



# Analysing the Impact of Foreign Direct Investment Spillovers on the Indian Economy

<sup>1</sup>Manoj M J, <sup>2</sup>Sanjay Chatriya, <sup>3</sup>Arvind S E, <sup>4</sup>Socrates Shahrour

<sup>1,2,3</sup>MA Student, Department of Economics, Jain (Deemed-to-be University), Bengaluru, India

<sup>4</sup>Research Scholar, Department of Economics, Jain (Deemed-to-be University), Bengaluru, India

Email – [22marec010@jainuniversity.ac.in](mailto:22marec010@jainuniversity.ac.in), [22marec005@jainuniversity.ac.in](mailto:22marec005@jainuniversity.ac.in), [22marec003@jainuniversity.ac.in](mailto:22marec003@jainuniversity.ac.in),  
[s.socrates@jainuniversity.ac.in](mailto:s.socrates@jainuniversity.ac.in)

**Abstract:** *This research examines the spillover effects of Foreign Direct Investment (FDI) on Total Factor Productivity (TFP) in the Indian economy. Through a comprehensive regression model, the study examines the spillover effects of FDI inflow on TFP and provides a deep insight into the determinants of TFP such as Gross capital formation, Rail lines, Investment in energy and transport, GDP growth rate and Inflation. The study identifies a positive and statistically significant association between FDI inflows and TFP, underscoring the pivotal role of foreign investment in enhancing productivity. Additionally, targeted investments in rail infrastructure and a higher GDP growth rate favourably correspond with TFP. Conversely, the nuanced impact of Gross Capital Formation and Investment in energy and transport did not emerge as a statistically significant predictor of TFP. The study also explores the relationship between inflation and TFP, indicating a potential negative association that necessitates careful consideration. The high R-squared value suggests that the model effectively captures a substantial proportion of the variance in TFP providing the goodness of fit of the model.*

**Key Words:** *Foreign Direct Investment, Total Factor Productivity, Economic Spillover Effects, Determinants of Total Factor Productivity, Indian Economy.*

## 1. INTRODUCTION:

Foreign Direct Investment (FDI) is a crucial component of the global economy, influencing economic landscapes worldwide through investments in assets or enterprises located in another country. This form of investment, including mergers and acquisitions, joint ventures, and wholly-owned subsidiaries, significantly impacts global economic dynamics, offering benefits to both host and home countries. In host countries, FDI can stimulate economic growth through job creation, technology transfer, and infrastructure development, contributing to overall prosperity. In home countries, FDI provides access to new markets and resources, leading to increased revenue and economic expansion. FDI also brings substantial capital into host countries, which can be channelled into sectors such as infrastructure development, research and development, and funding new projects. FDI also generates employment opportunities, particularly in regions with high unemployment rates, and boosts a country's export capacity. It also stimulates competition in host markets, resulting in enhanced efficiency and productivity. For multinational corporations, FDI offers the advantage of diversifying risks across different countries and markets, contributing to long-term stability. FDI often leads to significant investments in the host country's infrastructure, benefiting the local population and enhancing the host country's attractiveness for further investments. However, FDI also presents challenges such as sovereignty, environmental impact, labour standards, and income inequality. As the global economy continues to evolve, FDI will undoubtedly play a pivotal role in shaping its future.

India has become a significant player in the global investment scene due to its vast and young population, economic restructuring, technological innovation, infrastructure growth, and forward-thinking foreign direct investment regulations. With over 1.3 billion people, India is a vibrant consumer market, making it a desirable location for companies looking to expand their staff. The country has also taken the lead in enacting economic changes to improve its investment environment, such as simplifying the Goods and Services Tax (GST) and implementing initiatives like



"Make in India." India's booming technology and innovation sector has attracted international investment, particularly in the IT and software sectors. The government's initiatives like "Smart Cities" and "Digital India" have also boosted infrastructure development, offering opportunities for investment in sectors like technology, energy, and transportation. India's increasing prominence can be attributed to recent modifications to its foreign direct investment (FDI) policy, which has led to increased foreign investment. India's geopolitical stance in South Asia also contributes to its importance in the global investment stage. India's increasing status in the global investment arena is attributed to its favourable demographics, economic restructuring, technological innovation, infrastructure growth, and forward-thinking regulations.

