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An Empirical data investigation of the Greenfield Investment: Welfare nexus from low-income countries

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Foreign investment is considered as healthy investment that can potentially push a country's economy out of crisis and can lead towards prosperity in case of low income developing countries. Moreover, foreign investments such as the Greenfield investment is considered as the most appropriate in terms of bringing improvements in economic growth as well as health, education and overall welfare of a country. For that purpose, this study considers 14 low income countries with a time series data for the period starting from the year 1998 till 2017. Im Pesaran and Shin (IPS) test is used for unit root testing while a one-step system GMM is applied for full analysis. After carrying out the necessary analysis the results demonstrated that foreign investment as Greenfield has positive impact on the economic growth, education, health and welfare of low-income countries. Remittances also show a healthy and positive relationship, while aid as foreign assistance has negative associations with all dependent variables. From the policy point of view as low-income countries have a lack of capital; however sufficient natural resources therefore a flexible foreign investment policy is recommended. Through friendly foreign investment policies, countries can attract more investments which may potentially be used for the welfare of peoples.

Key words: *Greenfield investment, welfare, low-income countries, foreign investment*

Introduction

In the literature, there is a long debate on the factors of macroeconomics that effect economic growth, health, education and overall welfare of developing countries. Developing countries especially low-income countries mainly depend on foreign investment, remittances and aid (Raza et al., 2020). Developing countries have usually shown progress in economic growth and development, provided the international capital inflow. In low-income countries a positive impact of foreign direct investment on health is observed as well as the reverse effect from health toward Foreign Direct Investment FDI is also acknowledged (Burns et al., 2017). Greenfield Investment (GF) is a mode of FDI and studies show that host developing countries are beneficiaries by investment in GF mode (Stepanok, 2015).

FDI as a mode of GF contributes towards increasing capital formation and productivity in host countries (Kim, 2009), while other modes of investments ie. Merger and Acquisition (M&A) fail to do so. According to Calderon et al. (2004) GF not only boosts economic activities of host countries but also increases foreign owned physical capital. Through this mode of FDI, companies of the host countries get new technology and their labours become more familiar with modern technology by investment in human capital. Besides surges in economic activities, GF also creates employment opportunities in the host country (Bayer, 2017). By bringing employment opportunities, GF does not contribute to up-graded labour skills but rather an important driver of the host country economic growth (Blonigen and Slaughter, 2001).

A host country's culture and protection variables also play an important role, especially when the foreign investors are interested in investment in host country (Byun et al, 2012). Firms that invest in GF are more efficient than those that invest in M&A mode of FDI (Nocke and Yeaple, 2008), and for that reason most of the investors choose a GF mode of investment. Both in the literature and in practical examples it is observed that GF moves from rich countries to poor countries (Stepanok, 2015) as the investors invest more in developing countries than developed countries.

GF investment faces a lot of bureaucratic problems that triggers heavy costs including the process of acquiring real estate which consumes much of the time. As GF investment is a new startup investment, it contributes towards consistency in profits that further improves the economy of the host country (Marinescu, 2016). Furthermore, a GF investment allows an investor to build an entirely new company tailored to one's specific needs: however, it typically entails a slow process and a gradual market entry. GF investment, particularly those pursuing first-mover advantages, may be too slow to meet investors' objectives (Luu et al., 2019). GF investments are more likely to be used in industries that require a high level of technological expertise. However, the likelihood of a GF investment is hampered by high market penetration and high entry barriers. FDI as a GF mode of investment mainly depends on cultural, institutional, regional, trade policies, capital market conditions, currency risks,

host country's natural resources, skilled labor, economic and political situations (UNCTAD, 2005).

An investor choosing a GF mode of investment has certain advantages starting from new investment at initial stage, enjoy an environment of self-decision. Thus creating a friendly environment for their employees and accordingly creates more jobs, with the passage of time (Raza *et al.*, 2021). Such advantage also helps to avoid social problems with local government and a friendly relationship occurs that further gives good results in productivity (Harris, 1996).

