

## Overview

**Rashid Amjad\***

### 1. Introduction

Since the early 1990s, Pakistan's economy has continued to lose its earlier growth momentum, except for a brief spurt in 2002–06. This has now become cause for considerable concern and urgent policy action is needed to revive the economy and move it to a higher growth trajectory. This slowdown during a period of rapid globalization (at least till 2008) and unprecedented technological advancement has raised fundamental questions as to the growing lack of competitiveness, both at the global level as well as against cheaper and better-quality imports in the domestic economy. In addition, recurring balance-of-payments crises have forced Pakistan to frequently seek IMF assistance and resort to severe contractionary policies to restore macroeconomic stability.

To address these issues, the Lahore School of Economics held its 12th international conference on the Management of the Pakistan Economy on the theme "Technology, entrepreneurship and productivity growth: Where Pakistan stands and where it must go." An important feature of this conference was that it brought together leading scientists, economists, industry-level specialists, business leaders and policymakers both from within Pakistan and abroad to debate the direction the economy must take to break out of its current impasse.

This overview presents the main findings and policy messages that emerged from the conference, as contained in the papers in this volume as well as from the presentations, discussion and debates that followed. It is divided, as the conference so ably did, into macro-level issues, industry-level analysis, firm-level findings based on surveys (conducted primarily by the Lahore School) and policy conclusions and recommendations. What the overview tries to capture is the dynamics of the interaction between the macro, industry and (most importantly) firm level and through this, the constraints and economic opportunities the present situation offers. This provides a framework for devising prudent economic policies and creating

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\* Professor of Economics and Director, Graduate Institute of Development Studies, Lahore School of Economics. The author has also served as Vice-Chancellor of the Pakistan Institute of Development Economics and Chief Economist at the Planning Commission of Pakistan.

an incentives structure to promote new investment that embodies the latest technology. This, in turn, will raise Pakistan's productivity and competitiveness in domestic and global markets.

In his opening address, Dr Bilal U. Haq reminded participants of the well-known but much forgotten advice of Prof. Abdus Salam that, "Unless you are very good at science, you will never be good at technology." Haq gave many examples, including from China, to show that the transfer of technology alone, without developing indigenous research and development (R&D) capabilities, has serious limitations especially when it comes to upgrading this technology or absorbing and adopting newer technologies in the same field.

This vital link between indigenously developed scientific know-how and its practical use in the creation of commercially viable new technologies by developing countries such as Pakistan was an issue that emerged repeatedly during the conference. An interesting concept put forward by Haq, which resonated in many of the presentations, is that of the "technopreneur" – a new breed of private firms that create as well as market their products in the first instance in the domestic market.

The theme "Where Pakistan stands and where it must go" is addressed in the papers by Irfan ul Haque, Rashid Amjad and Namra Awais, Mathew McCartney, and Nazia Nazeer and Rajah Rasiah. While Haque and Amjad and Awais trace the declining trend in productivity post-1990 in some detail, the theoretical models on which they draw have important differences, although these do not appear to change their overall findings. Amjad and Awais use a growth accounting framework that draws on the "new growth theory" to estimate total factor productivity (TFP) trends during 1980–2015, Haque remains skeptical of this approach, but draws broadly similar results of declining productivity based on estimates from the Asian Productivity Organization.

The strength of Amjad and Awais's paper lies in their detailed estimates of TFP, both overall as well as for the major sectors, broken down by different time periods over 1980–2015. Their results suggest that, not only did TFP decline after the 1980s, but the major slowdown in manufacturing after 1990 and in agricultural TFP was not compensated for by a corresponding rise in the services sector (as, for example, happened in India post-1990).

Where Haque and Amjad and Awais firmly agree is that the decline in productivity growth can be explained largely by the steep fall in investment levels (both public and private), especially after 2006. Drawing on Kaldor–Verdoorn’s Law, both papers argue that new investment ‘embodies’ the latest knowledge, innovation and technical progress and that investment and productivity growth are thus closely related. Haque also draws a parallel with ‘learning by doing’ and the positive relationship between the growth of output and the growth of productivity via new investment.

Nazeer and Rasiah concentrate on the manufacturing sector and raise the important question (also discussed at earlier conferences) of Pakistan’s premature deindustrialization. An interesting start is their definitions of premature deindustrialization (a decline in manufacturing productivity while still undertaking low-value-added activities) and the mature deindustrialization witnessed in developed economies (where the share of manufacturing in GDP falls, but its productivity continues to rise).

They compare Pakistan’s experience of the manufacturing sector with that of East Asia (especially South Korea) and Southeast Asia (including Malaysia and Thailand). Here, they show that Pakistan’s industrialization under import substitution in the 1950s and 1960s, while impressive, did not keep pace with that of South Korea and Taiwan (China). They blame Pakistan’s failure to move from low-value-added to higher-value-added goods and the country’s premature deindustrialization on two factors: its failure to develop a well-thought-through industrial policy and its inability to check the rise of a powerful ‘rentier’ industrial vested class, which continued to enjoy the benefits of a protected trade regime.