Studying the spillover effects of Foreign Direct Investment (FDI) on the Indian economy is crucial for several reasons. FDI can significantly impact economic growth, employment, and technology transfer. It influences the competitiveness of domestic industries, trade balance, and regional development. Understanding these effects is essential for informed policy formulation, investment promotion, and ensuring that FDI contributes to sustainable development, innovation, and job creation in India. Foreign Direct Investment (FDI) inflow has both potential benefits and challenges. Benefits include economic growth, job creation, technology transfer, access to global markets, and infrastructure development. However, challenges encompass economic dependence, loss of sovereignty, unequal distribution of benefits, competition for resources, and vulnerability to economic shocks. Host countries must balance these factors to maximise the advantages of FDI while addressing its drawbacks.

## **2. LITERATURE REVIEW:**

Chakraborty and Nunnenkamp's (2008) study explores the effects of FDI on economic growth in India, particularly in the post-reform period. They use Granger causality tests and a panel cointegration methodology to analyse industry-specific FDI and output data. Their findings reveal that the impact of FDI varies across sectors, with a positive correlation between FDI and output in the manufacturing sector, while the primary sector shows no causal link. Interestingly, there are brief effects of FDI on the service sector output and cross-sector spillovers from FDI in services fuel development in the manufacturing sector. This study highlights the sectoral nuances of FDI's impact on economic growth. Merajoth's (2020) research focuses on the relationship between FDI and India's GDP from 2000 to 2019. The study employs secondary data from the Reserve Bank of India and utilises simple linear regression to analyse the data. The research concludes that FDI significantly impacts India's GDP, with a p-value for FDI lower than 0.05, leading to the rejection of the null hypothesis. This study provides a valuable perspective on the role of FDI in driving India's economic growth over a substantial time frame. Sahoo and Mathiyazhagan's (2003) study investigates the influence of FDI on export promotion and economic growth in India from 1979-1980 to 2000-2001. They employ the Johansen cointegration test and find a long-term relationship between exports, FDI, and GDP. When GDP is replaced with the Index of Industrial Production (IIP), the same relationship is observed. However, the study highlights that the positive elasticity coefficients between FDI, GDP, and FDI, IIP are smaller compared to the coefficients for exports. This suggests that FDI may not be as critical for Indian economic expansion as exports, emphasising the importance of export-oriented sectors in fostering overall economic growth. Tyagi and Pajja's (2021) study focuses on the dynamic relationships between energy security, trade openness, economic output, energy use, FDI, carbon emissions, and trade in India from 1978 to 2016. They employ various econometric techniques, including VECM Granger causality tests and time series econometric modelling based on the ARDL model. The findings suggest a long-term connection between energy output, CO<sub>2</sub> emissions, and FDI. The study concludes that FDI should be used to adopt energy-efficient practices to reduce carbon emissions in India, and the government can encourage FDI in renewable energy sectors to achieve sustainable economic development. Dinh and Nguyen (2019) study examines the short- and long-term effects of FDI on economic growth in developing nations belonging to the lower-middle-income group from 2000 to 2014. They employ a range of econometric techniques, including the Johansen cointegration test, FMOLS, VECM, and panel-based unit root test. The findings indicate a short-term negative impact of FDI, which ultimately contributes to economic growth in the countries analysed. Other macroeconomic factors also play a role in economic growth. Korsah and Amanamah's (2022) study investigates the factors influencing FDI inflows in 16 West African countries from 1989 to 2018. They analyse the relationship between FDI and various macroeconomic indicators. The study identifies factors such as natural resource abundance, market size, trade openness, exchange rates, and language (French vs. English) as key determinants of FDI inflows in West African countries. The study provides insights into the drivers of FDI in the region. Chaudhury and Nanda's (2020) research focuses on the impact of sectoral composition on FDI's effects on economic growth in South Asian countries. The study employs a comprehensive approach to examine the dynamics of sectoral and overall FDI inflow in South Asian countries. The findings suggest that the sectoral composition of FDI



