more rapid poverty reduction, but it is still home to about one-third of the total poverty numbers around the world [9].

The role of South Asia, Southeast Asia, and the Pacific is critical for FDI inflows towards developing countries. Among other countries, China and India are the fastest growing economies of these regions and receive a significant portion of foreign capital flows to Asia. As Asia is the leading recipient of FDI and reducing poverty simultaneously, the FDI appears to be linked to better welfare or less poverty in this region. The assumption of a perfect positive correlation between economic growth

and welfare has been challenged. For example, economic growth without redistribution creates inequality and may actually negatively impact welfare [10]. Similarly, the measurement of economic development and human welfare is difficult, which limits the literature on this issue. Gross domestic product (GDP) per capita and poverty incidence are well known indicators in this area. The GDP per capita data are widely used because of data availability, but only one dimension of development is measured. The major problem in using poverty incidence is an incomplete data set and the difference in measurement methodologies across countries. The United Nations Development Program's (UNDP) Human Development Index (HDI) is now the universally accepted measure of human development and the data are also available for all economies. Nonetheless, among the few available studies about the impact of FDI on poverty reduction with HDI, the work of Gohou and Soumaré [5] focused on Africa, while Sharma and Gani [11] investigated this relationship for middle- and low-income countries. To the best of our knowledge, no study using HDI has been carried out for the South Asian Association for Regional Cooperation (SAARC) and ASEAN countries.

Keeping in view the UN's SDGs of poverty eradication and reduction, its significance in terms of social sustainability and mobilization of resources to developing countries, this paper studies the relationship between FDI net inflows and poverty reduction in Southeast Asia and South Asia, and especially focuses on the regional economic associations in these regions. We explore two research questions: (1) Does FDI reduce poverty in Southeast Asia and South Asia? (2) Does impact of FDI to reduce poverty differ in both regions? We consider two associations: the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC). Following Gohou and Soumaré [5], we used HDI to capture the welfare effects of FDI. As a check and to ensure robustness, we also selected an alternate welfare measure common to the literature (i.e., real GDP per capita). To measure FDI, we used net per capita inflows of FDI. The ratio of total FDI net inflows over GDP and the ratio of total FDI net inflows over gross capital formation (GCF) were our alternative measures of FDI.

The novelty of our work includes the following aspects: (1) To the best of our knowledge, this study is the first of its kind to analyze the extent to which FDI reduces poverty in Asia. (2) We analyzed Southeast Asia and South Asia as a whole and studied the impact individually for economic associations of both regions. (3) To capture accurate and robust results, we applied the panel and pool regression and used different model specifications to account for endogeneity problems.

The remainder of the paper is arranged as follows: A literature review is given in Section 2, data and econometric methods and our variables are discussed in Section 3, while Section 4 describes the econometric estimations of our analysis of the relationship between FDI and welfare in Asia and its economic cooperation unions in detail. Finally, the last section provides a conclusion and formulates policy recommendations.

## 2. Theoretical Considerations

The common assumption of studies which analyze the relationship between FDI and economic growth and its impact on economic development, is that economic growth improves welfare. The overall conclusion is mixed, but most research indicates that FDI enhances economic growth. The lack of a comprehensive, harmonized dataset and different econometric specifications could be the reason for differences in these findings. This section represents the theoretical link and empirical findings about FDI and welfare relationship in detail.

### 2.1. Theoretical Link between FDI and Poverty Reduction

The evolution of FDI in developing countries started since World War II, and was mostly motivated by political, rather than economic, motives and eventually shifted to the countries providing fiscal benefits, subsidies, and other economic incentives. Firstly, the link between FDI and welfare can be described through social and economic sides. On the social side, FDI can help the government in reducing poverty because it creates jobs, develops local skills, and stimulates technological progress.

On the economic side, the early viewpoint is that the technological progress is an ultimate driving force behind sustained economic growth and has an influential impact on societal progress [12]. However, recently the focus has been shifted to the human capital. The endogenous growth theory suggests that human capital and technology play indispensable roles in development and are the principal contributors to self-sustained growth in GDP per capita. Human development is the key factor behind human capital that stimulates our prime interest to assess how FDI impacts human development.

Secondly, this impact can be direct or indirect. The spillover effects of the private sector through backward linkages between FDI and indigenous suppliers, and domestic sourcing through forward linkages between FDI and native companies, enhances the export capacity of local firms. Similarly, the use of modern technology can increase competition and positive spillovers to accelerate economic growth and promote welfare. Another channel of direct impact is job opportunities, but this works only if the ratio of job opportunities is significantly greater than FDI related unemployment. Hence, FDI has a great impact on welfare in a pro poor labor-intensive sector (e.g., agriculture). These benefits are dependent on FDI type, but policy regime is also important to control or increase the foreign capital flows. At the macroeconomic level, FDI is likely to increase economic growth with an overall positive revenue transfer in country; in this case the relationship will be indirect depending on net transfer revenue ability to attract inflows. Additionally, the level of economic development in the host country also affects this relationship. For instance, this impact can be accelerated through efficient supplies, skilled labor, resource endowments, and social, political, and cultural characteristics of host countries (See Sumner [13] for a detailed discussion of various channels). In short, use of FDI to access the domestic market is more beneficial than purchasing raw materials for a firm outside the host country. The former's impact on promoting welfare is high because of the reduction in unemployment and acceleration of the domestic market.

## 2.2. FDI and Economic Growth

Numerous studies have investigated the direct and indirect relationship between FDI and economic growth with different econometric techniques. The findings are mixed. Estimating the growth effects of vertical and horizontal FDI into 44 host countries over the period 1983–2003, Beugelsdijk, Smeets, and Zwinkels [14] found positive and significant growth effects of FDI in developed countries, but no significant effects of horizontal or vertical FDI in developing countries. Using annual data from 1970 to 2002, Lee and Chang [15] applied the panel co-integration and panel error correction models to a set of 37 countries. The results suggested a fairly strong long-run relationship, but evidence of a short-run relationship was weak. Using cross-country observations for 91 countries from 1975 to 2005 with a threshold regression model, Azman-Saini, Law, and Ahmad [16] concluded that a certain degree of financial market development is necessary for the positive impact of FDI. The growth enhancing impact of FDI is not significant without improvements in domestic financial markets.

Likewise, Dutta and Roy [17], using a panel of 97 countries, empirically investigated the role of political risk in the association between FDI and financial development. The results indicated that the positive association between FDI and financial development became negative beyond a certain level and political risk factors altered the threshold level of financial development. This threshold level moves higher during a politically stable period, suggesting that the simultaneous existence of advanced financial markets and political stability is crucial for a significant impact of FDI on growth. As for regional analyses, Omri, Nguyen, and Rault [18] examined the causality links between CO<sub>2</sub> emissions, FDI, and economic growth using dynamic simultaneous equation panel data models for a global panel of 54 countries between 1990 and 2011. The data set was divided into sub-regional panels: Europe and Central Asia, Latin America, the Caribbean and Middle East, North Africa and sub-Saharan Africa. The results supported the evidence of bidirectional causality between FDI inflows and economic growth for all panels except Europe and North Africa. Using panel data for 49 countries over the period from 1974 to 2008, the results of Baltabaev [19] suggested that large FDI stock leads to

higher productivity growth and the ability to use modern technology increased FDI accumulation in developing countries.

Using a global sample of 140 countries for the period from 1970 to 2009, Iamsiraroj and Ulubaşoğlu [20] concluded that FDI positively affects economic growth and this association is significant in developing countries, as well as globally. In addition, regional variation matters and the role of openness and financial development is more crucial than schooling, in this link between FDI and growth. Using a dynamic spatial framework, Nwaogu and Ryan [21] investigated the link between FDI, aid, remittances, and economic growth for 53 African and 34 Latin American and Caribbean countries. The findings of separate estimations showed that foreign aid and FDI affected economic growth in Africa. The control analyses with three variables suggested that only FDI significantly influenced economic growth, and growth in one country depends on the growth of its neighboring countries.

