



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2019; 5(10): 31-34
www.allresearchjournal.com
Received: 16-08-2019
Accepted: 18-09-2019

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Technology and Total Factor Productivity (TFP) policy recommendations for economic growth in developing world

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Abstract

In this paper discusses technological policy recommendations for economic growth in developing countries. For that this study introduces “Policy recommendations”. It includes new exogenous growth recommendations and especially discuss recommendations for increasing TFP (Total Factor Productivity), Production Analysis recommendations, Macroeconomic recommendation and government policy recommendations, Technological policy recommendations and the new paradigms of technological policies. Moreover, this paper suggested some new research paradigms for the benefit of future researchers. This recommendations effect to increase the income level of households, job opportunities, and rises the aggregate productivity in the economy. In addition, productivity growth results in cost reduction of the key production in the economy, increasing the household purchasing power of poor employees and in helping the poor households to experience a better lifestyle in the society. In conclusion of this paper illustrates, global economic productivity growth reduces the poverty in the developing world, therefore the world must systematically work together in these policies in future.

Keywords: TFP, production, technology, research

Introduction

Introduction of Policy recommendation for TFP

Ana Paula and William F. Maloney (2018) ^[3] published a very interesting world bank project book called “Productivity Revisited” in which they suggested several TFP policy actions. We explain our TFP policy recommendations and suggestions according to them.

“Productivity isn’t everything but, in the long run, it is almost everything” (Kruhman 1994). Because of that, productivity is critical not only to the growth of economy but also to the increment of long-run earnings of the citizens, employability of the society, quality of lifestyle, household purchasing power, efficiency and efficacy of the services, and quality of the market. More importantly, it reduces poverty in the economy. Thus, it is noteworthy to examine what policy makers can do to the growth of the productivity engine.

Solow (1987) noted that the fundamental fuel of economic growth is based on the growth of TFP and technological progress. For this he requested increasing the investment and capital stock (both human and physical) in the economy. But today’s policy is much advanced than Solow’s explanations and the current policy makers consider that the best fuel of economic growth (TFP) depends on the knowledge and innovations. (Bloom 2017, Robert Gordon 2015, 2017). Because of that, Solow did not explain the information technology, communication technology, web related products, and knowledge theory in his theory, (Syverson, 2016, 2017). Therefore, these new policies must communicate the technological knowledge to production process.

To remediate this we recommend the following,

Education policy must be changed the and it must decline the economic dynamism in the economy. Thus, it must generate job reallocations, firm ^[1] turnover, and entrepreneurial activity in growth mechanism.

- Global financial crisis financially affected many firms in the world, especially developing countries as they depend more on outside finances. Therefore, these crises

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cause troubles in the productivity of these economies. As a result, the world is in need of financial discipline as well as financial policies that encourage investment in the developing countries while ensuring the increment and restructuring of investments in innovation. Productivity growth has been driven strongly by innovations in the past years.

- Advanced economies have a responsibility to improve the global productivity. Therefore, these actions move the growth of the industrial and service sectors in the world. As a result, developing countries follow the advanced countries and improve their economies to reduce poverty.
- Improve the labor markets in developed countries and promote new works of productivity.

Restuccia (2013) explained that an advanced economy takes just over nine days to produce what the average person in the lowest income countries produce in an entire year. Therefore, Pritchett (1997) illustrated the importance of improving the global productivity in order to be up to date with new technological achievement not only in the advanced economies but also in the developing economies. Because of that, these advanced economic activities generate a vast amount of ideas, technologies, products, and positive externalities for the developing countries (Comin 2018, Mestieri 2018). For this, advanced economies must be able to identify production issues and to distinguish potential advantages and disadvantages in policy pigmentations. Then they can make more effective policy reforms for the world. Therefore, advanced economies facilitate a quality Production Analysis to identify this potential. In the next subsection we explain the Production Analysis methods and recommendations for the policy world.

Production Analysis recommendations

Production analysis and production data offer a vast production knowledge and dimensions for the policy world. Firstly, these measurements have access to detailed higher quality firms' data. Such data has the potential to improve the economy. Secondly, this data generates academic literature and knowledge. This knowledge is an identifier of the production growth path and a guide to attain the desired economic growth. Thirdly, this knowledge generates quantification of human capital or capital capabilities in the economy. Therefore, production analyses are an essential task in today's firms. According to the above conditions, we suggest several proactive production policy areas, and, in this subsection, we explain the analyzed policy recommendations in detail.

We can identify the following using this analysis and evaluation of the productivity (TFP) for the policy designs;

- Production behavior and database, efficiency of the productivity, understand the market failures, policy reform activity, prices level of industry and firm level price effect, firm inputs cost, production quality and market power make policy changes as much as efficiency.
- Effective structural changes in the market: for example, Chile and India use these techniques to change their policies for the growth of productivity. (De Loecker 2017).