indeed affects its impact on economic growth in South Asia. Pegkas (2015) examines the relationship between FDI and economic growth in Eurozone countries from 2002 to 2012. The study uses panel data estimations and finds a positive long-run relationship between the stock of FDI and economic growth in Eurozone countries. The study provides insights into the role of FDI in fostering economic growth in the Eurozone. Mehic and Hodovic's (2016) study investigates the impact of FDI on economic growth in southeast European transition nations for the years 1998-2007. The study employs panel-corrected standard errors and finds a statistically significant and positive impact of FDI on economic growth. The results hold up even when endogeneity issues are considered. Zekarias (2016) examines the effect of FDI on economic growth in 14 Eastern African countries from 1980 to 2013. The study employs dynamic GMM estimators and finds a positive and marginally significant impact of FDI on economic growth. The study suggests that FDI is a major driver of economic growth and conditional convergence in Eastern Africa. Azman and Law's (2010) research, employing a threshold regression model, explores the impact of FDI on economic growth concerning the development of financial markets. They find that FDI has a positive effect on growth only after a certain level of financial market development is reached, while its benefit is zero before that point. This study contributes to understanding the conditions under which FDI positively influences economic growth. Antwi and Mills (2013) examine the relationship between FDI and economic growth in Ghana from 1980 to 2010 using time series data. They employ simple ordinary least square (OLS) regressions and find that GDP, GDP growth rate, GNI, industry value added, trade, and other variables significantly explain FDI and have an impact on FDI in Ghana. The study provides insights for investors, governments, and policymakers interested in Ghana's economic development. Athukorala's (2003) study focuses on Sri Lanka's experience with FDI inflows and their impact on economic growth. The research utilises time series data from 1959 to 2002 and employs the error correction mechanism and cointegration econometric framework. The findings suggest that there is limited evidence supporting a positive correlation between FDI and growth in Sri Lanka, emphasising the importance of other factors affecting FDI's impact, such as investment climate and governance issues. Ray's (2012) study investigates the causal relationship between FDI and economic growth in India from 1990-1991 to 2010-2011. The research employs the cointegration approach and Granger causality tests. The results indicate a positive relationship between GDP and FDI. The findings suggest that India can enhance its economic growth by focusing on improving infrastructure, human resources, and the investment climate to make FDI a more significant contributor. Farka (2012) conducted a unified study on absorptive capacities and their impact on FDI spillovers. The study investigates how the host nation's ability to absorb technology influences the effects of FDI on economic growth. Farkas finds that FDI has a positive and significant impact on growth, particularly in nations with developed financial markets and human capital. The study emphasises that FDI should complement other growth determinants. Fujimori and Sato's (2015) research examines the spillover effects of FDI in Indian manufacturing industries during the capital liberalisation period. They use a Cobb–Douglas production function and find that FDI stock increases total factor productivity (TFP), particularly through backward linkage. This study sheds light on the positive impact of FDI spillovers on productivity. Ramaswamy and Dhanapal (2017) focus on the effect of spillover FDI on regional productivity in Indian states. The research finds that FDI significantly affects regional productivity in India, with factors like R&D, technology imports, human capital, and different FDI specifications playing a role. The study contradicts the idea of a resource curse in Indian states, highlighting the positive effects of regional FDI penetration on productivity. Wooster and Diebel (2010) examined studies on technological spillovers from FDI in developing nations. They find that spillover effects are more pronounced when examining their impact on output and are more likely to be significant in Asian countries. The study suggests that model misspecification may have influenced observed spillover effects from FDI in developing nations. This meta-analysis contributes to understanding the patterns and significance of FDI spillovers. Sarif, Khalifah and Suyanto (2016) The impact of foreign direct investment (FDI) on productivity within both developed and developing nations has garnered significant attention in recent economic research. Various studies have explored the relationship between FDI, productivity, and efficiency within different contexts. Sari, Khalifah, and Suyanto (2016) delve into the productivity performances of firms within the Indonesian manufacturing industry, employing a non-parametric test and a time-varying stochastic frontier approach. Their findings highlight intriguing insights, including the nuanced interplay between foreign and domestic companies. Despite foreign companies exhibiting lower efficiency, they demonstrate greater productivity, with growing foreign ownership displaying complex dynamics by simultaneously impacting productivity and efficiency. Notably, the study emphasises the positive horizontal spillover effects of FDI on both efficiency and productivity, underlining the intricate nature of foreign investment impacts on local industries. Furthermore, the analysis reveals the intricate role of technological advancements, shifts in technical efficiency, and scale efficiency in contributing significantly to the explanation of Total Factor Productivity (TFP) growth, providing a comprehensive understanding of the multifaceted effects of FDI in the manufacturing sector in Indonesia. Tintin (2012) investigates the impact of FDI on productivity across a broader temporal spectrum, ranging from 1984 to 2008, encompassing both developed and developing nations. Employing panel cointegration and panel estimation techniques,



the study identifies the long-term relationships between FDI and various productivity metrics. The research emphasises the divergent impact of FDI on labour productivity versus total factor productivity, indicating the significant influence of FDI on labour productivity while highlighting its relatively insufficient impact on total factor productivity. Additionally, the study uncovers the role of labour force quality, as evidenced by Bonthuis' labour quality index (2010), in shaping the effects of FDI on productivity in different national contexts, further underscoring the nuanced dynamics of FDI's impact based on the quality of the local labour force.