Estimating the relationship and impact of FDI on growth in the Eurozone countries over the period from 2002 to 2012, using the Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) methods, Pegkas [22] revealed a positive long-run co-integrating relationship between FDI stock and economic growth. Furthermore, FDI positively affected economic growth in the Eurozone. Using a panel smooth regression model on a large sample of developing countries, Jude and Levieuge [23] examined a conditional relationship between institutional quality, FDI, and growth. Their results indicated that FDI had a positive effect on growth only beyond a certain threshold level of institutional quality, and the institutional reforms promoted economic development and worked as a stimulus. Investigating the role of market integration on bilateral FDI inflows for Organization for Economic Cooperation and Development (OECD) countries, Barrel and Nahhas [24] suggested that a single market, trade agreements, and distance affected the bilateral FDI among countries in a region. Similarly, Feils and Rahman [25] developed a hypothesis that regional integration increased in inward FDI. FDI inflows are greater in common economic area membership and the larger members attract more inflows. However, cultural and geographic distances, market size, and institutional efficiency have different impacts for outsider countries.

On the contrary, addressing the limitations of the existing literature, Herzer, Klasen, and Nowak-Lehmann [26] reviewed the FDI led growth hypothesis for 28 developing countries using co-integration techniques. The paper found no evidence for the long- and short-run impact of FDI on economic growth. In a more recent study on the effects of FDI on economic growth for 44 developing countries, using heterogeneous panel co-integration techniques, Herzer [27] argued that FDI has, on average, a negative effect on growth in developing countries. Using time series data from 1990 to 2010, the empirical findings of Basnet and Pradhan [28] indicated that the impact of FDI on economic growth is not significant for five SAARC countries. Similarly, Iwasaki and Tokunaga [29] conducted a meta-analysis of the literature that empirically examined the impact of FDI on economic growth in Central and Eastern Europe and the former Soviet Union. Their findings suggested that relevant studies fail to present concrete evidence on the relationship between FDI and economic growth. Hence, more research is necessary to identify the true effect.

### 2.3. Empirical Link between FDI and Poverty Reduction

Nonetheless, only few studies have used HDI to examine the impact of FDI on welfare. For example, Sharma and Gani [12] examined the effect of FDI on human development for middle- and low-income countries for the period 1975 to 1999. The fixed effect regression results specified a positive effect of FDI on human development for both groups of countries. In a more recent and comprehensive study, Gohou and Soumaré [5] explored this relationship for Africa. Their findings confirmed the positive and strongly significant relationship between FDI net inflows and poverty reduction in Africa, but found significant differences among African regions. Furthermore, FDI has a greater impact on welfare in poorer than in wealthier countries. Using the proportion of people living below the poverty line, Fowowe and Shuaibu [30] reexamined this link. The empirical findings showed a significant contribution of FDI inflows to reduce poverty in selected African countries.



Mirza and Giroud [31] argued that international corporations are a vital source for further investment into Vietnam. However, the involvement of foreign subsidiaries into a value-chain in Vietnam needs to be managed to gain a significant advantage over other ASEAN nations. Using the provincial data, Hung [32] confirmed a positive and significant, indirect impact of FDI on poverty reduction running from FDI to economic growth and poverty reduction in Vietnam. Exploring the FDI and poverty link, Shamim et al. [33] suggested that a poverty reduction impact of FDI in Pakistan in the long-run. Additionally, they proposed a positive association among political stability, financial development, and FDI. Based on a detailed literature survey, Tambunan [34] concluded that FDI has a positive impact on poverty reduction through exports-led growth in Indonesia. However, more efforts are required to enhance the tax collection and technological spillovers from multinationals. Analyzing the FDI, growth, and exports association, Ahmad et al. [35] found the bidirectional causal link between FDI and economic growth for ASEAN countries. Investigating the impact of FDI on poverty reduction in ASEAN, Uttama [36] found that FDI is conducive to poverty reduction and the effect of different variables varies in both individual and spatial aspects.

Some other studies also investigated the impact of economic growth on poverty. A good example is the work of Tsai and Huang [37] for Taiwan, which suggested that continual economic growth is the main driving force for poverty reduction in both the long- and short-run. Examining the impact of economic growth and institutional quality on poverty and income inequality in nine developing countries of Asia for the period 1985 to 2009, Perera and Lee [38] confirmed that growth leads to poverty reduction. To summarize, the FDI and economic growth literature found mixed results. Likewise, several studies are available on FDI and economic growth, but the literature on welfare effects of FDI is lacking. The perfect positive correlation between economic growth and welfare has been challenged with the view that growth of GDP does not necessarily reduce poverty. A small number of papers analyzed the direct relation between FDI and welfare to overcome this limitation.

### 3. Materials and Methods

To explore this relationship, our major variables are GDP per capita, HDI, and net inflows of FDI with a number of control variables. FDI net inflows are the sum of equity capital, reinvested earnings, and long- and short-term capital. We subdivided inflow into three variables: (i) FDIPOP: per capita FDI; (ii) FDI/GDP: the ratio of FDI net inflows over GDP; and (iii) FDI/GCF: the ratio of FDI net inflows over gross capital formation.

As far as welfare is concerned, GDP per capita and poverty incidence has been used in literature to assess the welfare progress in a country. The limitation of GDP per capita is it only captures the economic dimension of welfare. On the contrary, poverty incidence is a comprehensive measure of a country's wellbeing. Before, the international poverty incidence was calculated based on a poverty line of 1.25 US dollars per day and the World Bank updated this value to 1.90 US dollars per day in October 2015. The problem in using poverty incidence is the unavailability of data, as it is not recorded annually and, in fact, is too general to use.

To overcome these limitations, we used HDI as our main welfare variable. The UNDP defines HDI as a composite index that measures the average achievements of a country in three basic aspects of human development: health, knowledge, and standard of living. Life expectancy at birth represents health; knowledge is the combination of the adult literacy rate and the combined primary, secondary, and tertiary gross enrollment ratio, and GDP per capita based on Purchasing Power Parity (PPP) indicates standard of living in the HDI calculation (For details on how to calculate HDI, please refer to the technical note of the Human Development Reports available in United Nations Development Program website). Additionally, we also used GDP per capita to compare the results with literature and to check the robustness of our findings.

### 3.1. Variables

We considered three sets of control variables to improve our empirical findings; this covers economic and policy variables, institutional quality variables, and political risk variables. Economic and policy variables include: degree of openness (OP), measured as total imports plus exports over GDP, education (EDUCATION), measured as the gross primary enrollment ratio, government spending ratio (GOVSG), long-term debt ratio (DEBTGDP), and two infrastructure variables which are the number of fixed and mobile phones per 100 habitants (PHONE), and the number of internet users per 100 habitants (INTERNET). Institutional quality variables include: total credit by financial intermediaries to the private sector over GDP (CREDIT) and stock market capitalization over GDP (MKTCAP) to measure financial market development. Political risk variables include: political rights rating (PR) to measure freedom for political activism, and civil liberties rating (CL) to measure civil freedom.

Recently, economic integration with other countries is crucial to promote economic and infrastructural development within a specific country and region. Multilateral development institutions, such as the Asian Development Bank, International Monetary Fund, and the World Bank emphasize regional integration in their strategic plans and are taking actions in this direction. To investigate the regional differences among Asian countries, our sample includes two regions and their economic development communities: the ASEAN and SAARC. The countries included in our sample are: Indonesia, Thailand, the Philippines, Cambodia, Vietnam, Pakistan, India, Bangladesh, Nepal, Sri Lanka, and Bhutan. The data used in this study were taken from 1990 to 2014 inclusively. The study made use of annual data which were collected from various sources mentioned in Table 1. We used the log of real GDP in all models.

