



Proposals for Technological up-gradation and revolution in Pakistan, based on local resources for rapid economic growth

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Introduction

Pakistan is a homeland of over 160 Million people.

Since its independence in 1947, it had been through many problems, but the recent most tide of geo-political and economic problems both at external and internal fronts is perhaps unprecedented. Some of these problems are:

- **Electricity Shortage,**
- **Adverse Security Situation (Both at external and Internal Fronts)**
- **Low Productivity,**
- **High Prices and Inflation,**
- **Unemployment of Educated,**
- **Poverty and Inequality,**

People and government of Pakistan are trying to face the challenges and work out viable strategies for solutions of all such problems.

Introduction....contd...

- It is in this perspective of challenging environment, that the present paper sheds light on the need to develop a model for Pakistan's economic growth based on local resources through technological up-gradation.
- However, the basic idea remains that development of domestic resources and technological up-gradation cannot be and should not be done in isolation from the rest of the world.
- Pakistan does and should avail the technological knowledge and machinery produced abroad, but now it is time to develop the technological capabilities of firms in Pakistan so that we can perform in the best possible manner.

Scheme of the Paper

This conference paper would build upon following core issues;

- 1. Role of technology in the economic growth and development,**
- 2. Situation of Pakistan's industrial sector and its dependence on imported machinery,**
- 3. Issue of Technological up-gradation and its context in Pakistan,**
- 4. Technology in Pakistan: Industry-Academia-Government - The Missing Linkages.**
- 5. Proposals, Strategy and Policy Options.**

Role of Technology in the Economic Growth and Development: Some General Principles

- In the modern knowledge based economy, technology has been placed as a very strategic input in the process of economic growth and development through the production of high value added goods.**
- There are several examples of rapid economic development based on technological up-gradation. The biggest example is that of Newly Industrializing Economies (NIEs) like Korea, Taiwan, Singapore, Hong Kong, and now China, and possibly India.**
- The ultimate objectives of rapid economic growth and self reliance call for a proactive drive for bringing about a technological revolution in Pakistan.**

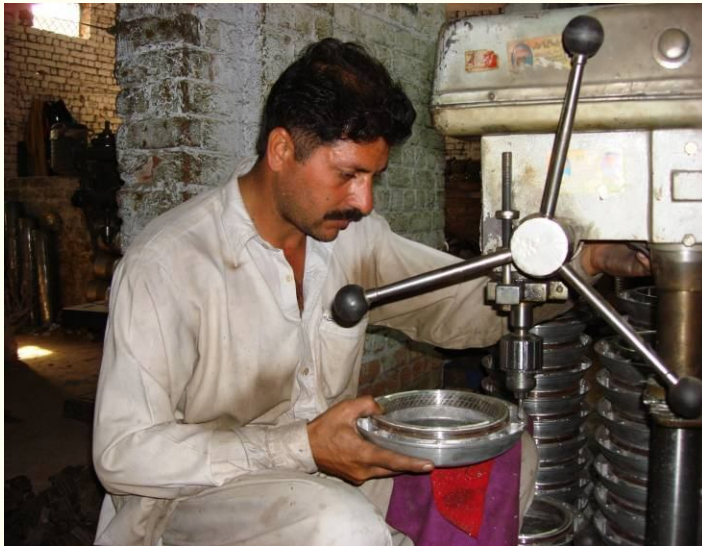
Role of Technology in the Economic Growth and Development: Evidence from China and South Korea

- **South Korea and China, among others, come up as role models for successful rapid technological development...**
- **The key features of both the economies include:**
 - **High levels of educational attainment,**
 - **High levels of saving and investment,**
 - **Export Orientation,**
 - **Technological Development Policy Initiatives and continuous improvement,**
 - **Sensible and consistent governmental policies,**
 - **Drive for innovation and competitiveness.**
- **The most important point to be noted is that there is complementarities among policies, e.g. Human Resource Development, Financial Development, Technological Development, Industrial and Engineering Development are aligned.**