**3. PROBLEM STATEMENT :**

Despite the growing significance of Foreign Direct Investment (FDI) in the Indian economy, there exists a gap in understanding the spillover effects of FDI on Total Factor Productivity (TFP). The existing literature provides insights into the impact of FDI, but it becomes critical to analyse these impacts over a timeframe that considers the current period as well. This research seeks to address this timeframe gap by examining the relationships between FDI inflow, key macroeconomic variables, and TFP in the context of India.

**4. OBJECTIVES:**

- To assess the spillover effects of FDI inflow on Total Factor Productivity (TFP).
- To identify key macroeconomic factors influencing TFP in the presence of FDI inflow.

**Variables and their measurement**

| Variables  | Abbreviation                                | Unit           |
|------------|---|----------------|
| TFP        | Total Factor Productivity in India          |                |
| FDI INFLOW | Foreign Direct Investment Inflow in India   | current US\$   |
| GCF        | Gross capital formation in India            | % of GDP       |
| RL         | Rail lines in India                         | total route-km |
| IIE        | Investment in energy in India               | current US\$   |
| IIT        | Investment in transport in India            | current US\$   |
| GDP        | Gross Domestic Product growth rate in India | %              |
| INFLA      | Inflation in India                          | %              |

**Data Collection**

For this study, secondary time series data has been collected from 1991 - 2022. Sources such as the World Bank and Federal Reserve Economic Data were used to collect the time series data.

**Model specification**

$$TFP = \beta_0 + \beta_1 FDI\_INFLOW + \beta_2 GCF + \beta_3 RL + \beta_4 IIE + \beta_5 IIT + \beta_6 GDP + \beta_7 INFLA + \epsilon$$

where,

- TFP = Total Factor Productivity
- FDI\_INFLOW = Foreign Direct Investment Inflow
- GCF = Gross capital formation
- RL = Rail lines
- IIE = Investment in energy
- IIT = Investment in transport
- GDP = Gross Domestic Product growth rate
- INFLA = Inflation

Total Factor Productivity (TFP) is a measure of the overall efficiency with which inputs (such as labour and capital) are used in production. It is often used as an indicator of economic performance and can be employed to measure the spillover effects of foreign direct investment (FDI) on a host country's economy. In this context, TFP has been used to measure the spillover effects of foreign direct investment (FDI) in the analysis.



## 5. ANALYSIS:

Regression analysis was carried out using the model as stated earlier. The results are as follows

| Variable           | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------------|-------------|------------|-------------|--------|
| FDI_INFLOW         | 2.13E-12    | 5.04E-13   | 4.21688     | 0.0007 |
| GCF                | -0.001294   | 0.001203   | -1.075669   | 0.298  |
| RL                 | 2.55E-05    | 4.76E-06   | 5.352034    | 0.0001 |
| IIE                | -2.40E-13   | 7.19E-13   | -0.333849   | 0.7428 |
| IIT                | 1.60E-12    | 9.86E-13   | 1.619316    | 0.1249 |
| GDP                | 0.006169    | 0.002341   | 2.635211    | 0.018  |
| INFLA              | -0.003112   | 0.001706   | -1.824666   | 0.0868 |
| C                  | -0.81828    | 0.314403   | -2.602646   | 0.0192 |
|                    |             |            |             |        |
| R-squared          | 0.973668    |            |             |        |
| Adjusted R-squared | 0.962148    |            |             |        |

Based on the model, the regression analysis provides a deep insight into the determinants of Total Factor Productivity (TFP). TFP, which represents the efficiency and productivity of India's inputs in generating economic output, is influenced by various factors investigated in this study. Foreign Direct Investment Inflow (FDI\_INFLOW) appears as a critical driver of TFP among the independent factors. The fact that FDI\_INFLOW is a positive and statistically significant coefficient (2.13E-12) shows that an increase in foreign direct investment adds positively to Total Factor Productivity. This is consistent with economic theory because FDI is frequently associated with technology transfer, managerial know-how, and greater competitiveness, all of which can boost total productivity.

