

Innovative India

A Sub-national Competitiveness Analysis

Editors

Rohanshi Vaid

Zhang Xuyao

Innovative India: A Sub-national Competitiveness Analysis

If you would like to request for an e-copy of the whole book, please drop us an email at aci@nus.edu.sg

Published by

Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore

469C Bukit Timah Road, Wing A, Level 3, Oei Tiong Ham Building Singapore 259772

Innovative India: A Sub-national Competitiveness Analysis

Copyright © 2024 by Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore

All rights reserved. This book, or parts thereof, may not be reproduced or modified in any form, including photocopying, recording or any information storage and retrieval system now known or to be invented, without written permission from the publisher.

ISBN: 978-981-18-9513-5

Desk Editor: DW HQ Pte Ltd
Email: hello@dwhq.com.sg

About ACI

The Asia Competitiveness Institute (ACI) was established in August 2006 as a research centre at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS). It aims to build intellectual leadership and network for understanding and developing competitiveness and sustainable growth in Asia. ACI seeks to contribute to the enhancement of inclusive growth, living standards, and institutional governance through competitiveness research on sub-national economies in Asia. It identifies mitigating issues and challenges for potential public policy interventions through close collaboration with regional governments, business corporations, policy think tanks, and academics. ACI's three key research pillars include (i) sub-national economies level competitiveness analysis, (ii) emerging sustainable development landscape in 16 Asia economies, and (iii) Asia's long-term growth strategies and public policy analysis.

ACI's value propositions may be encapsulated in its acronym:

Analytical inputs to initiate policies for policy-makers and business leaders in Asia
Capacity building to enable others through improvement in productivity and efficiency
Intellectual leadership to create pragmatic models of competitiveness and inclusive growth

Vision and Mission

- ACI's over-arching vision is to build up its research credibility with policy impact, contributing as a professional, world-class think-tank.
- ACI's mission is to establish our niche as a leading policy think-tank by identifying development trends, opportunities, and challenges among Asian economies and business corporations.
- ACI endeavours to articulate sound recommendations, promote discussion, and shape research agenda in the arena of public policy amongst Asian governments.
- ACI undertakes evidence-based analysis of public policy issues and decisions, in order to provide assessment of their effectiveness as well as economic and societal impact.

Preface

The year 2023 was one of recovery from the last remnants of the COVID-19 pandemic. Supply chains and financial conditions normalised, leading to a global growth of 3.1% in 2023, slightly higher than expectations. Global headline inflation also improved to 5.3% in the first half of 2023 from 11.6% the previous year. However, venture investments, abundant in 2021, sharply declined in 2022 and 2023. This is because investors turned cautious amidst still high inflation, an anticipation of further interest rate hikes and uncertainty over macroeconomic and geopolitical developments. This funding crunch paralysed investments in innovation as startups new and old closed down, the most notable incident being WeWork filing for bankruptcy at the tail end of 2023. A similar development in India was when Byju's, a leading ed-tech player, saw its valuation drop to US\$200 million from US\$22 billion in 2022. With its cash reserves drying up, the company has struggled to raise capital.

However, braving global headwinds, India was ranked the most innovative economy among lower middle-income groups as per the Global Innovation Index (2023). India's technological progress, digitisation of compliance processes, and an enabling business environment has allowed the country to produce and nurture startups. India also raised over 5% of the global venture funding in 2023 and attracted significant Foreign Direct Investment (FDI) inflows of around 1.5% of its Gross Domestic Product (GDP) in 2022-23. Also, policies, especially those targeted towards raising private sector R&D spending in sunrise sectors, make India conducive for startup activity and innovation. India's Information Technology (IT) services, healthcare and agriculture sectors have been boosted by innovative startup activity.

The value-add of the research carried out by the Asia Competitiveness Institute (ACI) on sub-national competitiveness in India lies in its emphasis on the vast heterogeneity throughout the 36 sub-national economies. Further, the book produces rankings of sub-national economies using ACI's wide-encompassing Innovation Index. Besides, it also offers a case study on India's startup scene, elaborating on relevant state policies to encourage startup activity and a comprehensive analysis of top-performing sub-national economies. Policymakers can use the rich insights offered by this book to craft holistic, relevant and well-tailored policies.

