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Survey on Foreign Collaboration in Indian Industry: 2021–2023

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A B S T R A C T

This study examines the landscape of foreign technical collaborations (FTCs) in Indian industry during the financial years 2021–2023. Drawing on data from the Reserve Bank of India's biennial survey, the analysis highlights the predominance of the manufacturing sector, accounting for 78% of FTCs, with significant contributions from machinery, transport equipment, and chemical products. Japan, the USA, and Germany emerge as the leading sources of technology transfer. The study also explores the nature of technology transfers, payment modalities, and the impact on production growth, particularly in the motor vehicles sector. The findings provide insights into the dynamics of foreign collaborations and their implications for India's industrial growth

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INTRODUCTION

Foreign collaboration has been a cornerstone of India's industrial development, playing a pivotal role in fostering technological advancements, enhancing production capabilities, and integrating global best practices into domestic industries. Over the years, these collaborations have contributed significantly to the modernization of Indian industries, particularly in the manufacturing sector, while also positively impacting the services and infrastructure sectors.

The Reserve Bank of India (RBI) conducts biennial surveys to analyze the trends and patterns of foreign technical collaborations (FTCs) in Indian industries. The 2021–2023 survey provides valuable insights into the extent and nature of these collaborations, highlighting the role of foreign partnerships in driving industrial growth amidst global economic uncertainties. The survey, covering responses from 709 Indian companies, outlines the predominance of the manufacturing sector, with 78% of FTCs attributed to it. Sectors such as machinery, transport equipment, and chemical products have shown the highest engagement in FTCs, while Japan, the USA, and Germany have emerged as key partners.

This paper delves into the findings of the RBI survey, offering an in-depth analysis of sectoral trends, technology transfer modalities, and the economic implications of FTCs. It seeks to understand the dynamics of foreign collaborations in shaping India's industrial landscape, contributing to the country's goal of becoming a global manufacturing hub.

LITERATURE REVIEW

Foreign collaborations have long been recognized as a catalyst for industrial growth, particularly in developing economies like India. The Reserve Bank of India's (RBI) biennial surveys on foreign technical collaborations (FTCs) serve as a vital resource for understanding these partnerships and their impact on India's industrial development. The latest survey for 2021–2023 highlights key trends in sectoral participation, the nature of technology transfers, and their contributions to production growth (Reserve Bank of India, 2023).

Several studies have explored the role of FTCs in enhancing industrial productivity. Gupta et al. (2022) noted that collaborations with advanced economies like Japan, the USA, and Germany have enabled Indian firms to access cutting-edge technologies, resulting in improved product quality and operational efficiency. Similarly, Sharma and Kumar (2021) emphasized that the manufacturing sector continues to dominate FTCs, reflecting its critical role in India's industrial landscape.

The RBI survey (2023) also revealed that two-thirds of FTCs involved technology know-how or trademark use, with royalty payments being the most common mode of compensation. This finding aligns with Singh et al. (2022), who argued that the increasing reliance on royalty-based models underscores the shift towards more knowledge-intensive collaborations.

However, the literature also identifies challenges. Mishra and Jain (2023) highlighted that despite significant FTCs, their distribution remains concentrated in a few sectors, leaving others underserved. The underrepresentation of the

services sector, as reflected in the RBI survey, poses a challenge for broader economic growth.

The RBI survey findings, complemented by existing literature, underscore the strategic importance of foreign collaborations in driving sectoral growth and technology diffusion in India. This review provides a foundation for analyzing the 2021–2023 data, focusing on sectoral trends, partner countries, and the impact on production metrics.

METHODOLOGY

This study adopts a descriptive research design, utilizing secondary data from the Reserve Bank of India's (RBI) fourteenth biennial survey on foreign collaboration in Indian industry, covering the financial years 2021–2022 and 2022–2023. The methodology is structured to ensure a comprehensive understanding of foreign technical collaborations (FTCs) in India, focusing on sectoral distribution, source countries, collaboration types, and their impact on production growth.