Rail infrastructure (RL) also has a substantial impact on TFP. The positive coefficient (2.55E-05) suggests that rail line growth favourably corresponds with Total Factor Productivity. This finding emphasises the significance of effective transport networks in allowing the movement of products and people, ultimately contributing to higher productivity across a variety of economic sectors.

GDP Growth Rate (GDP) emerges as another important element impacting TFP. The presence of a positive coefficient (0.006169) indicates that higher GDP growth rate is connected with higher Total Factor Productivity. This can be understood in India, a developing economy, as innovations in technology, greater human capital, and general improvements in resource allocation efficiency.

Gross Capital Formation (GCF), which measures the rate at which an economy accumulates new physical assets, has no statistically significant impact on TFP. This finding implies that, within the parameters of the model, capital formation may not be a significant predictor of Total Factor Productivity. It calls for more research into the relationship between capital accumulation and productivity gains, taking into account potential interactions with other factors. TFP is not statistically associated with investment in energy (IIE) or investment in transportation (IIT). This suggests that, based on the model's factors, investments in these specific industries may not be substantial drivers of Total Factor Productivity.

The variable Inflation (INFLA) has a negative coefficient. This implies that higher levels of inflation are connected with a decline in Total Factor Productivity. Because both high and low inflation can have complex consequences on economic dynamics, the impact of inflation on productivity deserves careful attention.

The model gives a solid description of the factors impacting Total Factor Productivity, as evidenced by the high R-squared value of 0.973668. The favourable correlations between FDI\_INFLOW, RL, and GDP highlight the significance of foreign investment, solid transport infrastructure, and overall economic growth in driving productivity improvements. The non-significant impact of GCF, IIE, and IIT, on Total Factor Productivity, shows that these variables may need further analysis or consideration of additional variables to completely capture their influence on Total Factor Productivity. These findings provide useful insights for policymakers and stakeholders trying to improve economic output.



## 6. FINDINGS:

The findings indicate that Foreign Direct Investment (FDI) inflow, the number of Rail Lines (RL), and the Gross Domestic Product growth rate (GDP) are significant positive drivers of Total Factor Productivity (TFP) in the Indian economy. FDI inflow positively impacts productivity, reflecting the benefits of capital, technology, and expertise brought in by foreign investment. Rail infrastructure and GDP growth are identified as key contributors to productivity. The negative coefficient for inflation implies that higher inflation is associated with a reduction in Total Factor Productivity. This finding is in line with economic theories that suggest inflation, especially when unpredictable or high, can introduce uncertainty and inefficiencies into the economy, affecting productivity. However, variables such as Gross Capital Formation (GCF), Investment in Energy (IIE), and Investment in Transport (IIT), do not demonstrate robust significance in explaining TFP in this specific context. The findings highlight the context-dependent nature of economic variables and underscore the crucial role of FDI, rail infrastructure, inflation and GDP growth in fostering productivity.

## 7. CONCLUSION:

In conclusion, this research has delved into the dynamics of Foreign Direct Investment (FDI) and its spillover effects on the Total Factor Productivity (TFP) within the Indian economic landscape. The investigation not only shed light on the individual contributions of various factors but also revealed the interplay between foreign investments, infrastructure development, economic activity, and inflation.

The relationships uncovered underline the multifaceted nature of economic growth, where the impact of FDI goes beyond mere financial inflows. The findings suggest that the effectiveness of FDI in enhancing TFP is dependent upon various factors, such as the type of infrastructure investments and the prevailing economic conditions. Recognizing these nuances is crucial for devising targeted and impactful policy measures.

Moreover, the study's emphasis on the potential impact of rail infrastructure investments signifies the importance of strategic sectoral planning. Policymakers can leverage these insights to prioritise and tailor infrastructure development initiatives that not only accommodate FDI but also foster long-term productivity gains.

## 8. LIMITATION AND FUTURE RESEARCH:

The study is based on the available data and assumptions made during the modelling process. Due to certain missing data, the sample while doing the regression analysis was adjusted to the years 1996 - 2019.

Examining the influence of Gross Capital Formation and investments in energy and transportation on Total Factor Productivity is required to understand its economic relationship.

