PERFORMANCE OF THE MANUFACTURING SECTOR OF PAKISTAN AND ITS COMPETITIVENESS CAUSE AND REMEDY

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ABSTRACT

The manufacturing sector is of great importance for the economic development of every country. In Pakistan the contribution to GDP of the manufacturing sector over the past three decades has not grown measurably. A vibrant manufacturing sector entails a move from static to high productivity activities, and will contribute towards GDP growth as well as generating employment. This paper reviews the performance of Pakistan's manufacturing sector and highlights its importance in economic development of the country and analyses the reasons behind the sectors apparent lack of competitiveness. It also discusses the standing of the Pakistani manufacturing sector and its capability of producing high-tech products and its share in the global export. Data provided by GEM Pakistan has been analyzed, that leads to suggest optimizing the Pakistani manufacturing sectors approach.

KEYWORDS: *Manufacturing Sector, Competitiveness, GEM*

INTRODUCTION

Countries with strong manufacturing sectors have been shown to perform ahead of their non-manufacturing orientated peers in term of economic growth. The prime factor in the growth and development nations as experienced by the West and newly industrialized countries (NIC) of the East was rapid growth in the manufacturing sector. Trading of manufacturing output internationally has been a core feature of these economics. There is a direct correlation between the concept of manufacturing value added growth rate and GDP growth, i.e., the GDP increases with the increase in manufacturing value addition as depicted in Figure1[1].

Adoption of new technologies in manufacturing sectors develops highly skilled labor and increases the both the sale and quality of products (particularly in the latter case when international standards are met). According to Freeman and Perez[2], the late 1980's represented an era in which a technological paradigm shift was occurring. During this era technologies have been changing at a very fast pace in America, Japan and other developed countries. At that time technology was being considered in all the aspects of human activities. These technologies affected large area of economic life including new

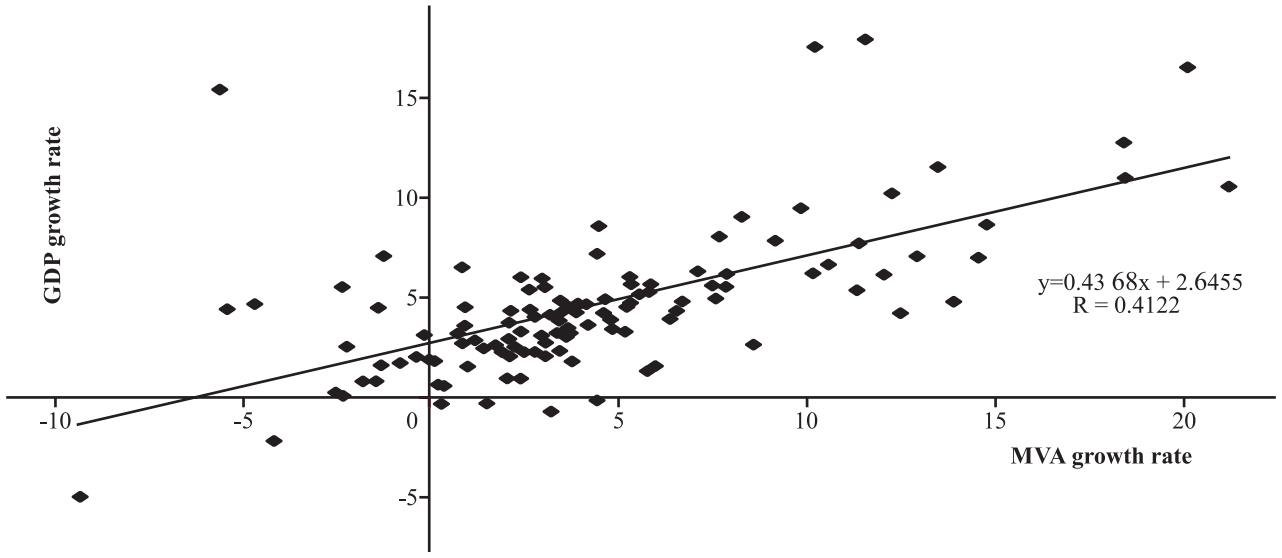

Figure1: Association between Manufacturing Value Added (MVA) Growth& GDP Growth

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materials (composite materials), biotechnology and other technologies.

The National Science Foundation[3] conducted a survey on the production of existing items and new high technologies products from 1985 to 1997. This survey concluded that developed countries like the USA, China, Hong Kong and Japan are the main manufacturers and exporters of high technology products.