The HDI is a measure of health, education, and income. It measures the achievements of a country in these three dimensions to assess the level of development. The life expectancy at birth represents health, education is represented by the expected years of schooling for school-age children and average years of schooling in the adult population, and income is measured by gross national income (GNI) per capita. Following Gohou and Soumaré [5], we applied the regression analyses to capture the impact of FDI on welfare. The HDI and GDP per capita represent welfare. We used three FDI variables: per capita FDI, the ratio of FDI to GDP, and the ratio of FDI to GCF. The control variables were the economic and policy variables, institutional quality variables, and the political risk variables.

Among the economic and policy variables, government spending is expected to promote welfare. It is the major source of investment in economic and social infrastructure, including economic performance, health education, and the development of roads and markets to improve human development in a country. At the same time, a large portion of government financing comes from debt, which makes it an important control variable to account for the financial constraints of the government. The higher indebtedness of a country constrains the government's capacity to respond to the basic needs of its population. In addition, unproductive debts and capital flight are common characteristics of developing countries, which turn the impact of debt to negative. At the same time, the productive use of debt can improve the welfare of developing countries and work as an economic stimulus. The openness also indicates the positive attitude of the government to promote foreign investment and welfare.

Similarly, education shows the improvements and future prospects of the human capital in a country, hence, it is an important contributor to the public welfare. The infrastructure development and use of modern technology improves the living standard of the population. The use of technical gadgets is a sign of social and economic development to reduce poverty. We considered two measures of infrastructure: the number of internet users per 100 habitants and the number of fixed and mobile phone users per 100 habitants. Institutional quality is measured by financial intermediaries' credit to the private sector and stock market capitalization. The role of the private sector in developing economies is important in economic development, but the impact may vary in different regions. Finally, most of the Asian countries are political and socially not liberal, which negatively affects FDI.

**Table 1.** Description of variables and data sources.

Variables	Description	Data Source
HDI	Human Development Index	The Human Development Report of the United Nations Development Program
GDPPOP	Real per capita gross domestic product (GDP)	The World Bank's World Development Indicators (WDIs)
<b>Foreign direct investment</b>		
FDIPOP	Per capita foreign direct investment (FDI)	WDIs and the World Bank's Global Development Finance (GDF) database
FDIGDP	FDI/GDP	WDIs and GDF
FDIGCF	FDI/Gross Capital Formation (GCF)	WDIs and GDF
<b>Economy and policy</b>		
DEBTGDP	Long-term debt/GDP	WDIs
GOVSG	Government consumption/GDP	WDIs
OP	Imports + exports/GDP	WDIs
EDUCATION	Gross enrollment ratio for primary education	The UNESCO database
INTERNET	Internet users per 100 habitants	WDIs
PHONE	Fixed and mobile phones users per 100 inhabitants	WDIs
<b>Institutional quality</b>		
CREDIT	Credit by financial intermediaries to private sector/GDP	GDF and New World Bank database on financial development and structure
MKTCAP	Stock market capitalization/GDP	GDF and New World Bank database on financial development and structure
<b>Political risk</b>		
PR	Political rights rating	Freedom House
CL	Civil liberties rating	Freedom House

Note: This table has been adapted from Gohou and Soumaré [5].

### 3.2. Methodology Specifications

We checked data normality through descriptive statistics, correlation matrix, and the variance inflation factor (VIF). We applied the Granger causality test for welfare variables and conducted the unit root test to confirm the stationarity of variables. To investigate the relationship between FDI and welfare, we applied the panel regression model with real GDP per capita as a dependent variable. We applied the same panel regressions using the main welfare measure, HDI, from 1990 to 2014; our analyses include panel regression for Asia, ASEAN, and SAARC. To check the robustness of our results, we used cross-sectional regressions using pool estimations for each variable for each country, the pool least square, and the two stages least squares (2SLS) method for all models.

## 4. Results and Discussion

This paper aims to investigate the impact of FDI on welfare in Asia and explore the regional differences while focusing on South and Southeast Asia. Table 2 provides the descriptive statistics. We observe that mean and standard deviation indicate considerable normality in data.



**Table 2.** Descriptive statistics for Asian countries from 1990 to 2014.

Variables	St. Deviation	Mean	Min	Max
<b>Welfare</b>				
HDI	0.12	0.58	0.23	0.83
GDPPPOP	0.31	2.53	1.97	3.47
<b>Foreign direct investment</b>				
FDIPOP	36.2	24.7	−21.5	234.5
FDIGDP	0.02	0.01	−0.02	0.11
FDIGCF	0.11	0.08	−0.12	0.65
<b>Economic and policy</b>				
DEBTGDP	0.34	0.49	0.14	3.59
GOVSG	0.04	0.10	0.03	0.21
OP	0.35	0.70	0.15	1.69
EDUCATION	0.17	1.00	0.50	1.45
INTERNET	9.05	5.46	0.00	48.31
PHONE	42.41	31.17	0.03	155.54
<b>Institutional quality</b>				
CREDIT	0.30	0.35	0.01	1.65
MKTCAP	0.21	0.27	0.01	1.09
<b>Political risk</b>				
PR	1.76	4.21	2.00	7.00
CL	1.11	4.39	3.00	7.00

Note: The explanation of abbreviations used is given in Table 1.

Table 3 presents the correlation matrix for Asia. The results show that the correlation between two welfare variables is significant and supports the claim that economic growth enhances welfare. We observed that FDI related variables are also significantly correlated and strongly connected to welfare. Overall, the coefficients of correlation between explanatory variables suggest the absence of damaging multicollinearity. This increases our confidence that the results are not distorted by spurious correlations between variables. As a cross check of multicollinearity, this study uses the VIF. The VIF and tolerance are both widely used measures of the degree of multicollinearity in a regression model. It quantifies the impact of multicollinearity on the variance of regression. The basic purpose is to explain a variable in terms of different combinations of other variables. The simple formula of calculating the VIF value is  $= \frac{1}{1-R_j^2}$ . The more scattered data leads to a greater variance. On the other hand, a greater sample and more variability in a particular covariate reduces the chances of a high VIF value. In practice, there are different threshold levels to decide whether the variables are seriously correlated in a model. The test results indicate that the VIF values are well below the threshold level. Various rules of thumb are used to describe the threshold level, but the rule of 10 is widely accepted. All VIF values were less than 5. This confirms the reliability of regression estimates.

**Table 3.** Correlation matrix and variance inflation factor (VIF) for Asian countries (source: authors' analysis).

	HDI	FDIPOP	FDIGDP	FDIGCF	CL	CREDIT	DEBTGDP	EDUCATION	GOVSG	INTERNET	MKTCAP	OP	PHONE	PR	GDPPPOP
<b>HDI</b>	1														
<b>FDIPOP</b>	0.42	1													
<b>FDIGDP</b>	0.21	0.56	1												
<b>FDIGCF</b>	0.09	0.43	0.92	1											
<b>CL</b>	−0.30	−0.11	0.32	0.34	1										
<b>CREDIT</b>	0.52	0.67	0.21	0.07	−0.27	1									
<b>DEBTGDP</b>	0.03	−0.12	0.18	0.24	0.39	−0.14	1								
<b>EDUCATION</b>	0.33	0.12	0.25	0.21	−0.16	0.10	0.09	1							
<b>GOVSG</b>	0.06	0.14	−0.22	−0.28	−0.03	0.17	0.08	−0.26	1						
<b>INTERNET</b>	0.29	0.60	0.20	0.08	−0.15	0.47	−0.22	0.17	0.09	1					
<b>MKTCAP</b>	0.52	0.44	0.17	0.10	−0.35	0.50	−0.20	0.25	0.16	0.40	1				
<b>OP</b>	0.48	0.59	0.58	0.47	0.16	0.48	0.15	0.28	0.14	0.41	0.27	1			
<b>PHONE</b>	0.29	0.66	0.27	0.17	−0.20	0.43	−0.28	0.24	0.05	0.86	0.40	0.36	1		
<b>PR</b>	−0.14	0.09	0.41	0.39	0.82	−0.10	0.26	−0.04	−0.05	0.07	−0.23	0.36	0.03	1	
<b>GDPPPOP</b>	0.56	0.62	0.16	0.04	−0.16	0.72	−0.10	−0.11	0.38	0.36	0.52	0.50	0.33	−0.04	1
<b>Tolerance</b>		0.214	0.298	0.824	0.225	0.390	0.679	0.645	0.655	0.210	0.580	0.375	0.422	0.233	
<b>VIF</b>		4.66	3.35	1.21	4.45	2.56	1.47	1.55	1.52	4.75	1.72	2.66	2.37	4.29	

Note: The explanation of abbreviations used is given in Table 1.

