



## The role of innovation and technology upgrading on industrial and export competitiveness in Tanzania

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### Key Messages

Tanzania has performed relatively well in the recent Global Innovation Index compared to the comparable low-income countries in Africa.

However, Tanzania's merchandise exports continue to be dominated with low tech products, mainly resource-based (mining/gold), whilst high tech products are dominant in the imports

Notably, the capacity and prospects for future investment in innovation and technology upgrading appears limited to large scale and foreign owned firms.

### Introduction

This policy brief presents a summary of key findings and recommendations from the REPOA study on the role of Innovation and Technology Upgrading (herein after, ITU) on competitiveness of Tanzania's industrial and export sectors. To achieve its objective, the study was structured into three complementary components. The first component set the stage by conducting a situational analysis, where we assessed the current status and trends in technology and innovation profile among the Tanzanian manufacturing industrial sectors. Given the dearth of empirical evidence to support policy dialogue on ITU agenda in Tanzania, the second component focused on the empirical analysis, using the existing Annual Survey of Industrial Production (ASIP) data to identify drivers of innovation and technology upgrading at firm level and examined its impact on firms' competitiveness. Finally, to shed light on how firms can practically leverage innovation and technology upgrading, the third and final component presented a case study analysis based on the practical experiences of a few selected firms in order to identify and profile success factors and cases where ITU has led to dramatic improvement on firms' performance and competitiveness. The case study approach is justified in that it addressed the limitations of the ASIP data, which does not provide detailed information on the firms' ITUs experience, challenges and prospects.

Key highlights on the study findings are summarized below and organized in terms of the key policy research questions.

### Key study findings



*What is the current status and profile of innovation and technology upgrading in Tanzania's Industrial manufacturing sector?*

Using different indices mainly the Global Innovation Index, Trade performance and Survey based indicators, the study findings show that:

- Tanzania has performed relatively well in Global Innovation Index ranking in innovation output compared to the comparable low-income countries in Africa. Tanzania was ranked 88th on the index for 2020 thus topping the low-income group in that year.
- However, Tanzania merchandise exports continue to be dominated with low tech products, mainly resource-based (mining/gold), while high tech products are dominant in the imports. Nonetheless, consistent with the overall improvement in innovation performance, the structure of exports has been changing in favour of increased share of higher technology products in total merchandise exports.
- Notably, the majority Low Technology (LT) sectors accounts for 75% of total industrial manufacturing firms, while the rest (25%) are the Medium and High Technology.
- Nonetheless, more innovation effort/input is observed more prevalently among the Medium and High Technology firms than in the LT firms, which is not surprising as majority of the LT firms are SMEs with limited capacity to undertake (invest in) innovation activities.



*Is empirical evidence in favour of the policy objective of promoting the role and impact of ITU on firms' competitiveness? What are the main drivers of ITU and how does ITU impact on firms' competitiveness?*

Based on the firm level ASIP database, the study estimates the determinants of ITU and subsequently examines its impact on firms' competitiveness. The results show that:

- Investment in innovation has positive impact on firms' productivity, and that the likelihood of firms spending on innovation is positively related to age (older firms are more likely to spend on innovation compared with younger firms), participation in international trade, foreign ownership and size (smaller firms are less likely to spend on innovation compared to larger firms, reflecting capacity constraints issues).
- The public innovation and technology partnerships/ programmes have a positive impact in promoting innovation and technology upgrading for industrial/export competitiveness, especially for SMEs.
- However, firms receiving government subsidies are 43% less likely to spend on innovation than otherwise, reflecting potential adverse effects of subsidies on crowding out private investment
- On the ITU drivers, the study findings show that firms are more likely to invest in innovation or produce innovation output if they participate in international trade or are member of industry associations and face a more competitive environment. This indicates that, firms' exposure to external environment is critical for enhancing
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*What is the actual experience of firms in leveraging the role of ITU to spur higher levels of competitiveness and productivity? What are the key lessons that can be replicated across the industrial and other sectors in Tanzania?*