Lall[4] provided a more detailed breakdown of manufactured exports by technological category. He divided the manufacturing products into several categories, namely: resource based manufacturing; low technology manufacturing; medium technology manufacturing, and; high technology manufacturing. The first two categories refer to simple manufacturing products, while the latter deal with more complex products. In this case, primary products have been separated from other manufactured products.

Lall[4] also analyzed the growth rates of exports in fifteen different sectors from 1985 to 1998. According to his analysis developing countries grew slower than developed countries in resource based manufacturing and primary products. But developing countries grew more as a whole in comparison to developed countries. He concluded that there are two types of technological up-gradation. The first method is to upgrade skills, production, quality, and to implement process improvement of existing systems. The second method is to switch to complex technologies and machineries. Mowery and Rosenburg[5] also emphasized the use of new technology according to the national context of a country. According to the concept given by Lall[4], developing countries only import the technology from the technically advanced countries. They are the followers of the developed countries and strive for the existing technology. Nielson and Winter[6] showed that importing and mastering new technologies in developing countries is not easy and automatic. Stigilitz[7] stated that technology transfer faces many challenges like coordination, interest and market demand problems. In particular, a firm or organization can lose the skills they have gained due to factors such as switching of labor to other related companies.

According to Lall[8] learning and innovation are two related terms associated with investment in the new technologies. Learning and innovation involves effort, time and risk. The OCED[9] report on industrial innovation concludes that in industrialized (developed) countries, innovation of new technologies plays an important role in both growth rate and policy direction.

Bell[10] has summarized ten basic categories of a technology up-gradation at firm or organization level. These ten categories have been divided in two groups, namely technology development and technology acquisition. The first group includes continuous improvement in production technology, improvement in product specifications, improvement in logistics, reverse engineering for innovation, the search for new technologies and technology development. Whereas the second group includes investment in new technologies, introduction of newly developed/discovered materials and components, investment in new production facilities and investment in manufacturing of new products. Developing countries usually do not invest in new technologies. They tend to import existing technologies and manufacture the associated existing products on small scales. Consequently, such countries tend to lag in the adoption of new developed technologies.

Pakistan is also a developing country in which the industrial sector has been established by cooperation and investment of foreign countries. Yasin[11] emphasized the adoption of computerized numeric control machines and advanced manufacturing processes in the Pakistani industries situated in the Sindh province. This illustrated how the manufacturing sector in Pakistan is not adopting new techniques and technologies. Pakistan's economic survey concludes that, the service sector has shown some notable growth during the past years but manufacturing remained stagnant in contributing towards GDP growth and generating sizeable employment in the country. The performance of the industry in terms of growth rate is even moving towards negative territory as shown in Figure 2[12] and 3[12,13,14].

Poor quality and low tech manufacturing products led the things to be tilted towards the services sector which ultimately put the brakes on high value added activity (Figure 3)

Klinger and Lederman[15] and Cadot et al.[16] suggest a U-shaped relationship between a country's income