To answer our research questions, we applied the Granger causality test for both welfare variables. We first conducted the unit root test to ensure the stationary properties of variables. We used the Levin, Lin, and Chu (LLC) approach [39], the Im, Pesaran, and Shin (IPS) method [40], and the augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests to test the existence of unit root in HDI, GDPPOP, and FDIPOP. The results presented in Table 4 show that HDI and GDP are stationary at level and FDI at first difference. In other words, all tests rejected the non-stationary hypothesis for our variables. The results of causality between FDI and GDP show the causal relationship between FDI and GDP for our sample; this leads to rejection of the null hypothesis that FDI does not cause GDP.

**Table 4.** Unit root and Granger causality test (source: authors' analysis).

	LLC	IPS	ADF	PP
<b>Stationary test</b>				
HDI	−3.36	−3.38	49.02	35.96
FDIPOP	−10.35 *	−12.38 *	172.36 *	317.10 *
GDPPOP	−3.43	−4.42	34.5	37.94
<b>Causality between per capita FDI and real per capita GDP</b>				
	Homogeneous non-causality	Homogeneous causality		
FDIPOP does not Granger Cause GDPPOP	5.19 *	5.16 *		
GDPPOP does not Granger Cause FDIPOP	0.66 ***	3.09 ***		
<b>Causality between per capita FDI and HDI</b>				
FDIPOP does not Granger Cause HDI	3.01 *	3.56 **		
HDI does not Granger Cause FDIPOP	2.80 **	3.54 **		

Notes: (1) The significance level for unit root is 5%; (2) \* shows stationary at 1st difference; (3) \* and \*\* indicate a causal relation at 5% and 10%, respectively; (4) \*\*\* shows that the values are not significant at given levels.

Continuing with the homogeneous causality test, we accepted the homogeneous structure of the causality and determined that FDI causes GDP. The results for HDI and FDI causal relationship support the bidirectional causality for both variables. The significance level for HDI causing FDI is higher than the opposite for both nonhomogenous and homogenous causal relationships. In summary, our results state a unidirectional causal link between FDI and GDP, and a bidirectional causal relationship at 5% and 10% level of significance between FDI and HDI, respectively.

We applied our empirical model to investigate the relationship between FDI and welfare. The panel regression results with real GDP per capita as the dependent variable are given in Table 5. Columns 1, 2, and 3 each use a different FDI variable as the explanatory variable without controls. The results indicate that FDI positively impacted GDP with a significance level of 5%. In column 4 of Table 5, we used all control variables and FDIPOP. The coefficient remained positive and significant. In column 5, we used FDIGDP to represent FDI and results remained the same. Column 6 uses FDIGCF and the results suggest a positive impact, but significance level was 1%. Our results also confirmed the significant impact of our control variables. For example, debt ratio has a negative impact on welfare. The reason is obvious that the government needs to spend funds for its debt servicing obligations, and the higher indebtedness of a country results in less financial resources for social spending. At the same time, this picture can turn opposite with economies of scale in different sectors of the economy.

**Table 5.** Panel regression results for the impact of foreign direct investment (FDI) on gross domestic product (GDP) for Asia (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	2.40 * (132.6)	2.49 * (100.3)	2.52 * (105.5)	2.47 * (24.4)	2.34 * (29.6)	2.33 * (29.2)	2.32 * (30.2)
FDIPOP	0.005 * (13.14)			0.0015 * (2.92)			0.007 * (4.05)
FDIGDP		2.25 * (2.77)			1.016 * (2.39)		
FDIGCF			0.14 *** (0.79)			0.036 *** (0.40)	
CL				−0.053 *** (−0.27)	−0.034 * (−2.82)	−0.034 * (−2.76)	−0.037 * (−3.11)
PR				−0.012 *** (−1.02)	−0.002 *** (−0.18)	−0.001 *** (−0.19)	−0.002 *** (−0.44)
CREDIT				0.42 * (8.07)	0.30 * (6.36)	0.31 * (6.51)	0.30 * (6.50)
DEBTGDP				−0.005 *** (−0.14)	−0.14 * (−6.68)	−0.15 * (−6.65)	−0.15 * (−6.85)
EDUCATION				0.44 * (6.09)	0.026 *** (0.45)	0.010 *** (0.18)	0.019 *** (0.34)
GOVSG				1.19 * (4.28)	0.29 *** (0.79)	0.31 *** (0.85)	0.15 *** (0.42)
INTERNET				0.001 *** (0.57)	0.004 * (2.76)	0.003 * (2.20)	0.003 * (2.44)
MKTCAP				0.33 * (5.39)	0.072 *** (1.64)	0.077 ** (1.74)	0.069 *** (1.61)
OP				0.21 * (4.78)	0.041 *** (1.10)	0.033 *** (0.88)	0.062 ** (1.66)
PHONE				0.004 *** (0.70)	0.007 * (2.31)	0.005 ** (1.75)	0.001 * (3.20)
Fixed Effects	No	No	No	No	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.78	0.72	0.76	0.81	0.88	0.89	0.92

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively; (2) values in parentheses are the t-statistics; (3) the two stages least squares (2SLS) are specified with a list of instrumental variables and fixed effects; (4) our estimations are robust for heteroskedasticity and autocorrelations because we use the Newey–West method throughout our analyses.

Government spending is the main source to improve welfare in developing countries, but the impact appears to be not very strong for the Asian region. It indicates the financial constraints of the government to spend sufficient funds on the well-being of people. Furthermore, human capital improvement positively affects welfare. Education increases the skills of the population and enhances the ability to produce and utilize available resources; this promotes economic and social awareness and reduces poverty. Both institutional variables include credit and market capitalization has a positive impact on welfare. It shows the improvement in financial markets and the active role of the private sector to develop a business environment in the Asian market. New infrastructure improves the standard of living and contributes to the overall sense of wellbeing.

Our infrastructure variables have a significant positive impact on GDP. Similarly, trade openness also promotes welfare; all coefficients are positive and significant at various levels. For political risk variables, we observed that civil liberty (CL) had a significantly negative impact on welfare. The CL and PR indicators assign high scores to countries with less political and civil freedom and low scores to countries with freer environments. The negative impact of both variables on welfare is consistent with our expectations that greater freedom contributes to welfare. We used the two stages least squares (2SLS) estimation on our model to control for a potential problem of endogeneity among our variables

as the error terms of the residuals of Z variables should not be correlated with the independent variable. The list of instruments at the first stage satisfy the order condition of identification. This specifies that the number of instruments are equal to the number of coefficients. In addition, the model is specified with the White coefficient covariance matrix and a constant to obtain heteroskedasticity robust standard errors for 2SLS estimations. Firstly, the OLS regression of the explanatory variables X on the instruments Z is used to obtain fitted values  $X^*$ . For this, the study specifies CREDIT, DEBT, EDU, GOVSP, INTERNET, MKTCAP, OP, PR, and CL as the instrumental variables and regresses with the main independent variable FDI at the first stage to get the fitted values. Secondly, after checking that the explanatory variables are free from the endogeneity problem, the model regresses all independent variables with the GDP growth and HDI to obtain the independent variable estimator 2SLS in the second stage. Additionally, any variable in X that is also in Z will achieve a perfect fit in the first stage and will be carried over without modification in the second stage. Hence, as independent variables are uncorrelated with the errors, it implies that selected instruments are orderly clean for the analysis purpose. The correlation matrix among the variables in X and the number of variables in Z is of highest probable rank. The results are presented in the last column of Table 5. The results suggest that the values, signs, and significance level of the coefficients are more or less the same. This confirms the significantly positive relationship between FDI and GDP in Asia.

