

The Creation of Policy Options of Science, Technology and Innovation Policy

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The 21st century marks the prosperity of internet of things (IoT) in cyber physical systems with the stream of technology change that drastically reshaped the social economy structure. The study aims to develop a recursive dynamic model of science technology and innovation policy for analyzing social economic impact and assessment on the science for policies. By reviewing the economic impact through examining several alternative policy options on the manufacturing sectors with IoT implementation for its information allocation and processioning to accelerate its productivity. The data used in the model were sourced from Japan's input-output table with expansion of the tangible and non-tangible capital investment by considering long/short run block, labor market modeling, value-added and wage determinant, government balance sheet, foreign and the final demand block.

The study interpreted interconnection of exogenous technology scenarios in comparison with the policy options with the baseline of business as usual (BAU) to derive the impact in the general interdependency of economy constituted the multi-sectoral general equilibrium economic model. The model expected to shed lights on implication of total factor productivity (TFP) for its process change on the demand side while the productivity improvement in information provision service sector that enlarges the platform business, assisting manufacturing sectors to create new market and variate the international production networking structure. Such business platform is indispensable for utilizing the cross-sectoral information technology whereas these fundamental factors based on information and system technology of robotic artificial intelligence will construct a new relationship of human kind and machine. The study demonstrating policy options by introducing different level of the processing efficiency index (P-index) in the activity divisions of marketing, planning, R&D, procurement, operation and sales, conservative, the deviations of economic variables in production process were examined.

The simulation results showed the change on employment and production division along with the IoT and ICT advancement of its short/long-run effect. For manufacturing sector, the efficiency improvement would increase the production, public, private R&D investment and consolidate the knowledge stock for the expansion of knowledge infrastructure that rose TFP. Also, the information management could benefit from outsourcing and externalization while the cross-sectional platform of information management may thus be established. Finally, the human resource and higher level professional education revealed an increase especially in information related, service and R&D division in private sector. The industrial evolution would increase the gap of knowledge that causes technological unemployment remains a concern, the analytical framework in the study is expected to provide evidence-based approach to tackle the critical issue.