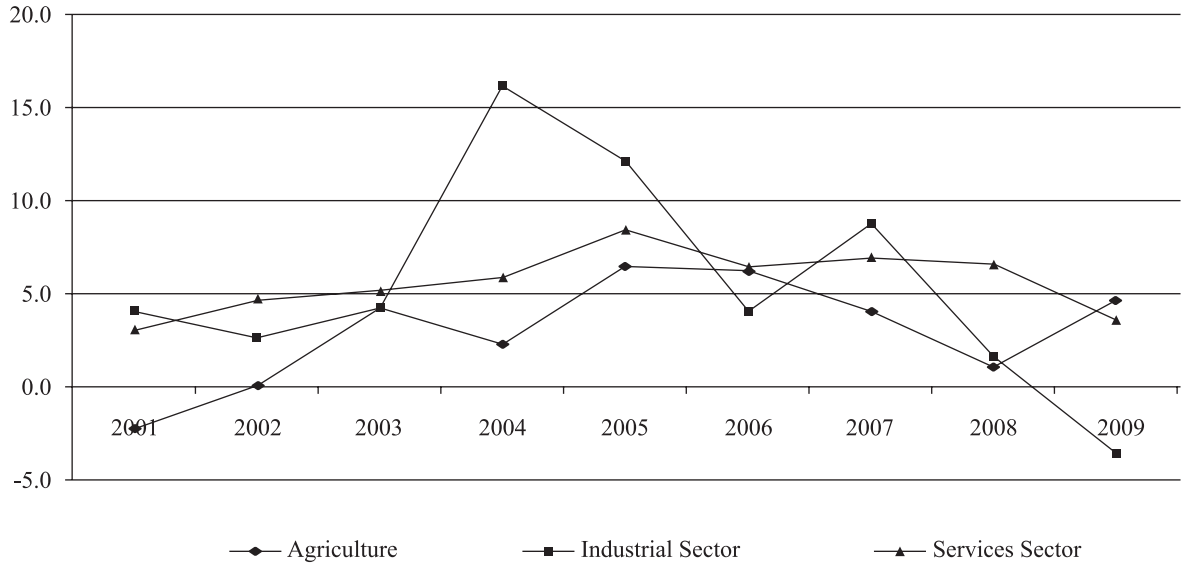

Figure 2: Sector growth rates in Pakistan, 2001–09 (percent)

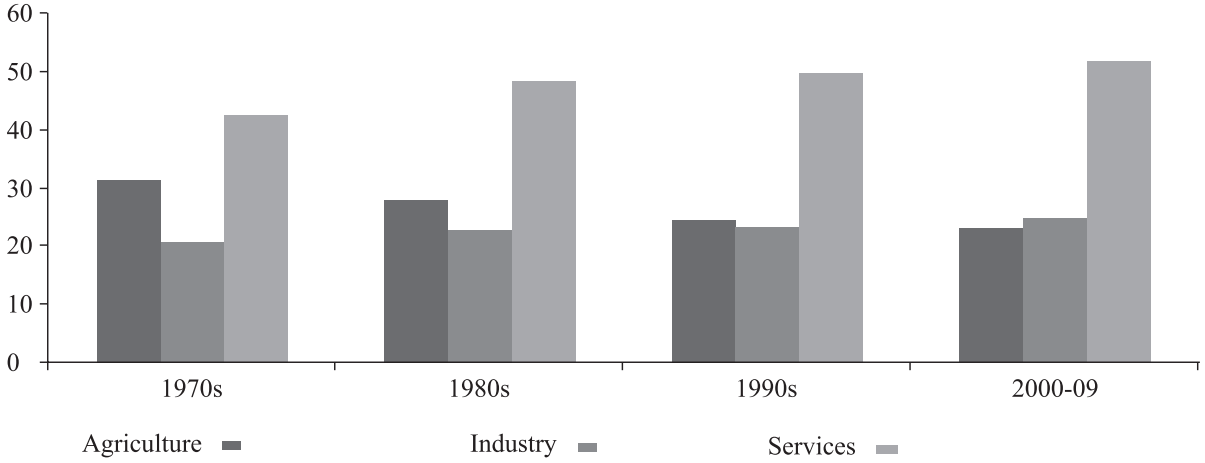

Figure 3: Sectorial Shares in GDP of Pakistan, 1970-2009 (percent)

level and its degree of product specialization. Though the service sector of Pakistan has become the main growth driver, its contribution to employment is limited. Movement of workers from the agricultural to the service sector indicates that the sector with high value addition (e.g. manufacturing) is more attractive but has a lower share in terms of employment due mainly to mechanization and automation. The manufacturing sector only employs some 20% of the workforce, while the service sector employ 30%, illustrating that movement of labor to high productivity activity is low and consequently that the dynamic behavior required to generating a surplus that spurs growth is not yet prevalent.

According to the comparison drawn by Felipe[17] of Pakistan with other Asian countries, the overall share of the manufacturing sector within the individual nations' economies has increased considerably over the past three decades, but it remained stagnant in the case of Pakistan. The manufacturing output share was 35% for the Chinese economy, 24.7% for Korea and 28% and 29.8% for Indonesia and Malaysia respectively, while the manufacturing output share was only 19% of GDP in Pakistan[18].

The growth rate in the manufacturing sector declined from 14.0% in 2004 to 8.2% in 2007 and further to 5.4%

in 2008[18]. This dismal performance can be attributed to the fact that the manufacturing sector continues to be heavily concentrated in low-value-added consumer products, instead of moving its focus to high quality products.