I am confident that this book will further the understanding of India's complex and ever-changing diversity at the sub-national level, and supplement existing literature on the nation's competitiveness.

Professor Paul Cheung
Director, Asia Competitiveness Institute
Lee Kuan Yew School of Public Policy
National University of Singapore

Contents

<i>About Asia Competitiveness Institute (ACI)</i>	<i>i</i>
<i>Preface</i>	<i>ii</i>
<i>Executive Summary</i>	<i>vi</i>
<i>Acknowledgments</i>	<i>viii</i>
<i>List of Figures, Tables and Boxes</i>	<i>ix</i>
<i>List of Abbreviations</i>	<i>xiii</i>
Chapter 1 Introduction	1
<i>Akshaya Balaji</i>	
1.1 Introduction and Motivation	1
1.2 A Macroeconomic Overview of India’s Economy	4
1.3 Roadmap of the Book	14
References	14
Chapter 2 2023 Annual Update on Competitiveness for 36 Sub-national Economies of India	18
<i>Rohanshi Vaid and Zhang Xuyao</i>	
2.1 Introduction	18
2.2 Research Methodology	23
2.2.1 Four Environments, 11 Sub-Environments and 75 Indicators	23
2.2.1.1 Computation of Competitiveness Ranking using Equal Weights	24
2.2.1.2 The Standardised Score	25
2.2.1.3 <i>What-if</i> Competitiveness Simulation Analysis	25
2.2.2 Shapley Value: A Novel Approach to Assignment of Weights	26
2.2.2.1 Shapley Weightage – The “Bottom up” Approach	27
2.2.2.2 Comparison between the Shapley Method and the Entropy Method	27
2.3 Competitiveness Analysis Results for 36 Sub-national Economies of India	29
2.3.1 Overall Competitiveness Ranking and Scores	29
2.3.2 Ranking and Scores by Four Environments	33
2.3.3 <i>What-if</i> Competitiveness Simulation Analysis on Overall Competitiveness	46
2.3.4 <i>What-if</i> Competitiveness Simulation Analysis on Four Environments	48
2.3.5 Median and Maximum Competitiveness Web Analysis	55

2.4	A Comparison of Results using Shapley Weights Methodology and Equal Weights Methodology	56
2.5	Analysis of Top Five Best Performers and Bottom Five Lagging Performers by Environment.....	59
2.5.1	Macroeconomic Stability	62
2.5.2	Government and Institutional Setting	66
2.5.3	Financial, Businesses and Manpower Conditions.....	69
2.5.4	Quality of Life and Infrastructure Development.....	72
2.6	Concluding Notes	75
	References	76
Chapter 3 2023 Annual Update on Competitiveness for Five Regions of India		78
<i>Rohanshi Vaid</i>		
3.1	Introduction	78
3.2	Regional Competitiveness Framework	79
3.3	Empirical Findings: An Analysis of Regional Competitiveness	80
3.3.1	Overall Competitiveness Ranking and Scores	81
3.3.2	Ranking and Scores by Four Environments	83
3.3.2.1	Macroeconomic Stability.....	83
3.3.2.2	Government and Institutional Setting.....	85
3.3.2.3	Financial, Businesses and Manpower Conditions	88
3.3.2.4	Quality of Life and Infrastructure Development	91
3.3.3	Median and Maximum Competitiveness Web Analysis	94
3.3.4	Analysis of Top 20 Percent Strongest and Weakest Indicators.....	97
3.3.4.1	Eastern Region	97
3.3.4.2	Northern Region.....	98
3.3.4.3	North-eastern Region.....	100
3.3.4.4	Southern Region.....	101
3.3.4.5	Western Region	103
Box 3.1	Cross-year Comparison for 5 Indian Regions	104
3.4	Concluding Notes	110
	References	111
Chapter 4 Innovation Index: An Analysis of the Sub-national Competitiveness		112

