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Examining the Influence of FDI in Food Processing Industry of India on Domestic Investment Through DOLS

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Abstract
Foreign direct investment is considered the primary substitute source of finance for business firms. The level of foreign investment serves as a key indicator of a country's growth potential. The Food processing industry is an unexplored sector that has huge potential to navigate the economic growth of India. The Food processing industry is expected to contribute approx 20% to India's GDP by 2030. Through extensive literature review, it has been found that no study investigates the impact of FDI in the food processing industry of India on domestic investment in the food processing industry. This study establishes a connection between Foreign Direct Investment in the food processing industry and domestic investment in the food processing industry of India. To analyze the time series data from 2003 to 2023, co-integration and Dynamic Ordinary Least Square **(**DOLS) methods have been employed.

Keywords: *FDI, Food Processing Industry, DOLS, Co-integration Test*

Introduction

A key variable in stimulating economic development and stability is foreign investment. Many nations have aggressively lowered barriers that draw foreign investment in the last few decades to increase tax receipts, create jobs, and absorb important knowledge from foreign businesses (Kenh and Wei, 2023). In other words, it can be trusted that the development of economic growth is a result of the inflow of FDI (Karahan and Colak, 2022).

Economic development, local investment, and trade openness are the main variables that influence foreign direct investment (FDI) (Romdhane and et al, 2022). India is a developing nation major chunk of the population directly or indirectly dependent on agriculture and allied activities. While foreign direct investment in enterprises related to agriculture contributes to approx 1.7% of total inflows, the agricultural sector accounts for around 18% of India's GDP overall. The food processing industry serves as a link between agriculture and industrial sectors, playing a vital role in improving agricultural productivity and creating value addition.

Domestic investment is considered as the most significant source of capital for economic growth (Lean and Tan, 2011), whereas the FDI impact on economic growth is volatile. Domestic investment is equally important for job creation alongside economic development. Some of the studies (Dusa, 2007 and Pradhan, 2009) have argued that the role of FDI in economic growth is inconsistent. A large amount of studies have favored FDI's crucial role in economic development and promotion of domestic investment as well. The relationship between FDI and domestic investment in India's food processing sector is insufficiently examined and requires additional research to clarify its potential for fostering sustainable growth.

Recent years have witnessed an increase in foreign investment in India's food processing industry by 8 times from 2011 to 2022. The contribution of the food processing industry to the GDP of India has increased at an average rate of 9.97% p.a. from 2014-15 to 2020-21, as a result, the food processing sector contributes 8% of India's GDP. With accelerated foreign investment and continuous increase in GDP contribution food processing sector is proving its vital role in the overall growth of India. This growth underscores the sector's capacity to draw foreign investment and its potential to enhance associated industries such as agriculture, packaging, and logistics, thus generating a multiplier effect on the economy. The goal of the food processing industry is to raise its present 8% GDP contribution to 20% within the next five to ten years (ToI, 2023).

To fuel the growth potential of the food processing industry, relying on foreign investment is not enough, contribution of domestic investment is equally essential. In this study bank credit has been used as a proxy to domestic investment. In the last two decades, bank credit to the food processing industry has increased 20 times, from Rs. 86 billion in 2003 to Rs. 1828.78 billion in 2023. The notable increase in domestic financial support reflects heightened confidence among local financial institutions and stakeholders regarding the growth potential of the food processing industry. Furthermore, it demonstrates the sector's ability to produce stable returns and its strategic significance within India's economic framework.

In this study, we are trying to look into the effect of foreign investment in the food processing industry on the economic growth of India. This research comprises five sections. Sector 2 is a brief review of the literature. Section 3 is the methodological approach, model specification, and data sources. Section 4 is the analysis of data and section 5 is the summary of findings and conclusions. This research's findings are anticipated to yield substantial policy implications, offering insights for policymakers to develop a balanced framework that optimizes the advantages of foreign investment while promoting strong domestic investment. This can inform strategies to better integrate the food processing sector into the overall economic growth framework, promoting sustainable development and increased employment opportunities.

Review of Literature

There is exhaustive literature that explains the impact of FDI on economic development and domestic investment. However, a very few literature explore the impact of FDI in the food processing industry of India on domestic investment in the food processing industry. In this study we have covered the suitable and relevant literature on FDI and economic development, FDI and food processing industry, FDI and domestic investment.