These findings also highlight that the lack of adoption of modern manufacturing techniques and technology at individual company level resulted in non-production of high quality and high tech products. The Manufacturing Value Added growth rate (MVA) across Malaysia and Korea increased by factors of 27 and 40 respectively during last three decades, whereas in Pakistan during the same period the MVA increased by a factor of just 7[19] highlighting that there has not been any marked increase in Manufacturing value added during recent years in Pakistan as shown in Figure 4[19].

Export Performance

In the global market manufactured exports have increased rapidly and many developing countries are controlling a sizeable world market share.

Despite being geographically embedded in a region of countries which have witnessed tremendous success in these sectors, Pakistan is still lagging behind in the implementation of a vibrant manufacturing sector. From 1990 to 2008 exports from India and Malaysia increased on average by 185%, whereas Pakistan's export share declined by 17%, as shown in Table 1[20].

Medium and high technology exports have increased sizably in china and Malaysia, but Pakistan increased its share only in low-tech products. During past two decades the low-tech products increased from 54% to 76% of total exports whereas medium technology products increased from 7.88 to 8.4. % High-tech output remained an insignificant 0.6% of the total export[18].

This also manifest that adoption of technology and modern manufacturing techniques at firm level lacks and continue to resulting in country's export being dominated by low technology manufactures Table 2[20].

The inability of the Pakistani manufacturing sector to adopt technology and export high-tech products is

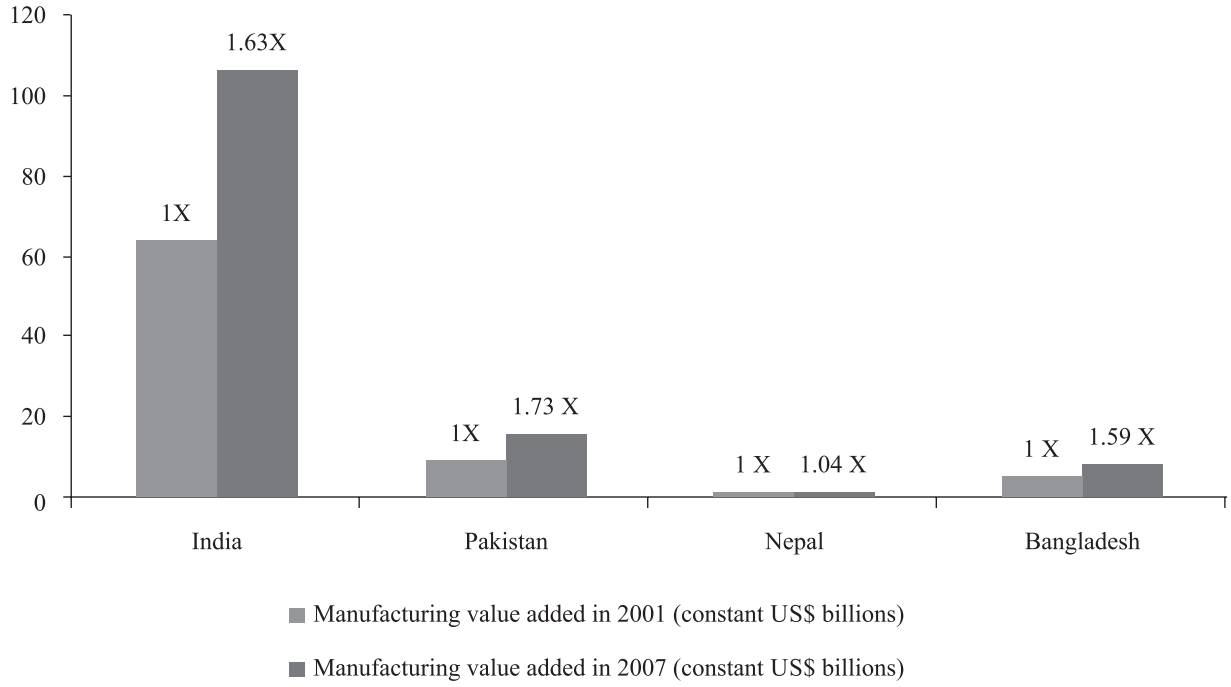

Figure 4: Manufacturing Value Added in US$(Billions), 2001 & 2007 for a selection of countries

depicted in Figure 5[21].

This plot shows the elasticity of Pakistan export with respect to GDP of industrialized countries – namely, by what percentage Pakistan's exports change when the GDP of a given country increases by a single percentage point[21]. The average value of 0.87 for the period highlights the need for upgrading of technology and scientific techniques.