We applied the same panel regressions using the main welfare measure, HDI, from 1990 to 2014. The results in Table 6 show that all FDI variables were positively associated with HDI. The significance level for FDIGCF was 1% and 5% for the other two variables without control variables. In column 4 to 6, the three FDI variables are presented with control variables; we dropped some variables with insignificant results for accuracy. The results indicate that FDI increased HDI at a 1% level of significance. Here, however, debit has a significant positive impact on HDI in the panel regressions, in contrast to the GDP where this impact was negative and not strongly significant for FDIPOP. All other variables were with the expected signs and mostly significant. For example, the direction of the relationship between HDI and education was positive, as it was in previous sample period, but the significance level was moved to 5%. Here, when we used the 2SLS estimation to deal with potential endogeneity, the results remained largely the same.

**Table 6.** Panel regression results for the impact of FDI on the Human Development Index (HDI) for Asia (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	0.54 * (64.3)	0.55 * (56.2)	0.57 * (59.5)	0.43 * (7.80)	0.44 * (7.84)	0.32 * (7.08)	0.26 * (4.58)
FDIPOP	0.002 * (7.69)			0.003 *** (1.32)			0.004 ** (1.80)
FDIGDP		1.15 * (3.56)			0.43 *** (1.31)		
FDIGCF			0.11 *** (1.64)			0.065 *** (1.27)	
CL				−0.035 * (−3.19)	−0.037 * (−3.37)	−0.025 * (−3.63)	−0.063 *** (−0.56)
PR				−0.010 *** (−1.66)	−0.011 *** (−1.62)	−0.066 ** (−1.74)	−0.014 * (−2.06)
CREDIT				0.11 * (4.14)	0.14 * (5.32)	0.039 *** (1.40)	0.12 * (4.74)
DEBTGDP				0.071 * (3.58)	0.069 * (3.45)	0.027 * (2.14)	0.056 * (3.04)
EDUCATION				0.12 * (3.33)	0.11 * (3.07)	0.26 * (8.01)	0.14 * (3.67)
GOVSG				0.035 *** (0.23)	0.10 *** (0.63)	0.025 *** (0.11)	0.050 *** (0.37)
INTERNET				0.005 *** (0.38)	0.004 *** (0.33)	0.008 *** (0.56)	0.002 ** (1.71)



Table 6. Cont.

	1	2	3	4	5	6	2SLS
MKTCAP				0.14 *	0.15 *	0.082 *	0.14 *
				(4.25)	(4.10)	(3.24)	(4.61)
OP						0.095 *	0.047 *
						(4.35)	(2.05)
PHONE				0.001 ***	0.008 ***	0.005 *	0.002 *
				(0.17)	(0.092)	2.69	(5.08)
Fixed Effects	No	No	No	No	No	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.71	0.74	0.79	0.74	0.78	0.84	0.83

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1%, levels respectively; (2) values in parentheses are the t-statistics; (3) 2SLS is specified with a list of instrumental variables; (4) estimations are robust for heteroskedasticity and autocorrelations.

Overall, our results for both panels with HDI and GDP regressions support the hypothesis of a significantly positive impact of FDI on welfare. In other words, FDI reduces poverty in Asian countries at the aggregate level both with bivariate and control regression analyses. Our findings clearly indicate that regional cooperation and host country economic, social, institutional, and political stability help to attract significant FDI inflows among the member countries. The large economies, like China and India, receive more inflows than other small economies. These inflows are positively correlated with economic development and significantly reduce the poverty level in Asia. Additionally, the impacts of domestic variables differ between regions. These findings are consistent with the views of Barrell and Nahhas [24], and Feils and Rahman [25], that single market trade agreements and demographic characteristics of the members of an organization help to increase FDI inflow among members more than outsider countries. Furthermore, the larger members attract more inflows in the European Union. The question that remains is whether this effect is uniform across the South and Southeast Asian regions.

To address our second research question, whether FDI reduces poverty more in some areas of Asia than in others, we ran panel regressions for the ASEAN and SAARC trading corporations of South and Southeast Asia. The sample period and dependent variables remained the same.

#### 4.1. Impact of FDI in Southeast Asia

We focused on the South and Southeast Asian regions to analyze the relationship between FDI and poverty. From Southeast Asia, we included the selected members of the ASEAN and the selection was made on the biases of data availability. The results of the HDI sample for ASEAN countries are reported in Table 7. The results confirm the positive impact of FDI on poverty reduction. Nonetheless, the impact is positive but this association is not strong for control analyses. The first three columns indicate that FDIGDP and FDIGCF are positively associated with HDI at a 1% level of significance, but this level is 5% for FDIPOP.

Furthermore, after the addition of control variables, this relationship remains positive but with less significance of only 1% for all FDI variables. All control variables have a positive impact, except debt, with same the intensity level for each model. The results of the 2SLS in the last column confirms the welfare impact of FDI for ASEAN countries. We excluded the control variables with inappropriate signs and low significance.

**Table 7.** Panel regression results for the impact of FDI on HDI for Association of Southeast Asian Nations ASEAN (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	0.62 * (49.2)	0.63 * (53.1)	0.64 * (57.3)	0.74 * (5.96)	0.55 * (7.44)	0.54 * (7.47)	0.55 * (7.69)
FDIPOP	0.005 * (2.87)			0.004 *** (0.73)			0.007 *** (0.15)
FDIGDP		0.41 *** (1.33)			0.087 *** (0.38)		
FDIGCF			0.022 *** (0.34)			0.064 *** (1.40)	
CL				−0.042 * (−3.65)	−0.010 *** (−1.04)	−0.009 *** (−0.99)	−0.084 *** (−0.86)
PR				−0.011 *** (−1.37)	−0.011 * (−2.10)	−0.007 * (−2.10)	−0.018 * (−2.08)
CREDIT					0.018 *** (0.69)	0.019 *** (0.71)	
DEBTGDP					−0.024 * (−1.96)	−0.026 * (−2.12)	
EDUCATION				0.054 *** (0.42)	0.26 *** (0.38)	0.034 *** (0.51)	0.022 *** (0.33)
GOVSG				0.79 * (2.06)	1.32 * (3.94)	1.38 * (3.94)	1.56 * (4.61)
INTERNET				0.001 *** (0.84)	0.005 * (2.60)	0.002 * (2.43)	0.006 * (2.80)
MKTCAP				0.12 * (2.57)	0.12 * (4.23)	0.10 * (4.32)	0.14 * (4.96)
OP					0.19 * (7.98)	0.21 * (6.36)	0.19 * (8.79)
PHONE				0.006 * (1.99)	0.001 *** (0.46)	0.003 *** (0.74)	0.004 *** (0.16)
Fixed Effects	No	Yes	Yes	No	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.73	0.71	0.80	0.88	0.84	0.85	0.87

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively; (2) values in parentheses are the t-statistics; (3) 2SLS is specified with a list of instrumental variables; (4) estimations are robust for heteroskedasticity and autocorrelations.