Foreign Direct Investment and Economic Development

Foreign direct investment (FDI) is widely acknowledged as an important supplementary capital source for the economic advancement of developing nations. However, the ability of recipient nations to absorb FDI determines its positive benefits on economic expansion. For foreign direct investment to have growth-promoting impacts, there must be a strong financial system (Hagan and Amoah, 2020). Economic advancement is positively and significantly impacted by foreign investment, provided that there is a sizable pool of highly skilled laborers (Anetor, 2020). While economic policies and reforms serve as foundations for drawing in foreign direct investment (FDI), it's important to understand that depending only on them might not be sufficient. Achieving sustainable FDI also necessitates strategic marketing that highlights the nation's strengths and advantages (Musila and Sigue, 2006). Innovative industries play a crucial role in garnering Foreign Direct Investment (FDI) because of their greater capacity to embrace innovations, technology transfers, and educational outcomes. This is evident in the heightened productivity observed within these sectors (Kosztowniak, 2022). Another study by Tahir and Alam, 2020, discovered that the amount of Foreign Direct Investment (FDI) and the banking sector's performance are strongly interrelated. To attract more FDI, projects having FDI funding should be provided credit by domestic commercial banks.

Beyond a doubt, the cultural composition of a country influences how well foreign direct investment (FDI) streams. In nations with higher levels of traditionalism, the repercussions become negative; in more secular cultures, they become advantageous. Furthermore, we see that FDI has a greater impact on growth in individualistic societies rather than collectivistic ones (Romero and Edwards, 2020). The study (Shawl and Makina, 2022) shows that FDI inflow has a noteworthy and favorable influence on economic development when it interacts with variables including trade openness, financial development, and human capital.

Foreign Direct Investment and Food Processing Sector

Foreign Direct Investment (FDI) plays a crucial role in the development and growth of various sectors, including the food processing industry. Inflow of FDI to agriculture depends on two determinants agriculture market size and agriculture import. Agriculture market size has positive impact on the foreign investment. Government should strict the import of agriculture and device policies for attracting FDI in agriculture (Lv et al., 2010). A study (Djokoto et al., 2014) suggests that domestic investment in agriculture has positive impact on FDI to agriculture sector. It can be further stated that both domestic investment and agriculture are complimentary to each other. A study by Padhi (2022), suggests that FDI originated from developed nation in food processing sector of emerging countries depends on highly skilled worked forces. Several studies have explored the impact of FDI on different aspects of the food processing sector in various countries. For example, Hlanze et. al. (2020) investigated the influence of the investment climate on the productivity of food and beverages industries in Eswatini. Additionally, Campenhout et. al. (2021) explored the role of FDI in dairy value chain upgrading in Uganda. The study identified key innovations within the dairy value chain driven by increased demand and liberalization policies. Furthermore, Kumari et. al. (2021) applied a multiple regression model to determine the impact of FDI and exports on the economic growth of the food processing industry in India. This study highlighted the importance of FDI and exports in driving economic growth within the food processing sector. Although India has open policy for FDI in food processing sector but lack of specialized labour has negative impact on FDI inflow.

FDI and Domestic Investment

A study by Bakari and Tiba, 2019 have found that domestic investment has positive impact on economic growth of a nation on the other hand FDI and export have negative impact on economic growth. Further Ahmad et al, 2018 in their research have established that domestic investment has significant impact on the economic growth whereas foreign investment in agriculture has either neutral or negative impact in attracting domestic investments. Shah et. al. (2020) focused on sectoral FDI inflows and domestic investments in Pakistan, highlighting the importance of understanding the dynamics of FDI to stimulate sustainable growth. Similarly, Gochero et. al. (2020) examined the effect of mining FDI inflows on the economic growth of Zimbabwe, emphasizing the significant positive relationship between FDI in the mining sector and the country's GDP in the long run. In Vietnam, Nguyen et. al. (2020) investigated the dynamic relationship between greenfield investments, cross-border M&As, domestic investment, and economic growth. Their findings provide important implications for policies aimed at attracting FDI to promote sustainable growth. Drapkin et. al. (2020) studied the influence of FDI on domestic investment in the Russian economy, suggesting that government policies should focus on mitigating the effects of pushing national companies off the market and fostering cooperation between foreign and domestic companies. Lastly, Maitra (2021) investigated the relative role of external debt, FDI, and domestic investment in economic growth in Sri Lanka, using the autoregressive distributed lag (ARDL) bounds testing approach to analyze the long-run associations of income with different combinations of debt, FDI, and domestic investment. These studies collectively contribute to the understanding of the relationship between FDI and domestic investment in various countries and regions.

Methodological approach and data source

Methodological approach

Philips-Ouliaris Co-integration Test

To determine the long-term relationship between two variables in a time series, the Philips-Ouliaris cointegration test is used. Philips-Ouliaris co-integration test implies variables of time series move together despite short-run fluctuations. To ascertain the stationarity of time series data, the unit root test is run in the first stage. If both the variables are found to be non-stationary then regressing one variable over the other is performed. The null hypothesis is that the variables are not co-integrated. The rejection of the null hypothesis signifies a long-term equilibrium relationship between the variables, rendering it a crucial instrument in time series analysis. The findings indicate a significant long-run relationship between FDI and domestic investment, suggesting that these variables exhibit synchronous movement over time, regardless of short-term variations. This supports the hypothesis that foreign investments significantly enhance the stability and growth of domestic financial activities within the food processing sector.