Lall and Weiss[22], suggested that to improve competitiveness a country must upgrade technology and apply new manufacturing techniques. Felipe[17] developed an indicator to quantify countries competiveness. The analysis shows that Pakistan's index in 2004 (4628) is at the same level as was in 1986 (4664). Indonesia and Malaysia were at the same level back in 1970s. The level of India and China was quite high. This situation provides some insight into the reasons for Pakistan's low levels of technology adoption and implementation of modern manufacturing techniques at the individual company level; e.g. a failure to producing high-tech goods and a relatively poor quality of resultant products has effected Pakistan's position in world export leagues[21]. Table 3 shows the growth rate and share of Pakistan in the world exports. In low technology the share is quite remarkable while the growth rate is also encouraging, but, it is the high tech where the share of Pakistan exports (0.18) is very discouraging, despite high growth rate (17.5).

Trainings and Skill Development

The ministry of industry during 2005 suggested a model shown in Figure 6[23], known as a payroll grant system. This aim of model is preparing and readying the workforce through skill development for adoption and application of modern manufacturing techniques and technology requires more than just vocational and

Table 1: Country Export Shares Relative to Total World Exports, 1970-2008 (percent)

	1974	1980	1990	2000	2008
Pakistan	0.14	0.15	0.18	0.15	0.15
India	0.56	0.43	0.57	0.70	1.32
Malaysia	0.55	0.74	0.94	1.61	1.43
Thailand	0.32	0.37	0.74	1.13	1.25

Table 2: Technological Level of Pakistan and World Exports, 1998-2008 (percent)

	Pakistan Exports			World Exports*	
	Growth	Share	Share	Growth	Share
Sector	1998-2008	1998-2000	2006-2008	1998-2008	2008
Total	9.6			10.1	
Primary	10.1	12.3	12.7	11.2	11.4
Resource-based	23.9	3.5	10.9	10.5	14.8
Low-technology	8.2	74.7	66.7	9.2	16.2
Medium technology	8.7	8.6	8.1	10.1	35.5
High technology	17.5	0.8	1.4	9.3	22.1

*Exclusive of oil exports

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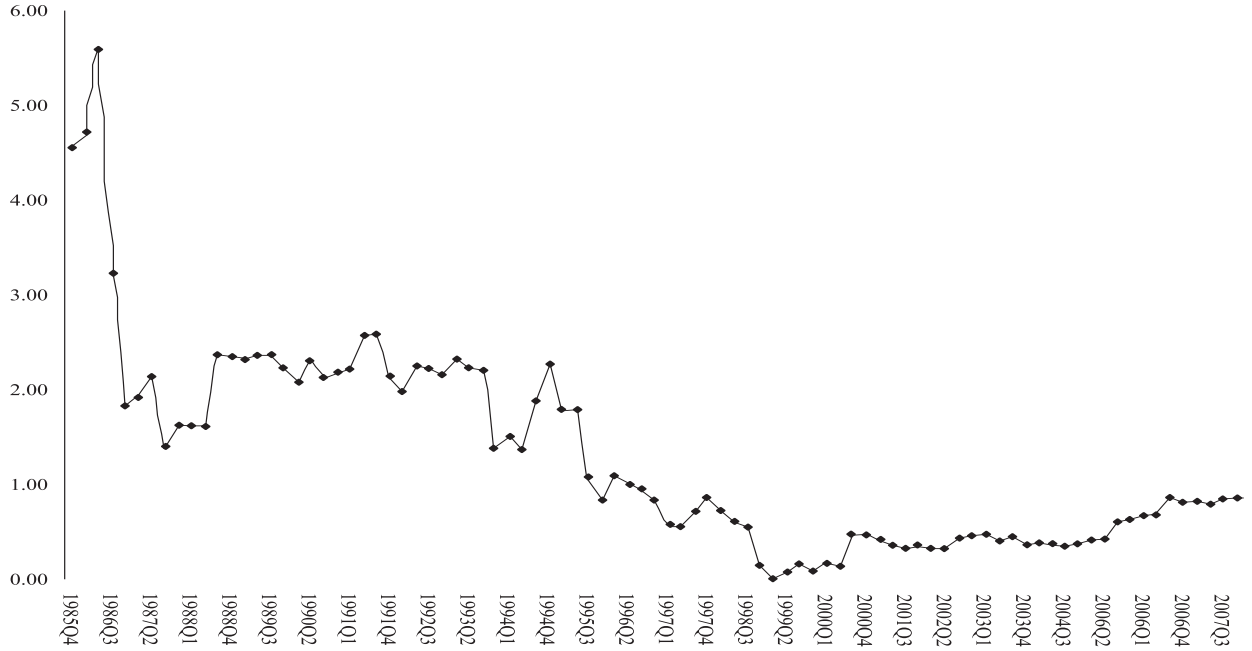