This study is different from the existing studies due to its impact assessment of Greenfield investment on economic growth, health, education and overall welfare of low-income countries. Whereas the prior studies have ignored low income countries and instead investigated the relationship between Greenfield investment and economic growth of developing countries. Finally, I infer four hypotheses based on the provided theories, to find the relationship of Greenfield investment with economic growth, health, education and welfare of selected sample of low income countries.

The rest of the paper is divided into four sections: 1.) literature review, 2.) methodology and data sources, 3.) findings and discussion, and 4.) the study's conclusion.

Literature Review

Regarding FDI and its mode, the first study was conducted by Moon et al. (2003), and suggested a positive relationship between Brownfield-FDI (BF) and economic growth for the sampled countries. The author uses diamond modeling and supports the fact that the BF has stimulated economic growth in those countries. The findings of Calderon et al. (2004) indicated that both BF and GF have beneficial effects on economic development. The authors used a vector self-regression estimator for a sample data of 72 countries from 1978 to 2003. Neto et al. (2008) used Random Effect Model for 53 sampled countries from year 1996-2006 and through Granger causality tests it is observed that GF has one-way causation towards economic growth of developing countries, while M&A has a statistically adverse effect on the economic development of developed countries.

Slang and Hennart (2008) take a sample of 35 countries, and surveyed 248 foreign investment companies and justified their preference for investment in culturally distant countries through GF. Wang and Wong (2009) analysed that GF played active role in accelerating economic growth while M&A only increase capital levels. Furthermore, the authors used instrumental studies on 84 sampled countries from 1987 to 2001 and concluded that GF caused economic growth in both developing and developed economies. On Malaysian time series data from 1970 to2009, Almsafir et al. (2011) used a bound test

process. The authors looked at how GF boosted and accelerated Malaysia's economic development. Park et al. (2012) used a Sys-GMM estimator to study a sample of 40 developing countries from 1990 to 2009. GDP is more closely related to M&A per capita than GF, according to the results concluded by the authors. GF and BF inflows in 93 countries between 1990 and 2009 were assessed by the study of Zhuang and Griffith's (2013). The authors confirm that the impact of GF on income inequality was found to be strongly positive, while the impact of BF on income inequality was found to be insignificant.

Harms and Meon (2011) used GMM estimators to study 78 developing countries from 1978 to 2005. The findings of the study revealed that M&A and GF have a significant effect on economic growth; additionally, the impact of GF on economic growth is greater than that of M&A. Similar results were found in Harms and Meon (2013) for a subset of MENA countries. The authors confirmed that M&A does not result in the host country's capital expanding. Ashraf and Herzer (2014) used the GMM estimation methodology on a sample of 135 countries between 2003 and 2012. The author concluded that GF had a positive impact on trade in the entire sample of countries, while M&A had no impact. For the year's 1999 to 2010, Eren and Zhuang (2015) found a negative effect of GF and BF on economic growth in a sample of 12 European Union countries. Stepanok (2015) discovered that GF, and the companies that invest in GF, would reduce the host nation's productivity and welfare.

On the sampled data from 2003 to 2014, Luu (2016) used GMM estimators and believed that GF and M&A had helped to stimulate economic growth, and that developed countries would benefit more if human capital levels were raised. Marinescu (2016) based his research on the use of GF and M&A by transactional companies. In such a situation, transactional corporations preferred GF, according to the results, while supporting long-term growth. For the years 2003 to2011, Ashraf et al. (2016) compared a sample of 123 countries, covering both developed and developing countries. GF did not contribute to overall efficiency, according to the results and furthermore, neither GF nor M&A had a substantial effect on productivity in developing countries. Bayar (2017) looked at the effect of M&A and GF on economic growth in European Union countries from 2003 to 2015. According to research, both M&A and GF have positive effects on economic growth when measured using the Basher and Westerlund co-integration test. Amoroso and Castello (2018) looked at countries in the European Union to see if there was a connection between inward GF and labour polariswation. The authors found that GF aids in the improvement of low-skilled employment. Similarly, Amoroso and Muller (2018) looked into the European Union sampled countries and found that GF increases investment in the host nation.