1. **Data Source**: The primary source of data is the RBI's survey on FTCs, which analyzed 709 responses from Indian entities engaged in foreign collaborations. These responses include information on 674 FTC agreements signed during the study period. The survey provides detailed insights into the sectors involved, the origin of foreign partners, and the nature of technology and financial arrangements.
2. **Scope of Analysis**:
   - Sectoral Trends: The study categorizes FTCs based on the sectors they represent, such as manufacturing, services, and construction. It also provides further granularity within the manufacturing sector, examining key subsectors like machinery, transport equipment, and chemical products.
   - Source Countries: The study identifies the top countries involved in FTCs, analyzing trends in technology transfer and industrial collaboration with nations like Japan, the USA, and Germany.
   - Types of Collaborations: The study focuses on the nature of collaborations, distinguishing between technology know-how transfers, brand or trademark usage agreements, and turnkey project arrangements.
   - Financial Models: Payment modalities such as royalty payments, lump-sum fees, and equity stakes are evaluated to understand the financial dynamics of these collaborations.
   - Impact Assessment: The study compares production growth rates in sectors with significant FTC activity, using industry-level metrics to assess the contribution of FTCs to overall industrial performance.
3. **Analytical Approach:**
   - Quantitative Analysis: Data on the number and distribution of FTCs across sectors, countries, and collaboration types are analyzed using statistical methods to identify patterns and trends.

- Comparative Analysis: Production growth in sectors with substantial FTC involvement is compared against industry benchmarks to measure the impact of foreign collaborations.
- Descriptive Interpretation: The study employs descriptive statistics to highlight key insights and provides a narrative analysis to contextualize the findings.

4. **Limitations:**
   - Data Availability: The analysis relies on data reported by surveyed entities, which may not represent the entire population of FTCs in India.
   - Sectoral Focus: While manufacturing dominates the survey data, other sectors like services and construction are less represented, which may limit the generalizability of findings to all industries.
5. **Tools and Techniques**: The data were tabulated and analyzed using spreadsheet tools, with tables and graphs used to visualize key trends. Comparative metrics, such as growth percentages, were derived to assess performance.
6. **Ethical Considerations:** The study adheres to ethical research standards by ensuring proper attribution to the RBI survey and other cited literature. The use of secondary data complies with the terms and conditions stipulated by the RBI for public dissemination and research purposes.

By combining sectoral analysis, country-specific trends, and the financial modalities of collaborations, this methodology provides a robust framework for understanding the dynamics of foreign collaborations in Indian industry during 2021–2023

RESULT AND DISCUSSION

The analysis of the 2021–2023 RBI biennial survey on foreign technical collaborations (FTCs) provides a detailed view of the sectoral trends, source countries, nature of collaborations, and their impact on industrial production. The findings highlight the pivotal role of FTCs in India's industrial landscape, with the manufacturing sector continuing to dominate, while source countries like Japan, the USA, and Germany lead in technology transfer.

1. **Sectoral Distribution of FTCs**

   The manufacturing sector accounted for 78% of the total FTCs during 2021–2023, reaffirming its central role in foreign collaborations. Within manufacturing, the machinery, transport equipment, and chemical products subsectors were the largest beneficiaries, comprising over 40% of all FTCs. The services sector contributed 17%, with IT, telecommunications, and consulting being key areas of collaboration. Other sectors, such as construction, accounted for a smaller share (3%).

Table 1. Sectoral Distribution of FTCs (2021–2023).

Sector	Percentage of Total FTCs
Manufacturing	78%
Services	17%
Construction	3%
Others	2%

Source: Reserve Bank of India Survey on FTCs, 2023

Explanation:

The dominance of the manufacturing sector is indicative of India's ongoing efforts to position itself as a global manufacturing hub. The concentration in subsectors like machinery and transport equipment reflects the country's need for advanced technologies to meet industrial and infrastructural demands. The relatively low contribution from construction suggests untapped potential for FTCs in this area.

2. Leading Source Countries

Japan, the USA, and Germany emerged as the top three countries facilitating FTCs in India. Together, these countries accounted for a significant proportion of technology transfer agreements, with Japan leading in sectors like transport equipment and machinery. The USA contributed to collaborations in IT and advanced manufacturing, while Germany's presence was notable in chemical products and engineering solutions.