When Pakistan opened up its economy in the 1990s under the aegis of the IMF and World Bank, it got the worst of both worlds: opening up without any phased or sequenced plan as well as an economic environment where the exchange rate was overvalued due to the rapid growth in remittances (‘Dutch disease’). In the end, one is still left with some questions as to what should have characterized Pakistan’s industrial policy, despite the interesting lessons Nazeer and Rasiah draw from the East Asian and Southeast Asian experience.

Going somewhat against the grain of the earlier papers, McCartney argues that Pakistan’s economic growth, which averaged around 5 percent over 1960–2015, is still respectable when benchmarked against most developing countries’ experience. Given the poor levels of education and

skills among its workforce, any attempt to move to higher-value-added and technologically advanced manufacturing was always going to be problematic. McCartney reinforces this argument by pointing to the troubled investment climate and the government's weak record of implementing sectoral industrial policies (e.g., the Textiles Policy for 2009–14). His conclusion is conservative and cautious – Pakistan should adopt a more gradual approach in moving up the value-added ladder. In this, it could learn from the example of Bangladesh in producing readymade garments in which its current comparative advantage appears to lie.

Maha Khan and Uzma Afzal's paper reinforces Pakistan's poor manufacturing experience by highlighting the lack of export diversification and the fact that its export basket still comprises low-tech, undifferentiated products. They argue, as Nazeer and Rasiah have done earlier, that Pakistan must come up with an industrial policy built on a strategic collaboration between the public and private sectors, although they do not spell out the main features and exact role or direction of such a policy.

Musleh Ud Din, Inayat Ullah Mangla and Muhammad Jamil plot Pakistan's poor ranking on the global innovation index and its low scores on high-technology exports and R&D expenditure. They present the interesting case of the telecommunication sector, where the adoption of prudent deregulation policies has led to rapid growth and modernization, but the subsequent adoption of tax and tariff policies has suffocated the growth of indigenous manufacturing firms in this sector.

They identify lack of entrepreneurship, poor access to finance and most importantly the dearth of world-class technological knowledge as the main reasons that Pakistan has relied primarily on foreign investment and imported machinery to fuel the growth of this fast-growing and dynamic sector. Two additional factors have discouraged domestic producers as well as growth in this sector: the discriminatory tariff regime under which taxes and duties on finished products are much lower than on CKD equipment for local producers and the withholding taxes on mobile services (charged to all users, of who less than 1 percent fall within the tax bracket). These measures have contributed to an overall decline in domestic assembly operations compared to the pre-deregulation phase.

Naved Hamid and Faizan Khalid not only bring out the growth potential of Pakistan's digital economy, but also show how this fast-growing sector has attracted international firms as well as Pakistani technopreneurs – most of them tracing their emergence to the large

number of incubators that were set up post-2012. These incubators provide support services such as mentorship, stipends, office space, broadband Internet, training and funding opportunities. Having detailed a number of success stories, however, the paper fails to provide satisfactory answers to the question of why, despite all these positive developments, its share of new investment output and exports remains marginal.

The optimism found in Hamid and Khalid was also reflected in a presentation at the conference by Aezaz Hussain, a 'technopreneur' whose company Systems Ltd is among the largest domestic IT firms quoted on the Karachi Stock Exchange. Hussain identified a number of areas, including financial services, farmer extension services and support measures for increasing industrial productivity in which the IT sector could play an important role.

In an absorbing presentation on the growth of the tractor industry in Pakistan, Irfan Aqeel, managing director of Millat Tractors, showed how his firm had developed indigenous technology based on imported technology through licensing agreements with foreign firms. This had led to productivity gains and lower costs and had indigenized 90 percent of tractor parts in Pakistan.

## **2. The Firm Level**

It is at the level of the firm that basic decisions on growth, investment (upgrading existing technology and/or replacing it with new technology) and the labor force (skilling, adding or downsizing) are taken. How do firms in Pakistan make these decisions? This critical question is addressed in a number of papers based on research and surveys undertaken by the Lahore School. This is where the conference added the greatest value, with results from the field providing much needed answers to many of the questions raised in earlier papers and discussions at the macro and industry level.

The results of a firm-level survey conducted in 2016 in conjunction with the Lahore Chamber of Commerce and Industry (of which the surveyed firms are members) presented by Mahvish Faran and Azam Chaudhry is a good starting point. Their study shows a vibrant private sector continually innovating and upgrading its technology. Almost 75 percent of the firms surveyed were engaged in technological upgradation, of which a large part is concentrated in the production process. Interestingly, most firms learn about new technology through the Internet,

their customers and exhibitions. The role of public sector institutions and academics is found to be almost nonexistent in manufacturing, where firms also learn of new technologies through foreign suppliers of machinery. In services and retail, a large part of their innovation is in marketing activities.

In a survey of 431 textiles and apparel manufacturers conducted in 2013–15, Waqar Wadho and Azam Chaudhry give concrete proof to the earlier survey. Of this sample of firms, 56 percent had introduced technological and nontechnological innovations during this period. Over half their expenditure was on new machinery and equipment – through it, acquiring newer ‘vintages’ of capital. Market sources are the most important source of knowledge spillovers, with small firms relying on local market sources and large firms mainly on foreign clients and foreign suppliers. Almost 40 percent of the firms had introduced products new to the firm and their efforts were concentrated on improving the quality of their products, not just pursuing growth in sales as their most important objective.