From 2003 to 2015, Luu et al. (2019) used the GMM technique on a sample of 131 countries. In developing countries, corruption has a major positive impact on GF, while in developed countries; it has a significant negative impact. Bakar et al. (2019) used Robust Least Squares and random effect techniques to show that M&A and GF have harmed the environment in the

sampled ASEAN and SAARC countries from 2003 to 2014. Raza et al. (2020) used the ARDL technique to analyse time series data from 1990 to 2018 in Pakistan and found that GF is useful for increasing individual income and improving the health of a host country population. The authors also found that GF contributes to the well-being of a host nation. Similarly, Raza et al. (2020) used the GMM technique to demonstrate the situation of African developing countries from 1998 to 2017. GF increased the economic growth and development of African host developing countries, according to the study results. The authors also discovered that GF investment improves individual economies and health conditions.

Methodology and Data sources

GF investment is measured as a percentage of GNI, while remittances, official development assistance, and trade openness are measured per capita and in US dollars. Inflation is measured in percentages per year, while population refers to the total number of people living in a country. GNI per capita is used as a proxy for economic growth, while the life index, which is the life expectancy at birth, is used as a proxy for longevity. Similarly, the average year of schooling is used as a proxy for education, while the HDI, which is the geometric mean of health, education, and economic development, is used as a proxy for welfare. From 1998 to 2017, a sample of 14 low-income developing countries was chosen for this research. The timeperiod was chosen due to the data's availability. During this time span, there has been a massive inflow of GF investment into the LA&C developing countries, as well as a rapid globalisation process. The (WDI, 2020), (UNDP, 2020) and (UNCTAD, 2020) are the most common sources of data.

To achieve the study's goals, this study used a multivariate regression model, which was used in previous studies and can be written as:

$$Y_{\text{it}} = \alpha_0 + \alpha_1 \text{X}_{it} + \alpha_2 \text{Z}_{it} + \gamma_t + \eta_i + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Y_{it} is each country economic growth over time t and X_{it} is the goal variable and Z_{it} is the collection of regulated variables. γ_t is unobserved time span effect and η_i is unobserved country effect, while μ_{it} varies across countries and time.

The Harrod-Domar theory was used in this analysis since the authors were the first to incorporate capital into the economic growth model, which was later used in studies by Lehnert et al. (2013) and Bayar (2017).

Rearranging Eq. (1)

$$ET_{\text{it}} = \alpha_0 + \alpha_2 GF_{it} + \alpha_3 \text{RT} + \alpha_4 FA_{it} + \alpha_5 TR_{it} + \alpha_6 PT_{it} + \alpha_7 IF_{it} + \upsilon_{it} \quad \ldots\ldots\ldots (2)$$

Based on equation (2), the rest of the equations below were developed, which were also used in previous studies. The following is the final equation used in this study to analyse each dependent variable.

$$ET_{it} = \alpha_0 + \alpha_1 ET_{i(t-1)} + \sum_{j=0}^{p} \alpha_2 GF_{i(t-j)} + \sum_{j=0}^{q} \alpha_3 \mathrm{R}\,T_{i(t-j)} + \sum_{j=0}^{r} \alpha_4 FA_{i(t-j)} + \sum_{j=0}^{h} \alpha_5 TR_{i(t-j)} + \sum_{j=0}^{s} \alpha_6 PT_{i(t-j)} + \sum_{j=0}^{m} \alpha_7 IF_{i(t-j)} + \varepsilon_{it}$$

…… (3)

As a result, equation (3) is the final panel data model for economic growth, which is used in the studies of (lehnert et al, 2013) and (Bayar, 2017).

$$HT_{it} = \alpha_0 + \alpha_1 HT_{i(t-1)} + \sum_{j=0}^{p} \alpha_2 GF_{i(t-j)} + \sum_{j=0}^{q} \alpha_3 \mathrm{R}\,T_{i(t-j)} + \sum_{j=0}^{r} \alpha_4 FA_{i(t-j)} + \sum_{j=0}^{h} \alpha_5 TR_{i(t-j)} + \sum_{j=0}^{s} \alpha_6 PT_{i(t-j)} + \sum_{j=0}^{m} \alpha_7 IF_{i(t-j)} + \varepsilon_{it}$$

…….. (4)

The final panel data model for health is equation (4). The health life index model is based on a research by (Barro, 1991) and was used in a study by (Lehnert et al, 2013).

