

Productivity, Quality and Innovation

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Outline

1. Introduction
2. Objective
3. Productivity Primer
4. Productivity, Quality, Innovation and Competitiveness
5. Pakistan's Current Situation
6. Recap of What Has Been Covered

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1. Introduction

Key Appointments

Current

- Managing Consultant and Chief Productivity Strategist
- working with network of productivity experts and consultants

Recent past

- CEO, Singapore Productivity Centre 2013 - 2016
- Executive Director, Productivity Programme Office, SPRING Singapore 2010 - 2013
- Alternate Director for Singapore, APO 2010 - 2013
- Senior Director, Corporate Development, National Arts Council 2006 - 2009
- Group Director, Enterprise Capabilities & Enterprise Promotion, SPRING Singapore 2004 - 2009

Experience

- Formulating national productivity plans
- Developing frameworks, programmes and schemes for productivity improvement
- Assessing and assisting organisations on productivity
- Undertaking research on productivity
- Writing productivity-related articles and books

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Books in 2017*

- 50 Years of Singapore's Productivity Drive



- Prime.Pack: Lean Transformation and Competitive Advantage for Sustained Growth



* Co-authored with Ms Loo Ya Lee

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Pakistan and Singapore in Perspective

	Pakistan	Singapore
• Land area	880,940 sq km	719 sq km
• Population	199.1 million	5.6 million
• Economic structure (% share of GDP)		
o Agriculture	19.8	-
o Industrial	21.0	30.8
- Manufacturing	13.3	19.8
o Services	59.2	69.2
• Economy	Diverse	City-state

2. Objective

Quotes

*“**Productivity** isn’t everything, but in the long run it is almost everything. A country’s ability to improve its **standard of living** over time depends almost entirely on its ability to raise output per worker”*

*Paul Krugman
Nobel Laureate*



Quotes

*“One underexplored factor behind Pakistan’s generally low and declining **economic growth** between 1990 and 2015 is **labor productivity** ... A closer examination of the trend is both revealing and deeply worrying. In the 1980s, labor productivity grew at 4.2% p.a. By the 1990s, this had plummeted to 1.8%, falling further to 1.3% during 2000–15. ... It is the continuing decline in **total factor productivity (TFP)** over the last 25 years that exposes many of the fundamental weaknesses that bedevil the Pakistani economy.”*

*Rashid Amjad
Professor of Economics
Lahore School of Economics*

Quotes

*“Both **quality** and **innovation** play vital roles for businesses to remain **competitive**. Broadly speaking, quality aims for high and sustainable performance in existing business areas, while innovation aims for breakthrough.”*

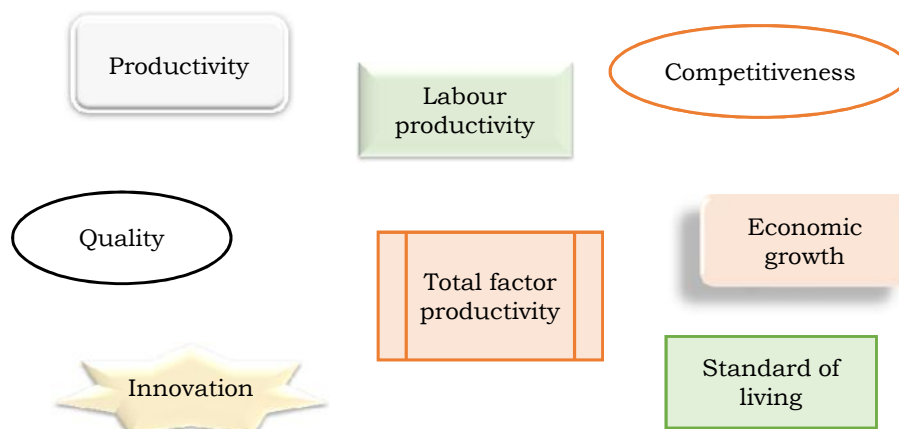
International Journal of Quality and Innovation



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Multitude of Concepts



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Objective

- Explain and demystify the concepts of Productivity, Quality and Innovation, as well as other related terms, and show how they are related

3. Productivity Primer

What is Productivity?

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

- Output = Goods produced or services delivered (products)
- Input = Resources used in producing the products (mainly labour and capital)

What is Productivity?

- Productivity = $\frac{\text{Products}}{\text{Resources}}$
 - amount or value of products obtained from resources used in the production process
 - how well the resources are used to produce the products
- The higher the ratio, the higher is the productivity



How is Productivity Measured?