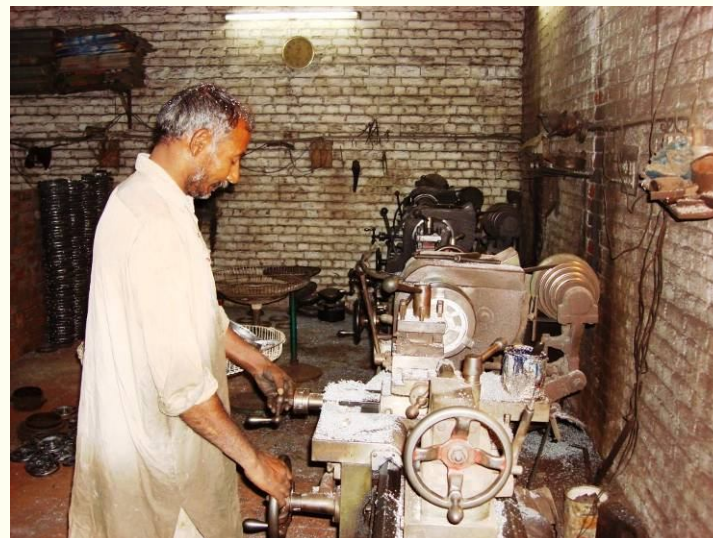
Situation of Pakistan's Industrial Sector and its Dependence on Imported inputs

- The Industrial sector of Pakistan comprises of very sophisticated and technologically well-equipped firms usually operating in the large scale manufacturing, and numerous Small and medium sized enterprises operating with the informal or semi-formal low technology manufacturing processes.
- Secondly, the industrial sector depends upon imported inputs like machinery, raw materials, chemicals etc. According to the Economic Survey 2008-09, around 64% of our total imports are in the machinery group (14.8%), petroleum group (27.7%), and raw materials (20.9%).
- Thirdly, the incentives and policy initiatives are usually for export oriented firms which has implications for a large majority of enterprises in Pakistan.

Issues of Technological up-gradation and its context in Pakistan



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Some observations from fan industry of Pakistan

“Dynamics of Fan Industry in Pakistan” was published in 2010. This report explores the various dimensions of growth dynamics of small, medium and large size firms in the electric fan industry of Pakistan. The fan industry landscape is, as typical of a developing economy, full of inter-firm resource heterogeneity and ‘technological dualism’, where larger, and some medium scale enterprises use more modern methods of production and business, and the small scale firms rely upon the traditional processes. Based on the information and data gathered through field surveys, this research has attempted to formally analyse the pattern and determinants of the performance of fan making firms.

The information and data comprised of various dimension of entrepreneurial competencies, business operations, skill sets, technological capabilities, as well as input-out dynamics.

Some observations from fan industry of Pakistan --- (contd)

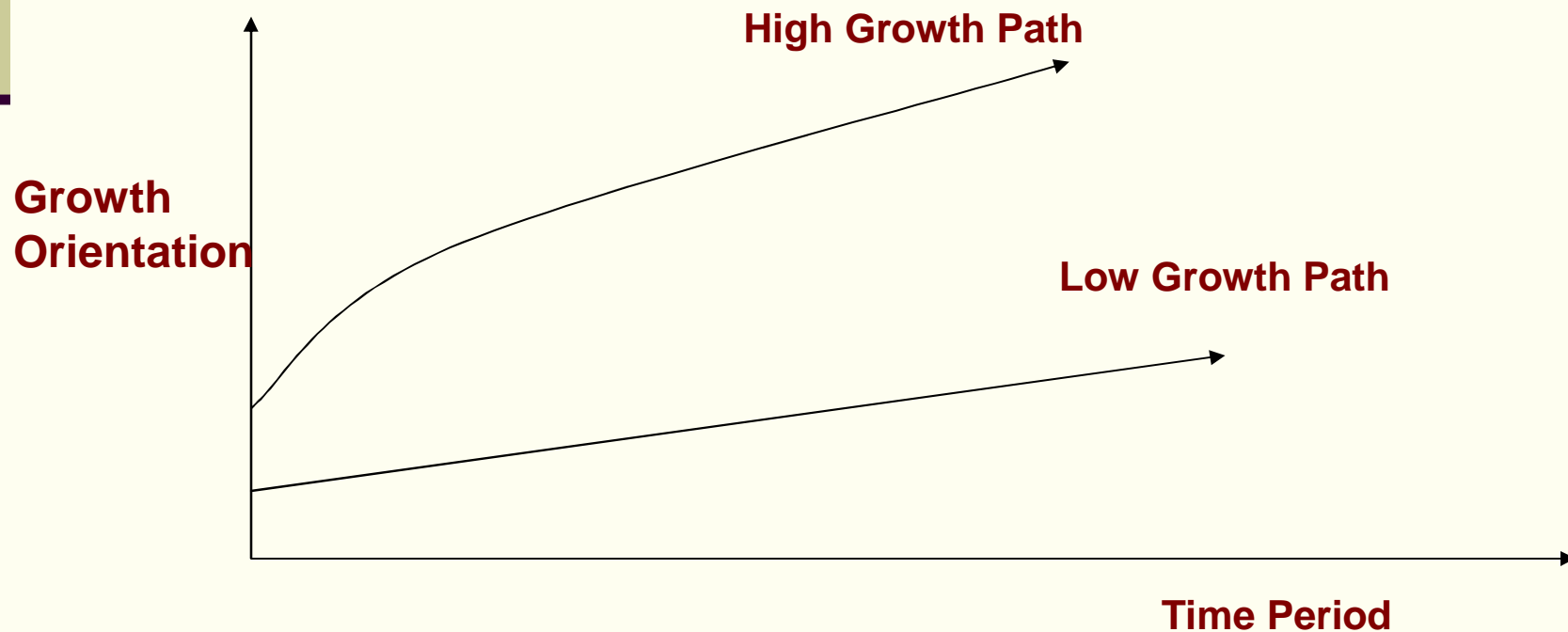
Starting from the development of industry specific classifications of firm sizes, based on number of workers, output range, number and types of machines, the research has analyzed various issues related with firm performance across and within firms of different sizes. Other characteristics of firms like targeted income groups, types of markets (local and/or international), outsourcing practices, product diversification, R&D practices, product testing, nature and sources of skills acquisition, technological up-gradation over time and advertisement practices have also been used for deeper and broader evaluation of industry and firm-size specific dynamics. This research has contributed to literature in terms of its industry specific findings, and also by developing an estimate of growth orientation of different sized firms and its determinants. A low-growth oriented firm is characterized by fewer intentions and actions to expand vis-à-vis a more growth oriented firm.

