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**298**

WORKING PAPER

**Macro-economic Impact of Adoption  
of New Technologies on Indian Economy:  
An Analysis Using CGE Modelling Framework**

**Akhilesh Kumar Sharma**

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**March 2025**

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**ISID** **Institute for Studies in Industrial Development**  
An institution of Indian Council of Social Science Research (Ministry of Education)

4 Vasant Kunj Institutional Area, New Delhi - 110 070

*Phone:* +91 11 3510 4511 | *E-mail:* info@isid.org.in | *Website:* <https://isid.org.in>

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# Macro-economic Impact of Adoption of New Technologies on Indian Economy: An Analysis Using CGE Modelling Framework

*Akhilesh Kumar Sharma\**

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*Abstract: Industry 4.0 technologies are rapidly evolving during the fourth industrial revolution. Adoption of these technologies are changing industrial landscape rapidly. Studies suggest that it has significant positive impact on the productivity across sectors and overall economy. Sectors have both forward and backward linkages. Even the productivity change in one sector may have impact on the performance of other sectors also. The present study aims to understand the possible impact on macro-economic indicators such as output, GVA, employment, trade, revenue, household income among others macro-economic impact with the adoption of new technologies across sectors. The study has used the PEP CGE Model for simulation exercises. A 68-sector SAM for India for the year 2017-18 has used as its basic database. For our analysis, sector specific productivity shocks have been introduced for simulations. The results of impact assessment of adoption of new technologies using CGE modelling are promising, showing that the adoption of new technologies has a significantly positive impact on GDP, real GDP, output, exports, imports, government revenue, and household income, while contributing to lower price inflation. The effect on output varies across sectors due to differences in productivity shocks and the income elasticity of various products and services. Interestingly, the employment effect is neutral (zero) in the case of productivity shocks alone, while it aligns with the labour force growth rate in the scenario combining productivity and labour supply shocks. This indicates that adopting new technologies will not negatively impact employment in the economy. Additionally, the income effect is higher for rural households compared to urban households. Within both rural and urban categories, the lower quintile classes experience a greater positive income effect than the higher-income classes. These findings suggest that new technologies have the potential to promote inclusive growth within the economy.*

*Keywords: Industrial Transformation, New Technologies, India, CGE Modelling*

*JEL Classification: O14, N15, C68*

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\* Akhilesh Kumar Sharma, Assistant Professor, Institute for Studies in Industrial Development (ISID), New Delhi. Email: [akhilesh@isid.org.in](mailto:akhilesh@isid.org.in)

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*For the complete working paper, please contact the author at [akhilesh@isid.org.in](mailto:akhilesh@isid.org.in)*

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4 Vasant Kunj Institutional Area, New Delhi - 110070, India

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