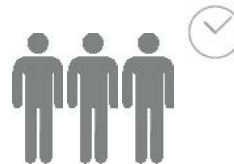
Output : Value Added

- Output is usually expressed in monetary terms
- Common measure
 - Value added = Revenue – Bought-in materials and services required for production
 - Applicable at enterprise, sector and economy levels
- At economy level
 - Value added = GDP
 - Growth of GDP over time = economic growth

How is Productivity Measured?

Input : Labour

- Input is usually expressed in terms of labour
- Common measure of labour
 - No. of hours worked
 - No. of workers



How is Productivity Measured?

Labour Productivity

- Productivity = $\frac{\text{Output}}{\text{Input}}$
- Labour Productivity = $\frac{\text{Value added}}{\text{Labour [no. of workers / hours worked]}}$
- At economy level
 - Labour productivity = GDP per worker / hour worked
 - Growth of GDP per worker / hour worked over time = labour productivity growth
- Labour productivity is the most common measure of productivity

How is Productivity Measured?

Total Factor Productivity (TFP)

- Productivity = $\frac{\text{Output}}{\text{Input}}$
- TFP = $\frac{\text{Value added}}{\text{Workers + Capital}}$
- Measures how well labour and capital are used to produce the products
- Sometimes known as multifactor productivity (MFP)

What Determines Productivity Growth?

Short run: Demand-side Factors

- Fluctuations in labour productivity (GDP/workers) growth due to cyclical changes or events that affect size of demand for economy's products, impacting GDP and capacity utilisation of resources
- Productivity growth pro-cyclical in short run



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What Determines Productivity Growth?

Long run: Supply-side Factors

- Sustainable productivity growth depends on supply-side factors that determine productive capacity of the economy
- Supply-side factors = capital intensity and TFP

$$\text{Labour productivity growth} = \frac{\text{Value added}}{\text{Labour}} \text{ growth} = \frac{\text{Capital}}{\text{Workers}} \text{ growth} + \frac{\text{Value added}}{\text{Workers} + \text{Capital}} \text{ growth}$$

(capital intensity) (TFP)

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What Determines Productivity Growth?

Capital Intensity

- Reflects capital resources available for use in the production process
- Low when investment in capital is insufficient or when rate of increase in workers exceeds that of capital
- Common way of increasing labour productivity
 - shift from labour to capital-intensive activities
 - quality of business environment important for increasing capital intensity
 - diminishing returns over time

What Determines Productivity Growth?

Total Factor Productivity (TFP)

- $$\text{TFP} = \frac{\text{Value added}}{\text{Workers} + \text{Capital}}$$

= **effectiveness** and **efficiency** in the use of labour and capital resources

What Determines Productivity Growth?

TFP: Effectiveness

- Doing the right things
- Ensuring that right products are produced and sold to the market to maximise value added, and that resources are channelled into production of these products
- Product improvement, new product creation and new business models critical to ensure “right products” over time: essence of economic restructuring, spurred by innovation
- Innovation (or technical progress): key driver of sustained effectiveness and TFP growth

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What Determines Productivity Growth?

TFP: Efficiency

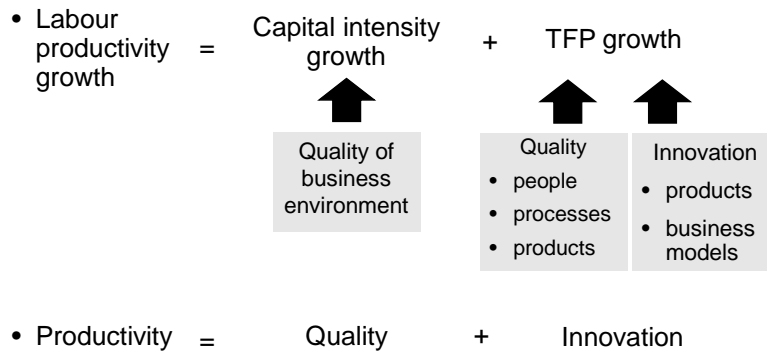
- Doing things right
- Ensuring that the production of products is done right. Depends on:
 - Quality of people
 - Quality of processes
 - Quality of products focus
- Quality: critical for continual improvement in people, processes and products and for sustained efficiency

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What Determines Productivity Growth?