Figure 5: Elasticity of Pakistan's Exports to GDP of Industrial Countries, 1985-2007 (percent)

technical training. Training led by companies themselves hopefully with some incentives driven by the government has an impact on firm-level productivity as seen in several East Asian and Latin American companies. The problem is that the organizations incurred cost on the training is considered as a 'sunk' cost because such investments cannot be retrieved when workers leaves the employer. Thus companies prefer to under invest in training employees. This lack of investment affect is multiplied and magnified when there is deficient information regarding the productivity value of training and skill requirements associated with the use of new technologies and techniques.

Unfortunately the payroll grant system outlined in Figure 6 could not deliver due to a lack of ownership and commitment from the private sector, as well as on the part of relevant department of government. Figure 7 shows the skill based wage subsidy scheme[23].

Under the scheme set out in Figure 7, the government would pay a certain proportion of the minimum wage of

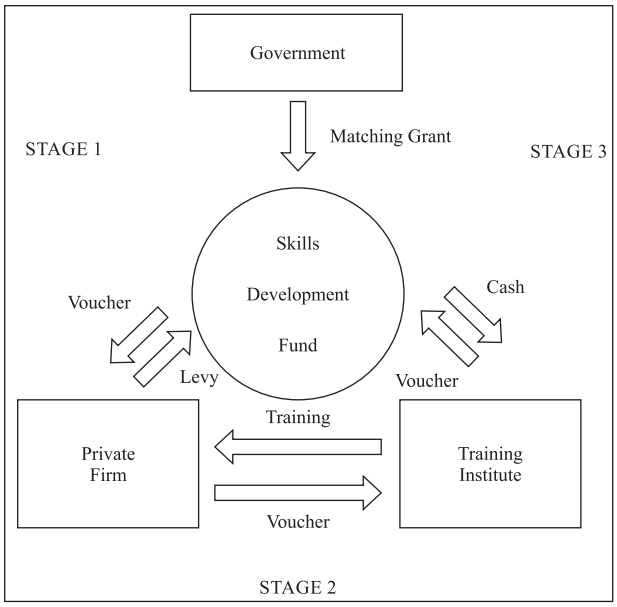

Figure 6: Payroll Grant System

an unskilled worker through the training institute directly to the workers. The quantity of the subsidy would be in accordance with the skill premium in each case.

Global Competitiveness of the Manufacturing Sector in Pakistan

The relatively stagnant growth of the Pakistani manufacturing sector conforms with its low ranking as measuring by Global Competitiveness Index (GCI); e.g. Pakistan ranked at 101 out of 134 countries in 2010 (Table 4)[24].

Competitiveness and competition are two sides of the same coin. Competition plays a vital role in economic development and growth through a resultant drive towards increased productivity and efficiency. Companies growing in competitive markets develop new products, innovate production techniques, and adopt new technologies. For example, Sakakibara and Porter[25] showed that export competition in Japan could be attributed to domestic competition and not to government intervention.

Examination of Global Competition Index[24] shows that Pakistan is ahead of India by two positions (87-89) and Indonesia by nine positions (87-96) in terms of overall infrastructure quality as shown in Table 5.

Table 6 shows that Pakistan is at rank 65 out of 125 countries, with India and Indonesia at 89 and 94 respectively in terms of road transportation infrastructure[24].

According to the WEF Global Competitiveness Report[24], Pakistan trails behind India by 69 points in technology adoption. India also leads Pakistan by 30 points and is ranked at 44 with Pakistan at 74 in terms of production process sophistication.