To assess the robustness of these findings, we applied the regressions in the ASEAN region using real per capita GDP as an alternative welfare variable for the full sample. The results are reported in Table 8. We observed that the estimations in the first three columns show a significantly positive impact on three FDI variables on welfare. Consistent with our previous findings, the significance level turns into 1% for each model with additional variables. The impact of debt remains negative, which indicates the less efficient use of debt by the government to generate beneficial impacts for society. Furthermore, it explains the general phenomena of excessive debts in developing countries, which increases the government's burden to pay off the interest associated with the debt, and reduces the capacity to spend for overall development. The 2SLS results also verify the significant positive relationship and the control variables produce a similar outcome for all variables. To summarize, FDI appears to have a positive impact on ASEAN countries with both dependent variables. To be specific, this positive relationship was significant only at the 1% level of significance, and the results were confirmed by the 2SLS for all models.

**Table 8.** Panel regression results for the impact of FDI on GDP for ASEAN (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	2.50 * (67.9)	2.64 * (102.2)	2.80 * (63.1)	2.16 * (12.1)	2.10 * (18.6)	2.17 * (12.9)	2.10 * (18.9)
FDIPOP	0.004 * (7.34)			0.006 *** (0.44)			0.007 ** (1.78)
FDIGDP		1.33 * (1.99)			0.17 *** (0.50)		
FDIGCF			0.82 * (3.69)			0.001 *** (0.016)	
CL				−0.031 ** (−1.92)	−0.042 * (−2.86)	−0.030 ** (−1.83)	−0.044 * (−3.06)
PR				−0.045 * (−3.98)	−0.030 * (−3.89)	−0.045 * (−4.02)	−0.028 * (−3.74)
CREDIT				0.50 * (11.7)	0.33 * (8.19)	0.51 * (11.8)	0.33 * (8.22)
DEBTGDP				−0.24 * (−9.35)	−0.23 * (−12.3)	−0.25 * (−9.48)	−0.23 * (−12.3)
EDUCATION				0.067 *** (0.47)	0.21 * (2.10)	0.059 *** (0.42)	0.23 * (2.34)
GOVSG				4.83 * (8.25)	1.14 * (2.15)	4.89 * (8.60)	0.88 *** (1.62)
INTERNET				0.003 *** (0.20)	0.005 *** (0.12)	0.007 *** (0.30)	0.002 *** (0.19)
MKTCAP				0.20 * (3.28)	0.022 *** (0.50)	0.20 * (3.25)	0.022 *** (0.50)
OP				0.18 * (4.63)	0.12 * (3.46)	0.17 * (4.21)	0.14 * (3.68)
PHONE				0.001 * (2.55)	6.11 *** (0.21)	0.009 * (2.58)	0.007 *** (0.45)
Fixed Effects	No	Yes	No	No	Yes	No	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.72	0.84	0.82	0.93	0.96	0.93	0.97

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1%, levels respectively; (2) values in parentheses are the t-statistics; (3) 2SLS is specified with a list of instrumental variables; (4) estimations are robust for heteroskedasticity and autocorrelations.

#### 4.2. Impact of FDI in South Asia

In South Asia, we investigated the FDI and welfare association for SAARC countries. Table 9 presents the results of the panel regressions for the SAARC nations with dependent variable HDI. The results show a strong positive impact of FDI on HDI. The relationship is significant at 5% in most cases. We used the control variables for three FDI variables in different models. In all models, the direction of FDI and HDI relationship remained positive. Among control variables, debt has a positive impact on welfare. Theoretically, the moderate levels of borrowing are likely to accelerate economic growth in developing countries, both through capital accumulation and productivity growth.

**Table 9.** Panel Regression results for the impact of FDI on HDI for South Asian Association for Regional Cooperation (SAARC) (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	0.49 * (48.2)	0.47 * (40.1)	0.48 * (39.4)	0.49 * (5.79)	0.50 * (5.92)	0.48 * (6.17)	0.15 * (2.35)
FDIPOP	0.002 * (5.51)			0.008 ** (1.84)			0.002 *** (0.66)
FDIGDP		5.57 * (6.08)			2.88 * (2.96)		
FDIGCF			1.43 * (5.54)			1.11 * (4.76)	

Table 9. Cont.

	1	2	3	4	5	6	2SLS
CL				−0.048 *	−0.050 *	−0.055 *	−0.028 *
				(−2.92)	(−3.09)	(−3.58)	(−2.73)
PR				−0.016 **	−0.010 **	−0.014 **	−0.023 *
				(−1.84)	(−1.85)	(−1.75)	(−4.26)
CREDIT				0.012 ***	0.055 ***	0.064 ***	0.12 **
				(0.11)	(0.49)	(0.61)	(1.72)
DEBTGDP				0.25 *	0.24 *	0.21 *	0.017 ***
				(3.52)	(3.41)	(3.15)	(0.35)
EDUCATION				0.012 ***	0.030 ***	0.044 ***	0.24 *
				(0.25)	(0.62)	(0.94)	(5.25)
GOVSG				0.64 *	0.57 *	0.18 **	0.73 *
				(2.49)	(2.27)	(1.94)	(2.64)
INTERNET				0.008 *	0.005 **	0.004 ***	0.006 *
				(2.08)	(1.76)	(1.45)	(2.58)
MKTCAP				0.18 *	0.14 *	0.11 *	0.022 ***
				(3.29)	(2.42)	(2.06)	(0.56)
OP				0.14 *	0.17 *	0.15 *	0.098 **
				(2.38)	(2.22)	(2.88)	(1.74)
PHONE				0.001 *	0.002 *	0.004 *	0.006 *
				(2.85)	(2.75)	(2.43)	(3.02)
Fixed Effects	No	No	No	No	No	No	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.71	0.79	0.87	0.83	0.79	0.88	0.83

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively; (2) values in parentheses are the t-statistics; (3) 2SLS is specified with a list of instrumental variables; (4) estimations are robust for heteroskedasticity and autocorrelations.

Developing countries, at early stages of development, offer higher returns than other countries to accumulate funds. The optimum use of borrowed funds with macroeconomic stability, policies that lead to economic incentives, and sizable positive shocks to various sectors of the economy enhances the positive impact of debt. South Asia is hosting India, one of the fastest growing economies, and the recently emerged economy of Bangladesh. The reasonable borrowings finance government spending and create productive capital assets. Thus, appropriate use of debt can bridge the saving and foreign exchange gap to facilitate overall welfare. The 2SLS results in the last column also confirm the positive association. The coefficient of FDIPOP is positive and significant at 1%. The control variables show the similar signs and impact.

We used the alternative welfare measure of GDP per capita for SAARC countries, as previously used for the ASEAN region to check the robustness of our results. The results of FDI and GDP relationship are presented in Table 10. The results show that in the first three columns, all FDI variables confirm the strongly significant and accelerating impact of FDI. The analyses with control variables from column 4 to 6 also indicate the significant coefficients of FDI. The infrastructure variables are more significant, and openness was also significantly linked with FDI. Here, the relationship between credit and FDI was also negative and not significant as it was for HDI in the second sample. Moving towards the 2SLS results, the FDIPOP coefficient was strongly significant, which certifies the positive relationship between the two variables. Additionally, the significance level did not change for 2SLS estimations. More or less, all variables showed the expected signs and acceptable significance, which assured the accuracy of our estimations.