Summary

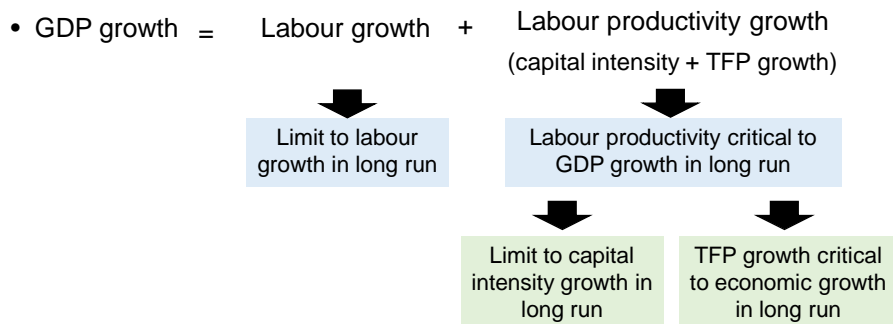


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Why is Productivity Important?

Productivity, Economic Growth and Standard of Living



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Why is Productivity Important?

Productivity, Economic Growth and Standard of Living

- Broad measure of standard of living

$$\text{GDP per capita} = \frac{\text{GDP}}{\text{Population}}$$

- All determinants of GDP growth – especially labour productivity and TFP in long run – affect standard of living

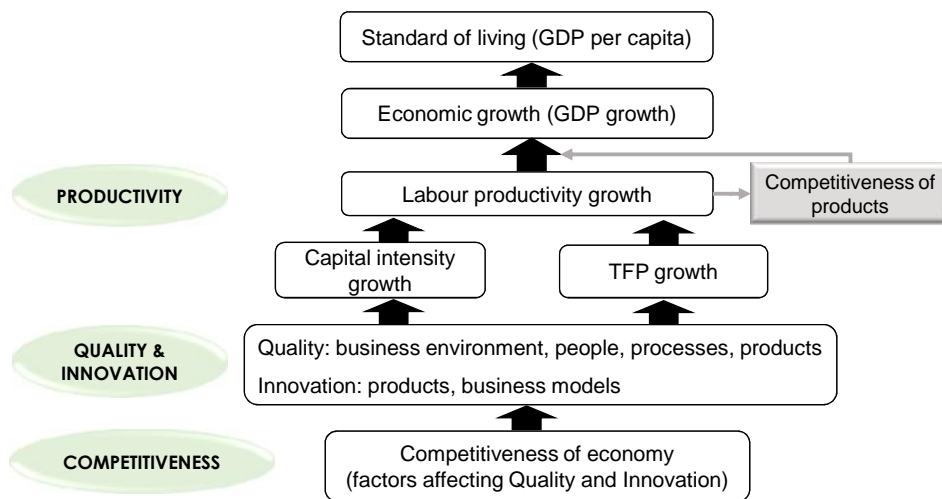
Why is Productivity Important?

Productivity, Competitiveness, Profit and Wages in Enterprises

- Determinants of productivity and reasons for its importance apply at enterprise level as well
- High productivity growth enables an enterprise to:
 - price products competitively, sell more and enlarge market share
 - increase wealth (value added), which makes possible higher profit and higher wages at the same time

4. Productivity, Quality, Innovation and Competitiveness

Framework Linking the Concepts



Competitiveness of Economy

- Defined by World Economic Forum as:

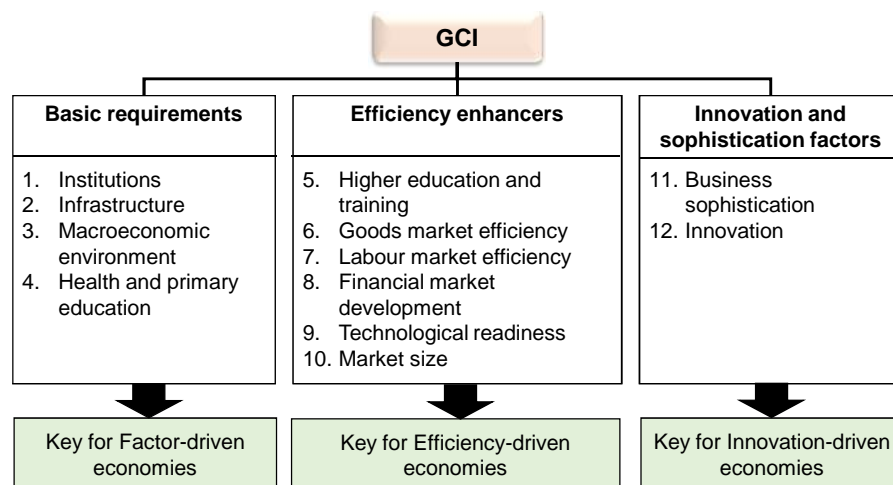
“the set of institutions, policies and factors that determine the level of productivity of a country”