$$ED_{it} = \alpha_0 + \alpha_1 ED_{i(t-1)} + \sum_{j=0}^{p} \alpha_2 GF_{i(t-j)} + \sum_{j=0}^{q} \alpha_3 \mathrm{R}\,T_{i(t-j)} + \sum_{j=0}^{r} \alpha_4 FA_{i(t-j)} + \sum_{j=0}^{u} \alpha_5 TR_{i(t-j)} + \sum_{j=0}^{e} \alpha_6 PT_{i(t-j)} + \sum_{j=0}^{s} \alpha_7 IF_{i(t-j)} + \varepsilon_{it}$$

…… (5)

The final panel data model for education is equation (5). The educational index model is used in the (Lehnert et al, 2013) analysis.

$$WF_{it} = \alpha_0 + \alpha_1 WF_{i(t-1)} + \sum_{j=0}^{p} \alpha_2 GF_{i(t-j)} + \sum_{j=0}^{q} \alpha_3 \mathrm{R}\,T_{i(t-j)} + \sum_{j=0}^{r} \alpha_4 FA_{i(t-j)} + \sum_{j=0}^{r} \alpha_5 TR_{i(t-j)} + \sum_{j=0}^{h} \alpha_6 PT_{i(t-j)} + \sum_{j=0}^{c} \alpha_7 IF_{i(t-j)} + \varepsilon_{it}$$

……. (6)

The final panel data model for welfare is equation (6). The HDI model is based on Human Development Theory (UNDP, 1990), which has been used in studies by (Sharma & Gani, 2004) and (Lehnert et al, 2013).

Results and Discussion

Based on the provided analysis this paper concludes certain results that is discussed in this section of the paper. This paper found that low-income developing countries have potential of attracting foreign investment, because these countries are in abundance of natural resources that can be used to compel investors for production activities. As maintained this paper considers low income countries as sample for the analysis. Stepwise results of this study are provided as given:

Table 1:- Descriptive Statistics

Variable	OBS	MEAN	S.D	MIN	MAX	SK	KR
GF_{it}	280	2.0315	0.7613	-0.9801	3.8141	5.6128	40.2915
RT_{it}	280	8.2318	0.7899	5.9425	9.9136	-0.4129	3.2008
FA_{it}	280	27.6105	64.2431	-38.0302	576.2161	5.8395	42.7925
TR_{it}	280	-0.2427	0.1502	-0.6061	0.2181	0.5016	3.3027
PT_{it}	280	7.1204	0.2314	6.7814	7.7146	0.0139	2.3116
IF_{it}	280	7.0531	7.9812	-35.9124	44.9139	1.1642	9.5921
ED_{it}	280	-0.4718	0.1801	-0.9531	-0.2615	-0.8191	3.1381
HT_{it}	280	-0.2519	0.1052	-0.6013	-0.1127	-0.8125	3.9041
ET_{it}	280	-0.4326	0.1263	-0.6172	-0.3291	-0.5192	2.8725
WF_{it}	280	-0.3815	0.1951	-0.7136	-0.2519	-0.4194	2.9164

Table 1 explains the behaviors of all considered variables using descriptive statistics for low income countries. Descriptive statistics comprises of mean, standard deviation, maximum and minimum value. Each variable taken in this study has also skewness and kurtosis shown in the table. Each panel dimension contains 280 observations in this case.

Table 2:- Correlation Matrix

Variables	GF_{it}	RT_{it}	FA_{it}	TR_{it}	PT_{it}	IF_{it}	ED_{it}	HT_{it}	ET_{it}	WF_{it}
GF_{it}	1									
RT_{it}	0.215	1								
FA_{it}	0.423	0.021	1							
TR_{it}	0.276	0.252	0.299	1						
PT_{it}	0.392	0.316	0.407	-0.225	1					
IF_{it}	-0.201	-0.195	-0.124	0.306	-0.162	1				
ED_{it}	0.311	0.402	0.122	0.512	0.126	0.298	1			
HT_{it}	0.292	0.711	0.121	0.411	0.331	-0.023	0.327	1		
ET_{it}	0.109	0.598	-0.191	0.204	0.013	-0.105	0.391	0.599	1	
WF_{it}	0.309	0.575	-0.021	0.442	0.092	0.197	0.89	0.793	0.699	1