For future research, studies should consider focusing on policies or initiatives that encourage Foreign Direct Investment and rail infrastructure development, as these factors are connected with higher Total Factor Productivity.

It's essential to note that measuring spillover effects through TFP can be complex, and results may vary depending on the specific context and data available. Additionally, the method may not capture all aspects of spillover effects, such as changes in product quality or consumer welfare, which may require complementary analysis. The study assumes linear relationships, and exploring non-linear relationships could provide additional insights. External factors, global economic conditions, and geopolitical influences were not explicitly considered and could be the focus of future research.

## REFERENCES:

1. Chakraborty, C., & Nunnenkamp, P. (2008). Economic reforms, FDI, and economic growth in India: a sector level analysis. *World development*, 36(7), 1192-1212.
2. Merajothu, D. N. (2020). An empirical study on foreign direct investments impact on economic growth of India. Available at SSRN 3598037.
3. Sahoo, D., & Mathiyazhagan, M. K. (2003). Economic growth in India: " does foreign direct investment inflow matter?". *The Singapore Economic Review*, 48(02), 151-171.
4. Nepal, R., Paija, N., Tyagi, B., & Harvie, C. (2021). Energy security, economic growth and environmental sustainability in India: does FDI and trade openness play a role?. *Journal of Environmental Management*, 281, 111886.
5. Dinh, T. T. H., Vo, D. H., The Vo, A., & Nguyen, T. C. (2019). Foreign direct investment and economic growth in the short run and long run: Empirical evidence from developing countries. *Journal of Risk and Financial Management*, 12(4), 176.
6. Korsah, E., Amanamah, R. B., & Gyimah, P. (2022). Drivers of foreign direct investment: new evidence from West African regions. *Journal of Business and Socio-economic Development*.



7. Chaudhury, S., Nanda, N., & Tyagi, B. (2020). Impact of FDI on economic growth in South Asia: Does nature of FDI matters?. *Review of Market Integration*, 12(1-2), 51-69.
8. Pegkas, P. (2015). The impact of FDI on economic growth in Eurozone countries. *The Journal of Economic Asymmetries*, 12(2), 124-132.
9. Mehic, E., Silajdzic, S., & Babic-Hodovic, V. (2013). The impact of FDI on economic growth: Some evidence from Southeast Europe. *Emerging Markets Finance and Trade*, 49(sup1), 5-20.
10. Zekarias, S. M. (2016). The impact of foreign direct investment (FDI) on economic growth in Eastern Africa: Evidence from panel data analysis. *Applied Economics and Finance*, 3(1), 145-160.
11. Azman-Saini, W. N. W., & Law, S. H. (2010). FDI and economic growth: New evidence on the role of financial markets. *Economics Letters*, 107(2), 211-213.
12. Antwi, S., Mills, E. F. E. A., Mills, G. A., & Zhao, X. (2013). Impact of foreign direct investment on economic growth: Empirical evidence from Ghana. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 3(1), 18-25.
13. Athukorala, P. P. A. W. (2003, November). The impact of foreign direct investment for economic growth: A case study in Sri Lanka. In *9th International Conference on Sri Lanka Studies* (Vol. 92, pp. 1-21).
14. Ray, S. (2012). Impact of foreign direct investment on economic growth in India: A cointegration analysis. *Advances in Information Technology and Management*, 2(1), 187-201.
15. Farkas, B. (2012). Absorptive capacities and the impact of FDI on economic growth.
16. Fujimori, A., & Sato, T. (2015). Productivity and technology diffusion in India: The spillover effects from foreign direct investment. *Journal of Policy Modeling*, 37(4), 630-651.
17. Ramasamy, M., Dhanapal, D., & Murugesan, P. (2017). Effects of FDI spillover on regional productivity: Evidence from panel data analysis using stochastic frontier analysis. *International Journal of Emerging Markets*, 12(3), 427-446.
18. Wooster, R. B., & Diebel, D. S. (2010). Productivity spillovers from foreign direct investment in developing countries: A meta-regression analysis. *Review of Development Economics*, 14(3), 640-655.
19. Sari, D. W., Khalifah, N. A., & Suyanto, S. (2016). The spillover effects of foreign direct investment on the firms' productivity performances. *Journal of Productivity Analysis*, 46, 199-233.
20. Tintin, C. (2012). Foreign direct investment, productivity spillovers and labour quality. *International Journal of Economics and Finance Studies*, 4(1), 57-66.