- Competitiveness gauged by:

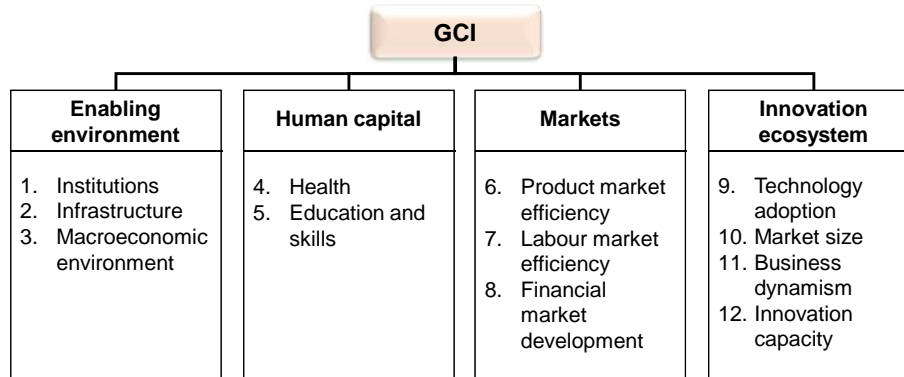
Global Competitiveness Index (GCI)

- summary measure of state of health of the factors that determine a country's productivity

GCI Framework: 2016 - 2017



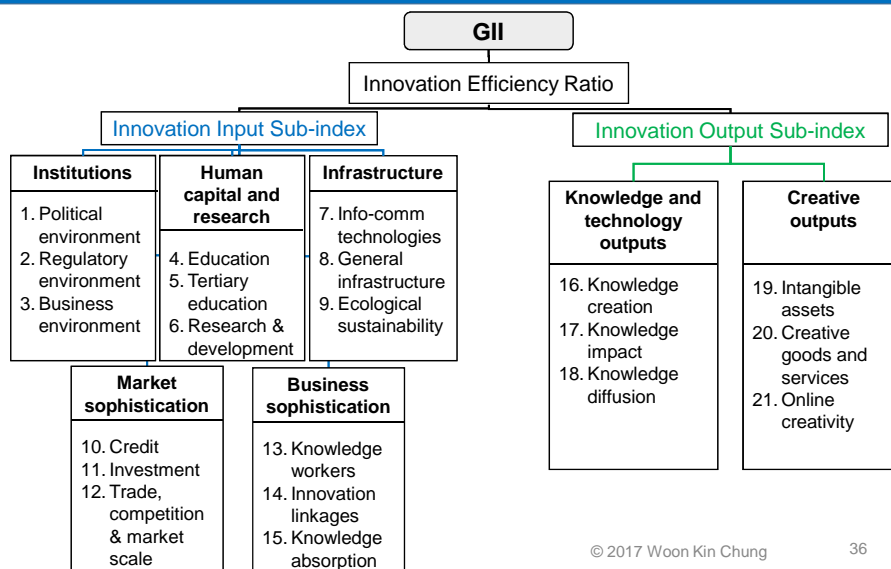
GCI Framework: Beyond 2016 - 2017



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Global Innovation Index (GII) Framework



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5. Pakistan's Current Situation

Standard of Living, Economic Growth and Labour Productivity Growth

Standard of living
(GDP per capita)

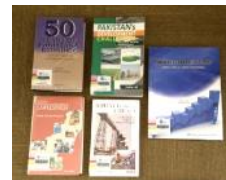
US\$1,500
(ranked 148 out of 189 countries by IMF
based on 2016 current prices)

Economic growth
(GDP growth)

1990 – 2000: 4.6% p.a.
2000 – 2015: 4.6% p.a.

Labour productivity growth
(value added per worker growth)

1990 – 2000: 2.8% p.a.
2000 – 2015: 1.5% p.a.