The results of the correlation matrix for all variables are shown in Table 2. It has been discovered that GF only has a negative correlation with inflation, while all other variables have a mild or moderately strong positive correlation. Similarly, with the exception of inflation, which has a negative weak correlation, remittance has a weak or moderately strong positive correlation with all other variables. Foreign assistance also has a weak negative correlation with health inflation and economic growth, whereas all other variables have a positive correlation. Only a weak negative correlation exists between trade and population, and a weak positive correlation exists between trade and other variables. Population and inflation, on the other hand, have only a weak and negative correlation, while other factors have both positive and weak correlations. Inflation has a weak positive correlation with education and health, but a weak negative correlation with economic growth and health. Furthermore, there is a positive relationship between education, welfare, economic growth and health.

Table 3:- Unit Root Tests of All Variables

Variables	At Level		First Difference	
	Constant	Constant+Trend	Constant	Constant+Trend
GF_{it}	-1.72** (0.043)	-4.21** (0.000)	----------	----------
RT_{it}	-0.2041 (0.426)	-1.3274 (0.094)	-7.1824** (0.000)	-8.1401** (0.000)
FA_{it}	5.2453 (0.999)	-0.4218 (0.345)	-4.0073** (0.008)	-2.6394** (0.010)
TR_{it}	-6.1294** (0.000)	-6.6409** (0.000)	----------	----------
PT_{it}	-1.9872** (0.024)	0.9503 (0.951)	-5.2624** (0.000)	-6.7606** (0.000)
IF_{it}	1.2525 (0.893)	-0.8902 (0.188)	-8.1171** (0.000)	-8.6529** (0.000)
ED_{it}	-0.0171 (0.494)	2.6429 (0.999)	-5.4006** (0.000)	-7.2106** (0.000)
HT_{it}	-4.0585** (0.000)	4.7237** (0.000)	2.0314** (0.000)	-2.2304** (0.012)
ET_{it}	1.241 (0.892)	-0.8874 (0.187)	-8.1091** (0.000)	-8.6435** (0.000)
WF_{it}	-0.0168 (0.493)	2.6334 (0.995)	-5.3982** (0.000)	-7.2091** (0.000)

Brackets ( ) denote P-value, ****** denote 5% significance level.

Table 3 displays the effects of the panel unit root test for all variables in the presence of both cases of deterministic term for low-income countries. Only GF and inflation are identified as stationary in both cases in deterministic term, while foreign assistance, trade, and health are identified as stationary in one of the two cases at a nominal size of 5. Population, health education, economic growth and remittances, on the other hand, are unit roots when trend is included. However, these unit root variables at the stage now tend to be stationary in both cases, despite their initial variations.

Table 4:- Results of All Dependent Variables

Variables	ET_{it}	HT_{it}	ED_{it}	WF_{it}
Constant	-0.3083 (0.233)	-0.0428** (0.786)	0.0700 (0.569)	-0.1235 (0.226)
Lag of each dependent variable	0.7246** (0.008)	0.8649** (0.000)	0.9040** (0.000)	0.7936** (0.000)
GF_{it}	0.0950** (0.039)	0.0292** (0.001)	0.0657** (0.037)	0.1069** (0.001)
RT_{it}	0.0406** (0.023)	0.0103** (0.032)	0.0184** (0.048)	0.0143** (0.041)
FA_{it}	-0.0414 (0.511)	-0.0099 (0.469)	-0.0093 (0.661)	-0.0015** (0.035)
TR_{it}	0.0566** (0.047)	-0.0226 (0.378)	0.0691** (0.041)	0.1227** (0.019)
PT_{it}	0.1763** (0.047)	-0.0088** (0.035)	0.0386 (0.182)	-0.0262** (0.045)
IF_{it}	-0.0003 (0.792)	-0.0004** (0.043)	-0.0018** (0.046)	-0.0004 (0.413)
Countries	14	14	14	14
Observations	259	259	259	259
AR (2) P-value	0.339	0.761	0.739	0.822
Sargen/Hansen P-value	0.738	0.429	0.561	0.752

Brackets ( ) denote P-value, ****** denote 5% significance level.