- These analyses show a reliable direction of the economy, effective factor allocation between firm and sectors, significant technological dimensions, investment risk, cost adjustment in firm, etc. US economy use this TFP analyses for their significant GDP growth today.
- The government must guide the firms to govern human capital in order to develop its skills, to analyze employability performance, and to encourage capital development projects.

Productivity policy recommendations for TFP growth

Productivity policy needs to force the main three components in the TFP growth. Those are, (1). Reallocation of the production resources from low productivity firms to higher productivity firms. (2) Increasing the productivity using the technological adoptions and innovations. (3). Governing employability and using better managerial skills inside the firms. We recommend the following for the success of TFP growth:

- Firms can reduce the trade barriers and poor regulations,
- Firms can discover new innovations and collaborate with the innovative firms.
- Firms can introduce new products and process (environment friendly productions), new marketing programs, etc.

Productivity policy recommendations for operation environment, human capital, and firm capability: for this we recommend the following,

1 In the operation environment

- Confirm the work competition policy inside the firm
- Reduce the distortion in working environment
- Transfer the resources and facilities to the working environment
- Collaborating with innovative firms
- Operation environment must be depended on the market conditions and competitors of the market

In human capital

It is advisable that the government follows the recommendations of the World Bank Human Capital Project (2018) for human capital development. These recommendations include,

- Reducing the technological gap in the economies /firms
- Collaborating with international technological skill development programs
- Transferring the resources and facilities
- Evaluating the performance and risks in the human capital investment
- Promoting Innovative education policies

Macroeconomic recommendation and government policy

Macroeconomic recommendation for TFP growth

- Expanding demand: we can use stranded macroeconomic policies accordingly.
- Clearing the market power and protecting the competition of the market
- Reducing the uncertainty in the market

Government

- Government's key role is maintaining and improving the National Productive System. For this, the government can increase the infrastructure of the economy, innovative productivity, and the quality of the education system. Moreover, the government can maintain and govern the National Accounting system (NAS) and deliver the information for the production industry using social Organizations.
- Government needs to use policies to control market failures. For this, the government can use R&D projects and Information policies to communicate the information to society.

Such policies improve the TFP of the economy while generating positive externalities and benefits for the production industry. In the next section we recommend some policy actions for the technological policy

Technological policy recommendations

Government needs to involve the R&D policy in the economy. For this, the government can,

- Reduce government spending and directly transfer these savings to small research firms and tax relief.
- Motivate small business research, invest money on new technologies and increase the size and the finances of the projects.
- Identify and abandon the ineffective, expensive projects and transfer that saving to effective projects. The government can use fiscal studies to identify the ineffective projects. This policy is practically used in the UK.
- Review and audit the firm's progress of a project and spend money on innovation research.
- Create Enterprise zones and give the tax advantages for the innovative projects
- Transfer this return of investment for the society; also, these returns must make significant public supports in an economy.
- Require more transparency in funding decisions and clearer auditing of performance so that failing performance areas are cut off.
- Motivate environment- friendly, green technological investment in the economy

Concluding the production and technological policy recommendations, it is highlighted that the government plays a massive role in the economy. Therefore, all governments in the world should strongly abide by these responsibilities, because not only their own economic success but also the world's economic future depend on these policies. In next and final section, we explain the academic recommendations related to this work.

Academic recommendations

Firstly, this study found a very strong relationship between technological policy with R&D and Asymmetric information. This relationship is very strong and very significant for the policy world because it will make a number of new policy instruments and ideas for the future world. Therefore, I highly recommend future researchers to further investigate this field as this topic generates much significant outcomes for the world. Secondly, there was no theoretical explanation in the exogenous growth model that

describes the relationship between human capital and technology. NP model explains this. But NP model is a more advanced model in the academic world. We cannot explain all theoretical implications and empirical conditions in the world in a single section. If a researcher is interested in explaining this relationship using their own data, I hope this research will make a significant contribution. Thus, I would like to recommend this topic for further studies for in future academic world.

Conclusion

In conclusion, productivity is critical not only in economic growth but also significant in lifestyles in all citizens in the economy because it generates a number of long-run benefits for the world. It improves employability and offers a better lifestyle for the poor employers in the economy. Moreover, it increases the income level of households, job opportunities, and finally, rises the aggregate productivity in the economy. In addition, productivity growth results in cost reduction of the key production in the economy. This causes mainly in increasing the household purchasing power of poor employees and in helping the poor households to experience a better lifestyle in the society. Moreover, technological development reduces the cost of production and improves the efficiency in the economy. This technological development depends on the quality of knowledge in the world and this knowledge is generated by the quality R&D and education fields. All the exogenous productivity or (TFP) and technological policy actions affect the rising global economic productivity growth. Finally, global economic productivity growth reduces the poverty in the world, therefore the world must systematically work together in these policies in future.

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