Dynamics of Growth Orientation of Firms in Fan Industry

- **Growth orientation relates to the plan of a firm to grow in terms of production and/or turnover.**
- For analyzing the dynamics of growth orientation of firms operating in the fan industry, **firms have been categorized as high-growth and low-growth oriented.**
- To determine the **level of growth orientation**, variables namely;
 - i-** Entrepreneurial intentions to expand,
 - ii-** Plans to increase number of machines and their level of sophistication,
 - iii-** Current methods of production and their level of sophistication,
 - iv-** In-house research and development activities,
 - v-** The kind and purpose of certifications held by the firms.

Distribution of Sample Firms on the Basis of Growth Orientation

High-Growth Oriented Firms	Low-Growth Oriented Firms	Total Sample Firms
42.5 %	57.5 %	100 %



Salient Features of High Growth Oriented Firms in the Sample

- **Relatively More Entrepreneurial**
- **Focus on Product and Process Quality (by implication better quality raw materials)**
- **Focus on Urban Areas and International Markets**
- **Sophisticated, and Relatively Modern Machinery**
- **Intentions for Technological Up-gradation**
- **Preference for Skill Development**
- **Research and Development Activities**
- **Variety, Design, and Product Diversification**
- **Quality Certifications (specially for international markets)**
- **Positive Future Outlook**
- **Focus on increasing sales and advertisements**

Salient Features of Low Growth Oriented Firms in the Sample

- Relatively Less Entrepreneurial**
- Lesser Focus on Product and Process Quality**
- Focus on Sub-urban Areas**
- Relatively Traditional Machinery**
- Lesser or No Intentions for Technological Up-gradation**
- Lesser Preference for Skill Development**
- No Research and Development Activities**
- No or Less Degree of Quality Certifications**
- Focus on Maintaining Sales**
- Lesser Skilled Labour (as compared to High Growth Oriented Firm)**

Technology in Pakistan: Industry-Academia-Government - The Missing Linkages

The efforts for bringing about a technological revolution should be done by

- Fostering the *knowledge sharing* through institutional set-up.
- The Industry-Academia-Government linkages can actually be very helpful in this regard.

There are projects going on in the country in this context. However, again the issue remains to effectively and efficiently manage the projects and their continuous improvement. That is the only way to develop the technological capability and its commercialization.

Main Conclusions

- Technological up-gradation is not an end in itself, but a means for rapid economic growth which in turn should lead us to better living standards for all.
- Technological development should be achieved in such a manner that the local academic and research institutions work in close collaborations with industry.
- Governments, both at federal and provincial levels, should take up the responsibility to facilitate the development of such collaborations. This is a key to the knowledge generation and technology development that would be locally relevant.

Main Conclusions...

- Research shows that the technological up-gradation requirements of the firms and industry are not uniform. They are different even within one sector and vary because of firm's size, location, and value creation.
- A technological up-gradation policy can only succeed and bring fruits if it responds to local demands in a global scenario. Linking the firms to global value chain, through technological up-gradation is the need of the hour.
- Technological up-gradation and skill development goes hand in hand. Its not only machine that matters, man matters the most. So, our education and training institutions should also be up-graded in terms of what do they teach and how.



Thank You

For your time and attention