The constant term is statistically insignificant and negative, while the welfare lag is statistically significant and positive, as shown in Table 4. Greenfield investment aids low-income economies' economic growth and this study considers GF to be statistically important and optimistic. This study's results are consistent with Harms and Meon's (2011) findings. According to the authors, GF is relatively more accepted in low-income countries than in high income countries. Remittances are the second largest source of funding for economic growth, and this study finds that they are beneficial to the economic conditions of low-income developing countries. Foreign assistance appears to be inefficient, statistically irrelevant, and negatively correlated with economic growth. Driffield and Jones (2013) also find these results. According to the source, GF and remittances play a positive role in developing countries' economic growth, while foreign assistance has a negative impact. Low-income countries will benefit from trade if government policies promote investment. In this study, trade was found to be positive and meaningful, while inflation was found to be statistically insignificant and negative. These findings are consistent with the findings of Jongwanich and Kohpaiboon (2019). Population plays a statistically significant positive role in promoting per capita income in this analysis.

In the second column, where provided health analysis, this paper found that GFDI is statistically important and positive, which aims to improve people's living conditions. Nagel et al. (2015) and Burns et al. (2017) all reached the same conclusion. The authors believed that GF helps people in low-income developing countries improve their lives. Remittances also improve the quality of life for the families who receive them, reducing poverty in the area even further. Naanwaab and Yeboah's (2013) research confirms this finding and also indicates that families who earn remittances spend more on their well-being. Foreign assistance and trade have a negative effect that is statistically negligible, while population and inflation have a major and negative impact. Low-income countries with low wages face problems such as a large population and limited trade with developed countries, resulting in low exports.

In the third column of education analysis, this paper investigates that Greenfield investment usually contributes to the promotion of education and the study's third hypothesis is accepted. In this study, GF is found to be statistically significant and positive. The findings of this study have been verified by Kheng et al. (2016) and Miningou and Tapsoba (2017). Remittances also improve the education of children in remittance-receiving households, as shown by the fact that remittance is positive in this report. The impact of foreign assistance on education is negative and statistically insignificant, as shown by Asiedu and Nandwa's (2007) study. The study shows that foreign investment as Greenfield and remittances have a statistically important and positive impact on the welfare of low-income countries in the last column of welfare research. The results of this study are in line with those of Sapkota (2011) and Shah (2016). The analysis of Kumler (2007) and Raza et al. (2021) confirms that aid as foreign assistance has a statistically insignificant and negative association with welfare. While trade and the population both help to improve education, the latter is statistically insignificant. Inflation has a statistically significant but negative and adverse relationship with the education sector in developed countries with low levels of education.

Table 5:- Multicollinearity Test

Variable	VIF	1/VIF
GF_{it}	3.23	0.3095
RT_{it}	1.16	0.8621
FA_{it}	2.08	0.4808
TR_{it}	1.35	0.7407
PT_{it}	2.12	0.4717
IF_{it}	1.83	0.5464

The Variance Inflation Factor (VIF) is panel data multicollinearity metric (Gomez et al., 2016). The VIF allows for correlation checking, and the VIF mean is less than ten (Neter et al., 1985). Since each variable's VIF value is less than10, there is no multicollinearity among independent variables, indicating that all variables are stable.

Conclusion

This study takes a sample of 14 low-income countries from different regions for the time period of 1998-2017. IPS and GMM techniques are applied for unit root testing and full analysis of the results and to check multicollineraity among variables, VIF is applied. The results revealed that Greenfield investment is a blessing for economic activities, health, education and overall welfare of low-income countries. Greenfield investments not only boost economic growth but also helps to improve economic development especially health and education infrastructure of the host countries. Remittances also improve the individual income of the receiving families that further standardized their health and educational activities. On the other side, foreign aid has negative and significant effect on economic growth and economic development of low-income countries. This means that foreign aid receiving countries has gained nothing but has damaged their economic growth, health and education sectors and overall economic development.

From the results of this study, it is clear to the policy makers that a liberal and friendly environment for foreign investors is to be established that will encourage them to make more investment in host country. Attractive policies initiative simplifies the way for investors to take advantage from such facility that will have positive impact on economic development of the host country.

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