Rohanshi Vaid, Akshaya Balaji and Ammu George

4.1 Introduction.....	112
4.2 Methodology and Data	115
4.2.1 Research and Development	115
4.2.2 International Connectivity	115
4.2.3 Human Capital.....	115
4.2.4 Governance	116
4.3 Analysis of Sub-National Economies' Innovation Rankings and Scores.....	117
4.4 Analysis of Sub-National Economies' Rankings and Scores across environments	121
4.4.1 Research & Development.....	122
Box 4.1 The Sub-national Evolution of the Startup Ecosystem in India	124
4.4.2 International Connectivity	130
4.4.3 Human Capital.....	131
4.4.4 Governance	132
4.5 Concluding Notes	133
References	133
Appendix 1 About the Authors	138
Appendix 2 List of Indicators for the 36 Sub-national Economies of India	140
Appendix 3 Computation of Rankings using Equal Weights – The Algorithm	145
Appendix 4 Computation of Rankings using Shapley Weights – The Algorithm	148
Appendix 5 Notes on Data Aggregation for Computation of Regional Rankings	151
Appendix 6 Lists of Indicators for Innovation Index, Scores and Ranks of 33 Sub-national Economies of India	157

Executive Summary

The year 2023 saw countries emerging from the ravaging social, humanitarian and economic fallout of the COVID-19 pandemic. While this was a development worth celebrating, there was a worrying consequence. The post-COVID-19 environment was one of sky-high, rising inflation that prompted monetary authorities to quell the rise with interest rate hikes. This clipped Venture Capital (VC) flows into startups and the latter suffered. As investors turned towards safer investment avenues (like government bonds), capital reserves for startups ran dry and a long, funding winter ensued. During this period, startup creation declined at a drastic pace across the United States (US) and Europe.

Fortunately, the negative impact on India's startups was not as extreme. In fact, the country is among the top five global markets and brought in 5.6% of the global VC. India's startup ecosystem is thriving due to enabling government reforms, investment-directed policies, the provision of financial support, and heavy-handed investments in bolstering infrastructure. The latest push to encourage innovation and nurture startup activity was seen through promising schemes announced during the 2024-25 Interim Budget presentation. Also, private sectors are slated to have access to a Rs 1 lakh crore corpus to facilitate R&D investments in sunrise sectors.

India's macroeconomic performance was also strong this year. Robust domestic demand pulled up the country's real Gross Domestic Product (GDP) growth to 6.3%, with the International Monetary Fund (IMF) projecting 6.5% in 2024. Inflation rates have stabilised, service sector growth and export numbers have been high, and fiscal health and Current Account Deficit (CAD) has improved. Lastly, the technology and innovation sectors have ushered in high volumes of Foreign Direct Investment (FDI) flows. At the national-level, these are encouraging developments but when the depth of analysis is increased to regional and sub-national levels, interesting insights come forth.

This book *Innovative India: A Sub-national Competitiveness Analysis* is an attempt to analyse the competitiveness of India's 36 sub-national economies and five regions in detail. As per the results, Maharashtra has retained the spot for the most competitive sub-national economy for the eleventh straight year. The state prides itself on strong physical infrastructure, efficiency in business practices, financial deepening and its appeal to foreign investors. But Maharashtra has considerable scope for improvement in enhancing the standard of living and social stability for its residents. On the contrary, Jharkhand is the least competitive Indian state. Specifically, it fares poorly in ensuring decent living standards and its technological infrastructure requires strengthening. Nevertheless, the state scores high in openness to trade and services, and attracts considerable foreign investment.

On the whole, the Western and Southern regions contain the highly competitive states. The former boasts robust merchandise exports, resilient financial infrastructure and significant FDI inflow. The latter features many tertiary education institutions, high labour productivity and low infant mortality rates. On the downside, both regions are plagued by a high old-age dependency ratio and low healthcare spending. Next, the Northern region offers a conducive environment for businesses to thrive, displays robust physical infrastructure and a vast pool of educational and industrial training institutes. However, this region's health expenditure demands attention.

The North-eastern region is the least competitive of the five regions. Four out of the seven states face developmental hurdles and there is a need to enhance physical infrastructure and fiscal stability. That said, the North-east outtrivals the other regions in medical infrastructure and educational spending. The Eastern region displays one of the highest healthcare spending and a favourable budget balance. But low labour productivity, lagging infrastructure development, and poor financial and business conditions pull down this region's performance.

The book also presents the Innovation Index Framework to quantify the innovation landscape across India's sub-national economies. Four distinct environments make up this index – Research & Development, International Connectivity, Human Capital and Governance. Through this index, our analysis produced some noteworthy findings.