In the light of above narrated facts based on published literature and keeping in view the findings of the national and international agencies, it is transpired that the abysmal performance of the Pakistani manufacturing sector is mainly due to non-adoption and lack in readiness on new technologies and modern techniques/practices in manufacturing. The fact has also been manifested

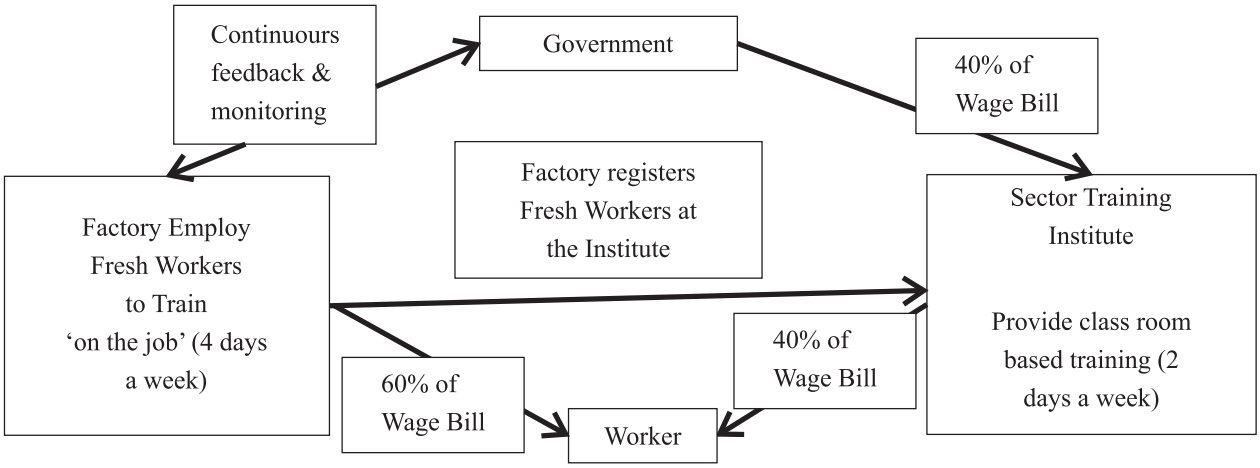

Figure 7: Skill Based Wage Subsidy Scheme

Table 4: Pakistan's Global Competitiveness Index Ratings, 2003-2010

	2003	2004	2005	2006	2007	2008	2009	2010
Rank	73	91	94	91	83	92	101	101
Outof	101	104	117	125	122	131	134	133
Hard score (out of7)	3.4	3.17	3.51	3.66	3.82	3.77	3.65	3.6
Percentile	27.72	12.50	19.66	27.20	31.97	29.77	24.63	24.06

Table 5: Overall Infrastructure Quality

	Country	Rank
1	Indonesia	96
2	India	89
3	China	66
4	Pakistan	87
5	Thailand	41
6	Korea	20
7	Taiwan	19
8	Malaysia	27
9	Hong Kong	3

Table 6: Transport Infrastructure Quality (Rank out of 125 countries)

	Country	Railways	Road	Air
1	Pakistan	51	65	76
2	India	20	89	65
3	Indonesia	60	94	68
4	Thailand	52	35	26
5	Malaysia	19	24	27
6	China	27	50	80

and verified through analysis of relevant portion of the Global Entrepreneurship (GEM) data.

Empirical data of GEM

The Global Entrepreneurship Monitor (GEM)[26], Pakistan, has conducted a very comprehensive survey.

Table 7: Technology and Competition

Country	Firm level technology absorption	FDI and technology transfer	Intensity of local competition	Effectiveness of anti-monopoly policy
Pakistan	99	96	87	78
India	30	19	12	25
Indonesia	65	49	47	30
Thailand	61	50	41	53
Malaysia	37	8	42	47
China	47	77	13	50

The instrument contains a number of very carefully designed questions. GEM's design teams also conduct both an Adult Population Survey (APS) and a National Expert Survey (NES); these data are therefore usefully harmonized. For this paper, the relevant data has been mined from the GEM (NES) survey by using simple filters. The responses to two questions, namely R01 and R03 (detailed below) have been analyzed and plotted in Figure 8.

R01 Companies like to experiment with new technologies and with new ways of doing things

R03 Innovation is highly valued by companies

In response to question R01, only nine percent (9%) of the respondents agreed to the statement that "Companies like to experiment with new technologies and with new ways of doing things". Only three percent (3%) of the respondents agreed to the suggestion that "Innovation is highly valued by companies". The results clearly support