Dynamic Ordinary Least Square (DOLS)

The Dynamic ordinary least square method is applied to calculate the co-integration relation among non-stationary variables of time series data. DOLS at first convert non-stationary time series to stationary then ordinary least square is applied. DOLS includes time series dynamics and correct autocorrelation errors. It also addresses endogeneity and serial correlation, yielding robust estimates for long-term relationships in economic models.

Data source

In this study, secondary data from 2003 to 2023 has been analyzed. Major sources of data are hand book on Statistics of India published by the Reserve Bank of India, data released by the department for promotion of industry and internal trade (DPIIT) of India and statistics published by Ministry of Statistics and Programme Implementation of India. The dependent variable is the domestic investment proxy of credit sanction to the food processing industry by commercial banks of India and the independent variable is an inflow of foreign direct investment in the food processing sector of India. The data has undergone thorough verification to guarantee accuracy and consistency, supplemented by pertinent industry reports for enhanced insights. Table-1 represents the extended meaning of the abbreviation used in the study. This data collection provides a thorough understanding of the relationship between FDI inflows and domestic investment in India's food processing sector.

Table-1: Meaning of abbreviations

Abbreviation	Extended Meaning
FDI	Inflow of FDI in Food Processing Sector of India
DI	Domestic Investment (credit sanction to food processing industry)

Analysis and Interpretation

Philips-Ouliaris Co-integration Test

Table-2 exhibits results of Philips-Ouliaris Co-integration test. This test is used to determine the presence of co-integrating relationship among FDI and domestic investment. The value in the table represents the p-value (0.04572) which is less than 0.05 level of significance. Hence null hypothesis can be rejected. Null hypothesis states that there is no long-run relationship between FDI in food processing industry and domestic investment. Result implies that FDI and domestic investment has long-run relationship, indicating variables moves together over time despite short-run fluctuation.

Table-2: Co-integration Test Result for FDI and Domestic Investment

Null Hypothesis	p-value	Significance Level
There is no co-integration relationship between FDI and Domestic Investment	0.04572	0.05
Turncation Lag	0	
Intercept Included	Yes	

DOLS

Table-3 displays the result of DOLS. Coefficient for FDI is 0.05699, it means that change in FDI inflow will result in positive change in domestic investment. p-value is 0.0282 at a significance level of 5%, indicating FDI inflow in food processing industry has moderate influence on domestic investment. These findings highlight that FDI plays a supportive role in driving domestic investment and underscores the interconnectedness of foreign and local capital flows.

Table-3: DOLS Result

Dependent Variable: **Domestic Investment** Included Observations: **20**				
Variables	Coefficient	t-statistics	p-value	Significance Level
Intercept	772.53	5.266	5.24	0.0
FDI	0.05699	2.387	0.0282	0.05
Multiple R^2			0.2404	
Adjusted R^2			0.1982	

This analysis indicates that the influence of FDI on domestic investment, while not definitive, is significant and reflects a synergistic relationship that may contribute to economic stability and growth. This relationship highlights the complementary functions of foreign and domestic capital in promoting economic development. The interplay indicates that foreign direct investment (FDI) functions as both an external capital source and a catalyst for local investments by improving infrastructure, increasing investor confidence, and promoting innovation in the food processing sector. This dynamic establishes a virtuous cycle in which heightened domestic investments attract foreign direct investment (FDI), resulting in sustained economic growth. Consequently, policies designed to balance and integrate both investment sources are essential for sustainable development.

Conclusion

Foreign Direct Investment (FDI) is essential for promoting economic and technological progress. The consistent influx of foreign direct investment into the food processing industry over the last twenty years highlights the sector's growth potential and its rising appeal to international investors. This trend indicates the strategic significance of the food processing sector within India's overall economic framework. The findings from the Philips-Ouliaris Co-integration test indicate a long-run relationship between FDI and domestic investment, suggesting an interconnection between these variables over time. The Dynamic Ordinary Least Squares (DOLS) analysis indicates that FDI inflow has a positive, moderate, and statistically significant effect on domestic investment. The findings underscore the complementary and nuanced role of foreign direct investment in stimulating domestic investment in the food processing sector. Future research may broaden its focus by including additional variables beyond FDI inflow, such as government policies, technological advancements, market dynamics, and infrastructure development. Examining these dimensions enhances the understanding

of the factors affecting domestic investment in India's food processing sector, thus assisting policymakers in formulating more effective strategies for sustainable growth.

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