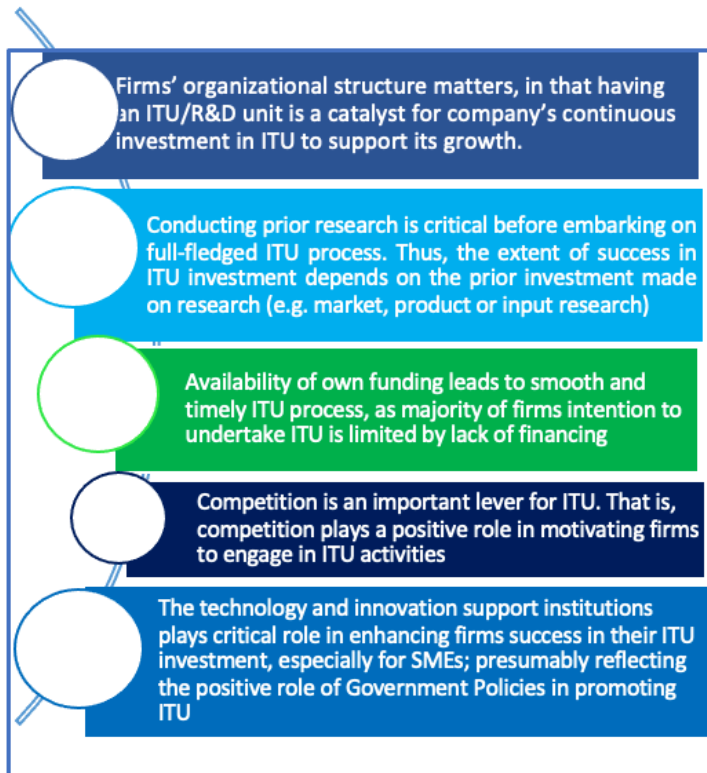
Owing to the limitations of the existing ASIP survey data, the study used a case study approach to provide detailed information on the firms' ITUs experience, challenges and prospects. The report discussed firms' ITU experience in terms of description of the nature, drivers and impact of the ITU undertaken by different firms and highlighted the emerging challenges and lessons. The individual firms' experiences are detailed in the report, but the overall salient features and key findings show that:

- ITU is largely customized and localized process in that there is no one size fits all. Nonetheless, although firms have quite a wide variation in their investment and experience on ITU, some common features/factors determine the extent, nature and the ultimate impact. These include the fact that, all firms are driven by competition for bigger market through productivity and quality improvement.
- Although the level of ITU appears largely basic and reliant on technology transfer (adaptation) from imports/external Partnerships, it has significant impact on firms' competitiveness. Despite unavailability of reliable and quantifiable data to illustrate the impact, the interviewed firms consistently confirmed that the ITU undertaken or its process led to significant impact on firms' performance. This is because most of the ITU targeted at attaining bigger markets, improving quality and responding to market opportunities from particular challenges.
- To ensure firm's success, the process is as important as the ultimate ITU results. The ITU process underscores the need for careful prior planning and having a predetermined process/guidance for conducting ITU. The firms highlighted different challenges that they faced in the process including lack of required finance, supportive government policies, and expertise, among others. Furthermore, the process for ITU underscores the importance of research and technology transfer in reaching the ultimate results.

The policy and institutional framework while critical in achieving impactful ITU, the firms experience and testimonials lend little if any evidence on its role in enhancing ITU at the firm level, perhaps implying the need for a further research.

## Key lessons from study findings

Based on firm experience with ITU, we identified some useful lessons that could inform how firms can successfully leverage ITU and provide inputs in policy reviews/dialogue or formulation of more effective policies, strategies or programmes. These are briefly outlined as follows:



## Conclusions and Policy Recommendations

From the foregoing, the study makes the following conclusions with implications for policy:

- Although the trends in the level of innovation and technology upgrading have been increasing favorably (albeit from a very low base) for Tanzania over the last couple of years, efforts by firms and the Government to leverage such trends to support the country's much needed competitiveness is limited. Despite the small structural change, the country production and export basket is dominated by low tech sectors (mainly SMEs) and resource based goods/commodities.
- Notably, the capacity and prospects for future investment in innovation and technology upgrading appears limited to large scale and foreign owned firms. This implies that the majority of firms are left out, given the dominant share of SMEs. This implies the need for the Government to invest further in technology partnerships programmes to support SMEs, promote technology and skills transfer by, among other mechanisms, promoting linkage between large/foreign and small/domestic firms, especially in the Special Economic Zones (SEZs).

- The case study identified main success factors for firms to achieve the benefits of ITU investment. These include the critical importance of having an ITU/R&D unit, conducting prior research before embarking on full-fledged ITU process, having adequate financing especially from the internal funds, embracing competition; and Government support by improving the policy and regulatory environment, and strengthening technology and innovation support institutions (e.g. SIDO, CARMATEC, TIRDO etc.)

Following these findings, the following recommendations are for consideration:

- Review the policy and institutional framework for promoting ITU to fill gaps and to update/strengthen the role of Government/Public institutions.
- Address the identified challenges limiting firms ITU. The most pressing of these challenges include weak intellectual property rights that mitigate risks of unauthorized copying or imitation of other firms' innovation or invention; unreliable supply of power; weak enforcement of customs procedures and trade policy instrument for protecting local producers; and financing challenges, among others.
- Strengthen existing institutions for promoting ITU including action to ensure adequate funding, sensitize/raise awareness on their respective role in supporting firms in their ITU endeavors. These institutions include R&D institutions such as TIRDO and Academic entities; technology institutions such as CARMATEC, SIDO, COSTECH etc. and Industrial Promoters (e.g., EPZA, TIC, NDC etc.)

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