**Table 10.** Panel regression results for the impact of FDI on GDP for SAARC (source: authors' analysis).

	1	2	3	4	5	6	2SLS
INTERCEPT	2.34 * (136.4)	2.33 * (110.2)	2.36 * (103.8)	2.75 * (25.1)	2.76 * (25.08)	2.77 * (24.3)	2.37 * (23.8)
FDIPOP	0.006 * (6.92)			0.003 * (3.93)			0.001 * (3.38)
FDIGDP		9.11 * (5.49)			4.70 * (3.62)		
FDIGCF			1.43 * (2.94)			0.65 * (1.93)	
CL				−0.015 *** (−0.72)	−0.024 *** (−1.12)	−0.028 *** (−1.29)	−0.016 *** (−1.09)
PR				−0.017 *** (−1.53)	−0.015 *** (−1.37)	−0.01 *** (−1.27)	−0.022 * (−2.77)
CREDIT				−0.21 *** (−1.51)	−0.26 ** (−1.81)	−0.21 *** (−1.44)	0.20 ** (1.82)
DEBTGDP				0.15 ** (1.65)	0.17 ** (1.79)	0.18 ** (1.91)	0.26 * (3.70)
EDUCATION				0.58 * (8.97)	0.58 * (8.89)	0.60 * (9.01)	0.076 *** (1.14)
GOVSG				0.11 *** (0.35)	0.021 *** (0.062)	0.037 *** (0.10)	0.23 *** (0.57)
INTERNET				0.001 *** (0.23)	0.003 *** (0.70)	0.002 *** (0.58)	0.004 *** (0.23)
MKTCAP				0.22 * (2.97)	0.18 * (2.30)	0.23 * (2.88)	0.16 * (2.69)
OP				0.47 * (6.14)	0.48 * (6.22)	0.53 * (6.67)	0.40 *** (1.29)
PHONE				0.001 *** (1.31)	0.001 *** (1.61)	0.002 *** (1.79)	0.009 *** (0.053)
Fixed Effects	No	No	No	No	No	No	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.74	0.89	0.85	0.79	0.78	0.76	0.87

Notes: (1) \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively; (2) values in parentheses are the t-statistics; (3) 2SLS is specified with a list of instrumental variables; (4) estimations are robust for heteroskedasticity and autocorrelations.

To sum it up, the HDI and GDP analyses indicate a strong positive impact of FDI to promote welfare in SAARC nations. This positive bond is stronger than in the ASEAN region for the panel and 2SLS estimations. Furthermore, the debt is associated with welfare at various significance levels. All other economic, infrastructural, and stability variables reveal similar findings. Hence, our results are robust and well-specified.

#### 4.3. Cross Check

To check robustness further, we ran cross-sectional regressions using the pool estimations for each variable for each country during the period of study. We applied the pool least square and 2SLS method for all models. We ran our estimations twice for each data division using our FDI variables, taking the HDI and GDP as dependent variables separately. We estimated regressions for Asia and across Asia. The results for Asia are presented in Table 11. In the first section, the GDP is the dependent variable. Column 1 shows that FDIPOP is significantly associated to economic development. In column 2, we include all FDI variables.



**Table 11.** Cross-sectional balanced pool estimations for Asia (source: authors' analysis).

	RGDP (All Countries)		HDI 1990–2014		HDI 2SLS	
	1	2	1	2	1	2
INTERCEPT	2.47 * (90.1)	2.44 * (89.2)	0.43 * (29.7)	0.48 * (34.7)	0.48 * (34.9)	0.45 * (8.10)
FDIPOP	0.005 * (10.7)	0.002 * (15.3)	0.003 * (5.06)	0.004 *** (0.15)	0.006 * (3.86)	0.008 *** (0.71)
FDIGDP		1.48 * (3.74)		1.44 * (7.14)		2.14 * (2.99)
GDIGCF		0.22 * (2.98)		0.42 * (11.7)		0.41 * (3.24)
CL	−0.008 *** (−1.06)	−0.018 * (−3.43)	−0.035 * (−12.8)	−0.030 * (−10.90)	−0.027 * (−10.2)	−0.037 * (−3.63)
PR	−0.012 * (−3.77)	−0.012 * (−3.66)	−0.010 * (−6.36)	−0.004 *** (−0.80)	−0.024 *** (−1.41)	−0.019 * (−1.97)
CREDIT	0.42 * (29.7)	0.37 * (25.6)	0.12 * (15.7)	0.067 * (9.03)		0.10 * (4.54)
DEBTGDP	−0.005 *** (−0.53)	0.011 *** (1.10)	0.071 * (14.8)	0.068 * (14.1)		0.080 * (2.90)
EDUCATION	0.44 * (22.4)	0.42 * (22.2)	0.12 * (12.70)	0.056 * (5.61)	0.081 * (8.01)	0.11 * (2.63)
GOVSG	1.19 * (15.7)	0.74 * (8.91)	0.035 *** (0.87)	0.24 * (5.68)	0.044 *** (1.11)	
INTERNET	0.001 * (2.14)	0.003 * (4.66)	0.005 *** (1.48)	0.002 * (6.79)	0.003 *** (1.06)	0.004 *** (1.24)
MKTCAP	0.33 * (19.8)	0.37 * (22.8)	0.14 * (16.2)	0.16 * (18.6)	0.15 * (18.1)	0.15 * (4.34)
OP	0.21 * (17.6)	0.26 * (20.8)		0.14 * (20.5)	0.15 * (23.8)	
PHONE	0.004 * (2.59)	0.002 ** (1.85)	0.006 *** (0.66)	0.002 * (3.61)	0.002 * (2.56)	0.003 *** (0.27)
Fixed Effects	No	No	No	No	No	No
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pool Obs.	3575	3575	3850	3850	3850	3850
R <sup>2</sup>	0.70	0.72	0.74	0.81	0.85	0.87

Note: \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively.

The results indicate that FDI variables are positive and significant. This proves that FDI increases economic growth and welfare in Asia at the aggregate level. Most of the control variables are significant at 5% and the direction of the relationship is largely uniform with the panel data results of GDP in Asia. In the second section, HDI is our dependent variable. In the first column, the results do not change for FDIPOP. In column 2, with the addition of another two FDI variables, the results reveal a positive link between FDI and welfare but at a 1% level of significance. We excluded some of non-significant control variables for well-specified estimations.

In Section 3, we ran pool estimations for our HDI sample using the 2SLS pool method. The results of both columns show that FDI is positively associated with poverty alleviation in the whole region at the aggregate level. All FDI variables are significant and positive, and the direction of control variables is as per our expectations. In short, our estimations supported the positive impact of FDI to reduce poverty in Asia. To further investigate this relationship across Asia, we considered our regional divisions and ran the pool estimations to confirm the robustness of the results. The results of the ASEAN region are reported in Table 12. In column 1 of the first section, we only used FDIPOP against our alternative welfare variable GDP.

**Table 12.** Cross-sectional balanced pool estimations for ASEAN (source: authors' analysis).

	RGDP ASEAN		HDI 1990–2014		HDI 2SLS	
	1	2	1	2	1	2
INTERCEPT	2.16 * (51.5)	2.15 * (50.9)	0.71 * (22.1)	0.76 * (26.6)	0.74 * (23.1)	0.76 * (6.45)
FDIPOP	0.007 ** (1.75)	0.006 * (2.33)	0.001 *** (1.60)	0.002 *** (0.72)	0.004 * (2.86)	0.006 *** (1.27)
FDIGDP		0.43 ** (1.77)		2.93 * (17.6)		2.94 * (4.04)
FDIGCF		0.046 *** (1.04)		0.65 * (21.9)		0.67 * (4.55)
CL	−0.031 * (−7.56)	−0.029 * (−6.75)	−0.036 * (−11.5)	−0.038 * (−14.1)	−0.042 * (−14.1)	−0.041 * (−3.87)
PR	−0.045 * (−15.6)	−0.044 * (−15.4)	−0.002 * (−4.95)	−0.008 * (−4.60)	−0.011 * (−5.33)	−0.009 *** (−1.36)
CREDIT	0.50 * (46.4)	0.50 * (43.4)				
DEBTGDP	−0.24 * (−36.6)	−0.24 * (−36.2)	−0.033 * (−6.21)			
EDUCATION	0.067 ** (1.86)	0.073 * (2.02)	0.038 *** (1.52)	0.068 * (2.98)	0.054 * (2.12)	0.074 *** (0.79)
GOVSG	4.83 * (32.3)	4.78 * (31.4)	1.05 * (9.88)	0.69 * (7.63)	0.79 * (7.98)	0.84 * (2.06)
INTERNET	0.006 *** (0.80)	0.004 *** (0.86)	0.001 * (3.53)	0.007 *** (1.05)	0.003 * (3.28)	0.007 *** (0.31)
MKTCAP	0.20 * (12.8)	0.20 * (12.7)	0.093 * (7.46)	0.12 * (11.7)	0.11 * (9.98)	0.12 * (2.91)
OP	0.18 * (18.1)	0.17 * (16.1)				
PHONE	0.003 * (10.3)	0.001 * (10.02)	0.004 * (8.31)	0.004 * (5.67)	0.005 * (7.72)	0.005 * (1.92)
Fixed Effects	No	No	No	No	No	No
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pool Obs.	1750	1750	1750	1750	1750	1750
R <sup>2</sup>	0.94	0.93	0.79	0.88	0.78	0.84

Note: \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively.