Table 2. Leading Source Countries for FTCs (2021–2023)

Country	Key Contribution Areas
Japan	Transport equipment, machinery
USA	IT, advanced manufacturing
Germany	Chemicals, engineering

Source: Reserve Bank of India Survey on FTCs, 2023

Explanation:

These countries' dominance highlights their expertise in high-value industries and their willingness to collaborate with Indian firms. The strategic partnerships with these nations reflect India's focus on acquiring sophisticated technologies to enhance productivity and competitiveness.

3. Nature of Collaborations

The survey found that over two-thirds of FTCs involved the transfer of technology know-how or the use of trademarks and brand names. Financial arrangements were predominantly royalty payments, which were used in more than 70% of agreements. Lump-sum fees and equity stakes were also common, though less prevalent.

Explanation:

The reliance on royalty-based models aligns with India's focus on leveraging intellectual property to boost domestic production capabilities. Technology know-how agreements are crucial for innovation and skill development in high-tech industries.

4. Impact on Production Growth

A key observation was the significant growth in production metrics for sectors heavily reliant on FTCs. The motor vehicles sector, which had notable foreign collaborations, recorded a 28.4% growth in production during 2022–2023, surpassing the overall production growth of all FTC-involved companies (24.3%).

Table 3. Production Growth in Motor Vehicles Sector VS All FTC Companies (2022–2023)

Category	**Production Growth (%)**
Motor Vehicles Sector	28.40%
All FTC Companies	24.30%

Source: Reserve Bank of India Survey on FTCs, 2023

Explanation:

The motor vehicles sector's growth underscores the tangible benefits of foreign collaborations, particularly in adopting cutting-edge technologies and enhancing production efficiency. The overall growth among FTC companies highlights the positive spillover effects of these partnerships on industrial performance.

CONCLUSIONS AND RECOMMENDATION

The analysis of foreign technical collaborations (FTCs) in Indian industry during 2021–2023 reveals their critical role in driving technological advancement and industrial growth. The manufacturing sector, accounting for 78% of FTCs, remains the cornerstone of these collaborations, with significant contributions from subsectors like machinery, transport equipment, and chemical products. Services and construction, though showing some activity, remain underrepresented, presenting opportunities for future growth.

Japan, the USA, and Germany emerged as the leading source countries for technology transfer, reflecting their strong technological ecosystems and India's strategic partnerships with these nations. The predominance of royalty-based financial models, utilized in over 70% of FTCs, underscores the focus on knowledge-driven agreements, enabling Indian firms to access advanced technologies and trademarks.

A notable highlight is the positive impact of FTCs on production growth, as exemplified by the motor vehicles sector, which achieved a remarkable 28.4% growth in production during 2022–2023, surpassing the overall growth of 24.3% across FTC-involved companies. This underscores the transformative potential of foreign collaborations in enhancing industrial efficiency, productivity, and global competitiveness.

However, the concentration of FTCs in specific sectors and countries signals the need for diversification. Policymakers and industry leaders must focus on underutilized sectors like construction and emerging technologies in services to maximize the benefits of FTCs. Strengthening partnerships with additional global players can further enhance India’s industrial landscape.

The findings from the RBI survey highlight the strategic importance of FTCs in achieving India's long-term goal of becoming a global manufacturing and technological hub. By addressing current gaps and fostering a more inclusive and diverse approach to foreign collaborations, India can accelerate its journey toward sustainable industrial growth.

REFERENCES

Aggarwal, A. (2021). Technology Transfer through FDI in India: Mode, Extent and Prospects. Transnational Corporations Review, 13(1), 1-15.

Basant, R., & Mani, S. (2022). Foreign R&D Centres in India: An Analysis of their Size, Structure and Implications. Journal of Industrial and Business Economics, 49(3), 321-340..

Chakraborty, C., & Nunnenkamp, P. (2022). Economic Reforms, FDI, and Economic Growth in India: A Sector Level Analysis. World Development, 152, 105792.

Gupta, R., Verma, P., & Sharma, S. (2022). Technology Transfer through Foreign Collaborations: Insights from Indian Industry. Journal of Industrial Studies, 45(2), 134–150.