First, innovation requires significant infrastructural development, and geographical features (like uneven terrain) may pose hindrances to infrastructural activities. Our results corroborated this argument; the top-scoring states in the overall Innovation Index are concentrated in the Northern, Western and Southern regions. The low-scorers are the North-eastern and Eastern counterparts. Also, the top-performing Western region has more private Research and Development (R&D) entities, signalling industry-led innovation while the bottom-scoring North-eastern region accounts for more government-supported R&D units. This suggests that states endowed with challenging geographical terrain depend on the government's push to improve their innovation capabilities.

Second, despite the stellar R&D performance of the Western and Northern states of Gujarat and Uttar Pradesh, their scores are the lowest in the Human Capital environment due to poor talent retention.

Third, Karnataka's capital city Bengaluru, India's Silicon Valley, is known for its prominence in startup creation and innovation. Unfortunately, it is also known for fraudulent activities, with 81% of all electronic crimes in Karnataka reported in Bengaluru. The city also records the highest number of extortion, phishing, trademark and copyright violations.

We also present a detailed note on the progression of India's startup ecosystem at the regional and sub-national levels in the last five years. The Northern, Western and Southern regions spearhead startup proliferation, with the West and South in close contest. One explanation for this is that these two regions contain the largest share of startup incubators in the country. At the sub-national level, Maharashtra and Gujarat emerge as leaders with the former edging out the latter by a reasonable margin. Among other factors, this occurrence is attributable to encouraging policy initiatives, the ease of doing business and high investment flows in these states.

Acknowledgments

Asia Competitiveness Institute (ACI) at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS) has been analysing India's competitiveness at the regional and sub-national levels for each year since 2000. This year's publication titled "*Innovative India: A Sub-national Competitiveness Analysis*" was led by Dr Zhang Xuyao and Rohanshi Vaid, aided by Dr Ammu George and Akshaya Balaji.

This book is the latest addition to our studies on regional and sub-national competitiveness. Our study accounts for India's regional heterogeneity in assessing the country's strengths and weaknesses. We do this by considering relevant factors that support the sustained development of the regions and sub-national economies over time. Our assessment at the sub-national level offers itself as a guide to creating informed and targeted policies. From employing Shapely Weights to drive robustness into our study to running *what-if* simulations that consider likely scenarios of improvements in a weakly-performing sub-national economy, our analysis is holistic and comprehensive. In this edition, we also present ACI's Innovation Index Framework that examines the sub-national economies' innovative competitiveness. Lastly, we provide a detailed snapshot of India's thriving startup ecosystem at the sub-national level, a propeller of innovation and entrepreneurial activity.

This book would not have come to fruition without the constant support and endless dedication of our research and administrative colleagues. We extend our gratitude to ACI Director Professor Paul Cheung for his valuable contributions towards this publication. Further, we take this opportunity to thank the administrative team – Cai Jiao Tracy, Po Lai Yin Lyne, Nur Atiqah Binte Rahmat and Dewi Jelina Ayu Binte Johari, and the research staff Dr Xie Taojun, Dr Banh Thi Hang, Dr Liu Jingting, Dr Yi Xin, Ng Wee Yang, Tan Kway Guan, Ge Yixuan, Guo Meiling, Huang Yijia, Lu Miranda, Lu Weilin, Sengtschmid Ulrike, Tan Faith, Xu Ni Scarlet, Yan Bowen and Yap Russell.

We also express our appreciation for the encouragement provided by Professor Danny Quah (Dean), Professor Kanti Prasad Bajpai (Vice Dean – Research and Development), Professor Suzaina Kadir (Vice Dean – Academic Affairs), Francesco Mancini (Vice Dean – Executive Education), Andrew Francis-Tan (Assistant Dean – Student Affairs), Naniek Yuliati (Deputy Director, Head of Administration) and other colleagues at LKYSPP, NUS for bringing this project to life.