In an interesting paper, Theresa Chaudhry and Mahvish Faran measure productivity and quality differences across three denim producers – a large firm producing for a major multinational brand, a medium firm catering to the export market (mainly European brands) and a small firm producing mainly for the domestic market. The paper presents in painstaking detail the results for measures of productivity (as cost per unit) across the three firms. Productivity in the medium firm was half that of the large firm, while the small firm only a fifth of the the larger firms. The study suggests there could be real productivity gains for the medium and small firms if they were to shift from piece rates for labor to time-determined wage rates (as the larger firm did). As to the choice of technology, which has a very important bearing on the quality of output, both high costs as well as lower sales act as barriers to the introduction of new technology.

In their study of the football industry in Sialkot, Tariq Raza and Azam Chaudhry show that, despite intense competition (especially from China) in foreign markets they had earlier dominated, firms were reluctant to make part of their existing labor force redundant – and this stood in the way of increasing productivity and competitiveness. Similarly, in a study of the sports glove manufacturing industry, Saba Firdousi and Azam Chaudhry compare productivity across the four major firms that dominate domestic production. They find that the firms’ main decision makers see the cost of switching from old to new technologies as being too high and their labor force as being relatively unskilled to work with new technologies.

### 3. Policy Issues

On the key question of how domestic firms can access new technology to reap productivity gains and increase competitiveness, the papers by Shaukat Hameed Khan and Sikander Rahim provide rich insights.

Pointing to Pakistan's dismal performance in patenting new inventions and technologies (the 978 applications filed with WIPO in 2014 by Pakistan are only 2 percent of the total filed by OIC countries), Khan makes a strong case for fostering technology entrepreneurship, given the "blurring boundaries between scientific research and technology application," especially in computers, IT and molecular biology. He points out that Pakistan has developed major technological capabilities in national government laboratories, especially in the strategic sectors, and these need to be shared with private sector firms.

Rahim traces Pakistan's poor record in promoting science and technology (S&T) and offers a pragmatic route for firms to climb up the value-added technology ladder. He shows that most multinationals break down their production process across regions and countries (global value chains) in search of lower wage-costs. Thus, by entering a value chain and establishing their credentials based on good performance, Pakistani firms could move up the value chain by training and upgrading their workforce (including through specialists from their multinational partners).

He argues that upgrading existing firms in low-value-added sectors such as textiles will not produce any real gains: the prices of these goods will remain low in international markets and reducing prices further will only benefit consumers in developed countries. However, he ignores the need for labor absorption in these labor-intensive sectors, given Pakistan's very high growth rate of the labor force. Rahim also shows little faith in the transfer of technology that takes place through foreign direct investment (FDI). His argument is that experience has shown that FDI only comes in to take advantage of Pakistan's protected market; it has hardly ever been a significant player in Pakistan's exports. As with many of the studies in this volume, Rahim rightly argues that the country needs to produce high-quality engineers and scientists as well as an educated and skilled labor force (with good literacy and numeracy skills and a basic knowledge of the sciences). Here, the role of the public sector could be important.

In his concluding remarks, the federal secretary for science and technology, Fazal Abbas Maken, outlined the strengths and weaknesses of

Pakistan's S&T capacity. As regards the former, besides an increase in the number of universities from 54 in 2000 to 174 in 2015, the areas he identified were agriculture and livestock, biology, biotechnology, pharmaceuticals, chemistry and IT. The weaknesses he cited include low government expenditure on S&T (as low as 0.29 percent of GDP), weak linkages between research, industry and academia, the lack of demand-driven research and the absence of high-tech-based entrepreneurship. As to new initiatives, he pointed to the establishment of S&T parks, tax incentives for firms carrying out in-house R&D and employing PhDs as well as subsidies to industry for upgrading technology.

#### **4. Conclusion**

Three key messages emerged from this conference:

1. While emphasizing the need to develop indigenous capacity in scientific research in public sector institutions and academia, the spillovers of this research to the private sector are almost negligible. In this context, the knowledge that has emerged in the development of major technological capabilities in government laboratories needs to be shared with the private sector urgently and under a well-worked-out policy framework.
2. Pakistan has had little success in formulating an industrial policy and (more importantly when done) in implementing it. One way of formulating a pragmatic policy to support the manufacturing sector could be to draw on some of the important findings that emerge from the papers on industry and firms in this volume as well as other studies, e.g., on tapping global value chains, credit and tax incentives for modernization and replacement, improving skills and education levels of the labor force, funding for job displacement and targeting growth in a few selected industries such as telecommunications.
3. As many of the papers point out, the rapid and encouraging signs of growth in the IT sector (in which Pakistan still lags far behind) through policies and incentives promoting the technopreneur has considerable potential.

Perhaps the most important message of the conference is that meetings such as these that bring together scientists, engineers, economists, industry specialists, business leaders and policymakers and draw on field research on the adoption of new technology in the private sector is the only way of coming up with a meaningful 'industrial policy.'