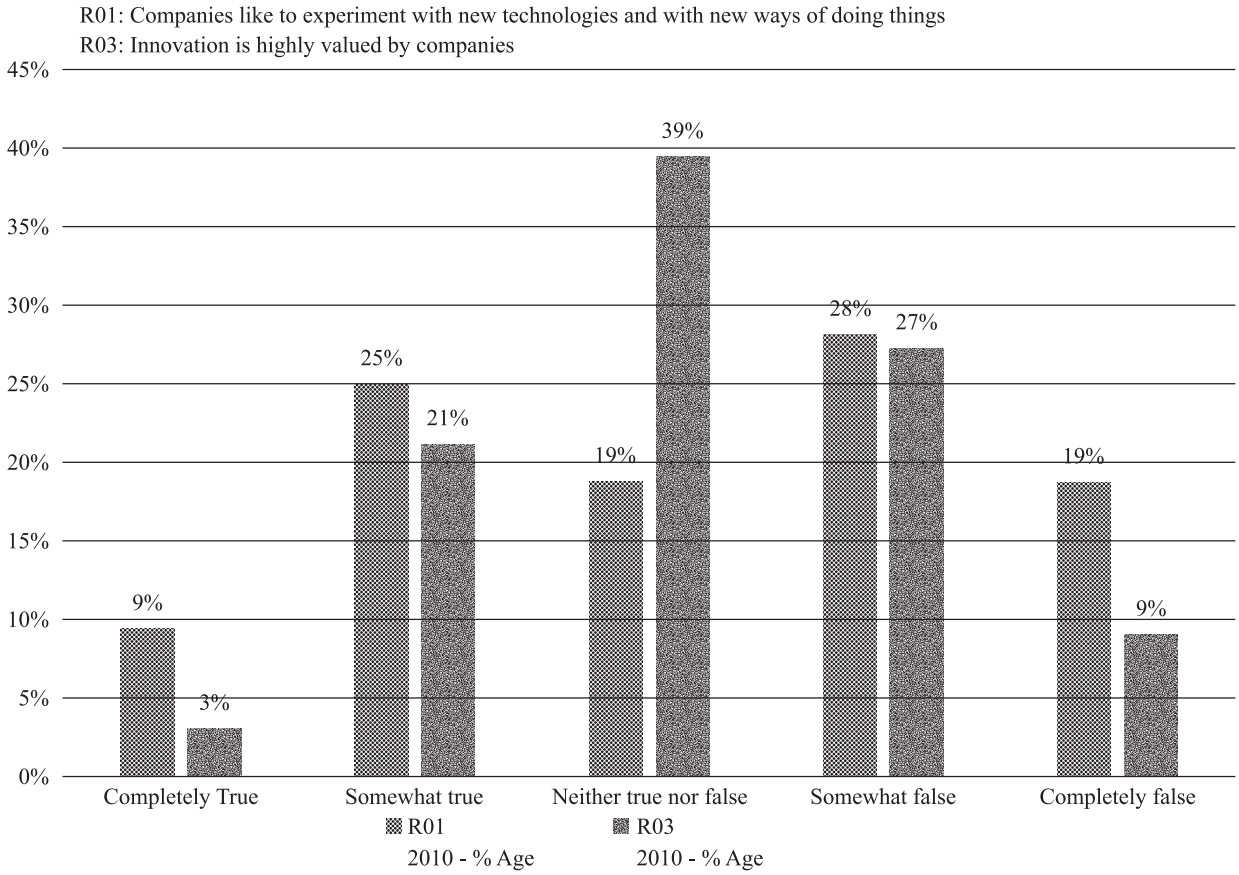

Figure 8: GEM Pakistan 2010 Sampling and Weighting Methodology

the findings of the aforementioned discussion of already published literature.

CONCLUSION AND RECOMMENDATIONS

The findings are interesting and arguably provide well-defined guidance for policy makers within Pakistan and entrepreneurs to mend and rectify their strategies and course of actions to become competitive in with the worldwide manufacturing sector.

The GEM study also manifests and support the findings made on the basis of published material etc. If the government puts due emphasis on, and links some incentives to, the adoption of new technologies, and implementation of modern techniques in manufacturing, Pakistan has the potential to sit within the mainstream in terms of manufacturing development in a relatively short time span of just a few years.

Proper training of the workforce to facilitate adoption of new techniques and technologies is of the greatest imperative. The manufacturing sector is considered to provide high value adding activities throughout the globe and consequently provides extensive job opportunities to both skilled and semiskilled elements of the workforce.

With regards to policy, the points raised above arguably provide a guide to help facilitate a shift in activities towards higher economic value elements such as the competent manufacturing sector, in order to promote sustainable economic growth.

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