The estimated coefficients are positive and significant which explains that the positive link is consistent. The FDIPOP coefficient in column 2 does not change with the addition of other FDI variables. The significance level of additional FDI variables is moved to 1%, but the direction of the relationship is positive. The second and third section presents the results of the main welfare variable HDI. The first column of the second section reports the HDI and FDIPOP results. The significance level between both variables is at 1% with a positive sign that indicates the beneficial impact of FDI. With the addition of the remaining FDI variables, the coefficients of FDI in column 2 remain significant. The results were the same for our second pool method; the association was more significant for three FDI variables.

Moving to the control variables, we dropped few variables in different models to get consistent results. Generally, the direction and association level of control variables does not change and the pool estimations are similar with the panel results. The impact of debt was negative for the ASEAN region as it was in previous analyses, but the impact of credit was positive for both GDP models. In short, FDI is found to have a positive impact on both welfare variables, but the level of this association is not the same for all models. Furthermore, the results of pool estimations for the ASEAN region largely confirms the robustness of our panel findings. The results of SAARC countries are presented in Table 13. Starting from our alternative variable, the estimated coefficients in column 1 and 2 of the first section indicate a strong positive impact of FDI on poverty. Both models, with and without additional FDI variables, repeat the same outcome. Likewise, the first pool estimation for HDI is shown in center

of the table. The first column confirms the welfare promoting impact of our main FDI variable on HDI. The reported coefficient is significantly positive.

**Table 13.** Cross-sectional balanced pool estimations for SAARC (source: authors' analysis).

	RGDP SAARC		HDI 1990–2014		HDI 2SLS	
	1	2	1	2	1	2
INTERCEPT	2.76 * (105.8)	2.77 * (106.7)	0.49 * (22.5)	0.48 * (24.7)	0.49 * (4.81)	0.45 * (5.28)
FDIPOP	0.003 * (16.2)	0.001 ** (1.73)	0.008 * (5.15)	0.002 * (5.68)	0.009 *** (1.47)	0.001 ** (1.77)
FDIGDP		8.90 * (5.34)		7.32 * (9.88)		12.4 * (2.82)
FDIGCF		1.55 * (5.69)		3.31 * (16.4)		3.32 * (4.09)
CL	−0.011 * (−2.07)	−0.009 ** (−1.65)	−0.048 * (−11.3)	−0.060 * (−15.5)	−0.051 * (−2.74)	−0.061 * (−3.94)
PR	−0.016 * (−5.47)	−0.014 * (−4.45)	−0.0016 * (−7.19)	−0.011 * (−5.70)	−0.021 * (−2.30)	−0.012 ** (−1.74)
CREDIT			0.12 *** (0.42)	0.096 *** (0.35)	0.012 *** (0.10)	0.096 *** (0.079)
DEBTGDP			0.25 * (14.7)	0.18 * (10.7)	0.32 * (3.75)	0.19 * (3.02)
EDUCATION	0.61 * (37.4)	0.62 * (38.1)	0.012 *** (0.98)	0.038 * (3.27)	0.17 *** (0.19)	0.38 *** (0.78)
GOVSG	0.071 *** (0.81)	0.095 *** (1.08)	0.64 * (9.71)	0.42 * (7.02)	0.65 * (2.84)	0.42 * (2.06)
INTERNET	0.002 * (2.15)	0.002 * (2.70)	0.071 * (8.10)	0.050 * (6.15)	0.071 (2.36)	0.003 ** (1.87)
MKTCAP	0.12 * (7.52)	0.088 * (4.39)	0.18 * (12.8)	0.15 * (10.9)	0.19 * (3.34)	0.16 * (3.21)
OP	0.52 * (29.9)	0.49 * (26.5)	0.14 * (9.27)	0.23 * (15.7)	0.14 * (2.48)	0.24 * (4.49)
PHONE	0.004 * (2.26)	0.006 * (3.49)	0.001 * (11.1)	0.001 * (7.10)	0.002 * (3.47)	0.002 * (2.44)
Fixed Effects	No	No	No	No	No	No
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pool Obs.	2100	2100	2100	2100	2100	2100
R <sup>2</sup>	0.77	0.78	0.84	0.81	0.85	0.87

Note: \*, \*\*, and \*\*\* denote statistical significance at the 5%, 10%, and 1% levels, respectively.

The same is true for all the FDI variables in column 2. The last section of the table reports the 2SLS pool results for HDI. The findings do not differ from previous estimations. Both columns with one and three FDI variables, respectively, show the significant and positive contribution of FDI to reduce poverty from SAARC countries. Similarly, the control variables carry the same signs. Importantly, the impact of debt is still positive for the SAARC countries. Again, both approaches certify that obtained estimations are robust. In summary, we can conclude that the impact of FDI on welfare varies for both regions with substantial differences in terms of level of significance associated with this link. The overall impact is positive in Asia and across the regions.

## 5. Conclusions

This paper evaluates the impact of FDI on welfare across Asian regions using the HDI and the real per capita GDP as welfare measures. To measure FDI, we used per capita FDI net inflows, FDI net inflows over GDP, and FDI net inflows over gross capital formation. Following the literature, we controlled our estimations from the various factors that affect welfare and economic growth. The control variables included economic and policy variables, the business environment, and the quality of institutions and political risks variables. Our data set covered the 1990–2014 period. We found a strong positive impact of FDI on both welfare measures at the level of Asia as a whole. This

relationship holds true and significant after the addition of control variables. However, we conclude that the impact of FDI differs for the South and Southeast Asian regions. Our results suggest that the impact of FDI to alleviate poverty is more significant in SAARC countries. In other words, the impact of FDI to reduce poverty is more significant in less developed and poor countries of Asia. The findings are consistent for all models including both HDI and real GDP. Furthermore, the results of cross-sectional pool estimations confirm that the findings are robust.

Our findings have few policy implications for Asian and other developing countries. China and India are among the leading FDI destinations in Asia. To reduce the regional differences, the FDI policy of less developed countries should be focused on redirecting these inflows to small and poor economies. This redirection will boost the economy of low-income countries of the ASEAN and SAARC regions. Nonetheless, through new job opportunities, FDI promotes the welfare in the whole Asian region. The achievements in human capital attracts FDI in developing and less developing countries, which suggests that Asian and other developing countries should continue to invest more in improving the elements of human development. In fact, many Asian countries are agricultural economies; the policy incentives will attract FDI in agriculture and labor-intensive sectors and reduce inequalities within a country. Hence, national governments also need to develop their bargaining power with the help of effective policies to attract FDI in the desired sectors.

Asia is a versatile and volatile region with respect to religious, political, and social values. Indeed, the political, social, and economic context of the host countries influences the choice of investment. The South Asian countries should specially focus on internal security, political stability, and societal issues to maximize the poverty alleviation impact of FDI. Finally, further research can be carried out to investigate this relationship in Latin American and other developing regions. A detailed sectorial analysis, which we were unable to use due to several data limitations, using individual country disaggregated data will also enrich the current literature. Additionally, the impact of financial crises on FDI inflows on an individual and aggregate level will add to the current available literature for these economies. We leave these important questions for future research.

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