Global Competitiveness Index (GCI) 2016 - 2017

GCI	Rank	122
	Score	3.49

Basic requirements			Efficiency enhancers			Innovation and sophistication factors		
	Rank	Score		Rank	Score		Rank	Score
1. Institutions			5. Higher education and training*			11. Business sophistication		
	Rank	111		Rank	123		Rank	95
	Score	3.34		Score	2.91		Score	3.65
2. Infrastructure			6. Goods market efficiency*			12. Innovation		
	Rank	116		Rank	117		Rank	75
	Score	2.75		Score	3.89		Score	3.28
3. Macroeconomic environment			7. Labour market efficiency*					
	Rank	116		Rank	129			
	Score	3.79		Score	3.30			
4. Health & primary education*			8. Financial market development*					
	Rank	128		Rank	107			
	Score	3.99		Score	3.44			
			9. Technological readiness					
				Rank	119			
				Score	2.73			
			10. Market size					
				Rank	29			
				Score	4.91			

Rank: out of 138 economies
Score: 1 (worst) to 7 (best) scale
* Ranked lowest among South Asian countries

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Global Competitiveness Index (GCI) 2016 - 2017

Most Problematic Factors for Doing Business in Pakistan

1. Corruption
2. Crime and theft
3. Tax rates
4. Access to financing
5. Government instability
6. Inefficient government bureaucracy
7. Tax regulations
8. Political instability
9. Inflation
10. Inadequate supply of infrastructure
11. Foreign currency regulations
12. Poor work ethic in national labour force
13. Inadequately educated workforce
14. Restrictive labour regulations
15. Insufficient capacity to innovate
16. Poor public health

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Global Innovation Index (GII) 2016																			
GII		Rank	119		Score		22.6												
Innovation Efficiency Ratio		Rank	71		Score		0.6												
Innovation Input Sub-index			Rank	123		Innovation Output Sub-index			Rank	108									
			Score	27.5					Score	17.7									
Institutions		R	124		Human capital & research		R	122		Knowledge & technology outputs		R	90		Creative outputs		R	114	
		S	37.1				S	13.0				S	19.6				S	15.9	
1. Political environment		R	126		4. Education		R	124		16. Knowledge creation		R	71		19. Intangible assets		R	110	
		S	10.3				S	22.6				S	8.3				S	29.3	
2. Regulatory environment		R	113		5. Tertiary education		R	114		17. Knowledge impact		R	87		20. Creative goods & services		R	110	
		S	44.9				S	8.7				S	31.1				S	105	
3. Business environment		R	111		6. Research & Development		R	68		18. Knowledge diffusion		R	99		21. Online creativity		R	105	
		S	56.1				S	7.6				S	19.5				S	0.9	
Infrastructure		R	114		Market sophistication		R	105		Business sophistication		R	97		Rank: out of 128 economies Score: 0 (worst) to 100 (best) scale ○ Weakness				
		S	26.5				S	35.7				S	25.3						
7. Information & communication technologies		R	106		10. Credit		R	122		13. Knowledge workers		R	78						
		S	26.0				S	12.3				S	34.1						
8. General infrastructure		R	121		11. Investment		R	70		14. Innovation linkages		R	115						
		S	20.9				S	35.0				S	18.6						
9. Ecological sustainability		R	108		12. Trade, competition & market scale		R	69		15. Knowledge absorption		R	91						
		S	32.6				S	60.0				S	23.2						

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Pakistan 2025		
Goals	Today	2025
<ul style="list-style-type: none"> Economic development status 	Lower middle income economy - GDP per capita: US\$1,500 - 44 th largest economy	Upper middle income economy - GDP per capita: US\$4,200 - Among 25 largest economies
<ul style="list-style-type: none"> Economic (GDP) growth 	4% p.a.	8% p.a. from 2018 - 2025
<ul style="list-style-type: none"> Productivity (share of TFP in GDP growth) 	¼ of level in 1980s	TFP share doubled
<ul style="list-style-type: none"> Global Competitiveness Index (GCI) ranking 	122 out of 138 economies	Among top 75 economies

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Pakistan 2025

“Pakistan Vision 2025 seeks to drive income growth through sustained improvement in total factor productivity, rather than increasing input levels.”

6. Recap of What Has Been Covered

Productivity Primer

- What is productivity?
- How is productivity measured?
- What determines productivity growth?
- Why is productivity important?

Productivity, Quality, Innovation and Competitiveness

- Framework linking Productivity, Quality, Innovation, Competitiveness, Economic Growth and Standard of Living
- Global Competitiveness Index framework
- Global Innovation Index framework

Pakistan's Current Situation

- Standard of living, economic growth and productivity growth
- Performance on Global Competitiveness Index
- Performance on Global Innovation Index
- Pakistan 2025 Goals

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Thank you