Kumar, N., & Siddharthan, N. S. (2021). Technology Transfer, FDI and the Restructuring of R&D in Indian Industry. Economic and Political Weekly, 56(5), 45-53.

Madrewar, S. S., Dhinwa, S., Pawar, M. S., Das, D., & Raut, P. R. (2024). Enhancing agricultural market transparency in India: The role of IoT technology. International Journal of Integrative Research (IJIR), 2(9), 761-774. https://doi.org/10.59890/ddq0q431E

Madrewar, S. S., Dhinwa, S., Sah, S., Bhosale, V. S., & Gumphekar, A. M. (2024). Evaluating climate-smart agriculture: Effects on productivity, sustainability, and farmer resilience in India. International Journal of Integrative Research (IJIR), 2(9), 741-760. https://doi.org/10.59890/z3net383E

Madrewar, S. S., Dhinwa, S., Khadkikar, N. R., Shaikh, S. P., Bhoite, A. V., & Shinde, S. B. (2024). The impact of zero carbon emission farming on sustainable agricultural development in India: Challenges and opportunities. International Journal of Applied and Advanced Multidisciplinary Research (IJAAMR), 2(7), 555-568. https://doi.org/10.59890/ijaamr.v2i7.2420

Madrewar, S. S., Khadkikar, N. R., Suryawanshi, O. V., Mulani, J. S., & Sagar, A. R. (2024). Digital agriculture: Impact of IoT and AI on Indian agribusiness. International Journal of Applied Economics, Accounting and Management (IJAEAM), 2(4), 327-350. https://doi.org/10.59890/ijaeam.v2i4.2346

Madrewar, S. S., Khadkikar, N. R., Katkar, R. C., Suryawanshi, O. V., & Kapare, S. S. (2024). Climate change and the future of Indian organic agriculture in international trade. International Journal of Applied Economics, Accounting and Management (IJAEAM), 2(4), 309-326. https://doi.org/10.59890/ijaeam.v2i4.2331

Madrewar, S. S., Dhinwa, S., Gumphekar, A. M., Tavhare, P. B., Suryawanshi, O. V., & Sagar, A. R. (2024). Revolution for digitalization of agriculture in

India: A comprehensive study. International Journal of Global Sustainable Research (IJGSR), 2(7), 395-414. https://doi.org/10.59890/ijgsr.v2i7.2521

Madrewar, S. S., Shrishty, A., Sathe, S. N., Tavhare, P. B., Suryawanshi, O. V., & Kulkarni, B. B. (2024). Climate change and Indian grapes: Analyzing the economic impact on export-dependent agriculture (2022-2023). International Journal of Applied Economics, Accounting and Management (IJAEAM), 2(4), 295-306. https://doi.org/10.59890/ijaeam.v2i4.2324

Mishra, P., & Jain, A. (2023). Sectoral Disparities in Foreign Collaborations in India: Challenges and Opportunities. Economic Perspectives, 67(4), 211–225.

Narayanan, K., & Bhat, S. (2021). Impact of Foreign Direct Investment on Innovation in Indian Manufacturing Firms: An Empirical Analysis. Innovation and Development, 11(2-3), 215-233.

Patnaik, I., & Shah, A. (2021). FDI and Productivity: Evidence from Indian Manufacturing. Journal of Asian Economics, 73, 101257.

Reserve Bank of India. (2023). Survey on Foreign Collaboration in Indian Industry: 2021–2023. Retrieved from https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=56660.

Sahu, P., & Solarin, S. A. (2022). The Impact of Foreign Direct Investment on Industrial Productivity in India: Evidence from Cointegration and Causality Analysis. Economic Change and Restructuring, 55(2), 123-145.

Sharma, A., & Kumar, D. (2021). Role of Foreign Collaborations in India's Manufacturing Growth. Indian Economic Review, 56(3), 89–110.

Singh, K., & Bhardwaj, N. (2022). Royalty-Based Technology Transfer Models in Indian Industries. Journal of Business and Economics, 28(1), 76–94.

Singh, L., & Ghosh, S. (2022). Determinants of Technology Transfer in Indian Manufacturing Industries: The Role of FDI and Trade. Asian Journal of Technology Innovation, 30(1), 67-88.