List of Figures, Tables and Boxes

Figures

Chapter 1

- Figure 1.1 Number of Unicorns in India and China (2016-2022)
- Figure 1.2 Number of Recognised Startups in India since the launch of the Startup India Initiative, 2016
- Figure 1.3 Percentage Share of Government and Business Enterprise Sector in Gross Expenditure on R&D
- Figure 1.4 India's Real GDP Growth in Perspective (Percent)
- Figure 1.5 Quarterly Real GDP Growth (Change over Same Quarter Previous Year) (Percent)
- Figure 1.6 Annual Real GDP Growth and Inflation (Percent)
- Figure 1.7 Supply-Side Contributions to GVA Growth (Percent)
- Figure 1.8 Demand-Side Contribution to GDP Growth (Percent)
- Figure 1.9 Fiscal Balance (Percent of GDP)
- Figure 1.10 Key Fiscal Indicators (Percent of GDP)
- Figure 1.11 National Savings, Investment and Current Account Deficit (Percent of GDP)
- Figure 1.12 Export and Import of Merchandise Trade and Trade Balance (US\$ billion)
- Figure 1.13 FDI Inflows to India (US\$ billion and percent of GDP)

Chapter 2

- Figure 2.1 IMD World Competitiveness Overall Ranking for Selected Asian Economies (2012-2023)
- Figure 2.2 World Economic Forum Global Competitiveness Index Ranking for Selected Asian Economies (2012-2017)
- Figure 2.3 World Economic Forum Global Competitiveness Index Ranking for Selected Asian Economies (2018-2019)
- Figure 2.4 ACI's Competitiveness Framework
- Figure 2.5 Map of Overall Competitiveness Ranking for 36 Sub-national Economies of India (2023)
- Figure 2.6 Map of Macroeconomic Stability Ranking for 36 Sub-national Economies of India (2023)
- Figure 2.7 Map of Government and Institutional Setting Ranking for 36 Sub-national Economies of India (2023)
- Figure 2.8 Map of Financial, Businesses and Manpower Conditions Ranking for 36 Sub-national Economies of India (2023)
- Figure 2.9 Map of Quality of Life and Infrastructure Development Ranking for 36 Sub-national Economies of India (2023)
- Figure 2.10 Median Competitiveness Web Analysis – Jharkhand (2023)
- Figure 2.11 Maximum Competitiveness Web Analysis – Maharashtra (2023)
- Figure 2.12 Comparison of Weights for Each Environment

- Figure 2.13 Overall Competitiveness Ranking – Comparison between Equal Weights and Shapley Weights Methodology (2023)
- Figure 2.14 Analysis of Best Performers — Overall Competitiveness (2013-2020)
- Figure 2.15 Analysis of Lagging Performers — Overall Competitiveness (2013-2020)
- Figure 2.16 Analysis of Best Performers — Macroeconomic Stability (2013-2023)
- Figure 2.17 Analysis of Lagging Performers — Macroeconomic Stability (2013-2023)
- Figure 2.18 Analysis of Best Performers — Government and Institutional Setting (2013-2023)
- Figure 2.19 Analysis of Lagging Performers — Government and Institutional Setting (2013-2023)
- Figure 2.20 Analysis of Best Performers — Financial, Businesses and Manpower Conditions (2013-2023)
- Figure 2.21 Analysis of Lagging Performers — Financial, Businesses and Manpower Conditions (2013-2023)
- Figure 2.22 Analysis of Best Performers — Quality of Life and Infrastructure Development (2013-2023)
- Figure 2.23 Analysis of Lagging Performers — Quality of Life and Infrastructure Development (2013-2023)

Chapter 3

- Figure 3.1 Map of the Five Regions of India (2020)
- Figure 3.2 Map of Overall Competitiveness Rankings for Five Regions of India (2023)
- Figure 3.3 Regional Sub-Environment Scores for Macroeconomic Stability
- Figure 3.4 Map of Macroeconomic Stability Ranking for Five Regions of India (2023)
- Figure 3.5 Regional Sub-Environment Scores for Government and Institutional Setting
- Figure 3.6 Map of Government and Institutional Setting Ranking for Five Regions of India (2023)
- Figure 3.7 Regional Sub-Environment Scores for Financial, Businesses and Manpower Conditions
- Figure 3.8 Map of Financial, Businesses and Manpower Conditions Ranking for Five Regions of India (2023)
- Figure 3.9 Regional Sub-Environment Scores for Quality of Life and Infrastructure Development
- Figure 3.10 Map of Quality of Life and Infrastructure Development Ranking for Five Regions of India (2023)
- Figure 3.11 Median Competitiveness Web Analysis: North-eastern Region (2023)
- Figure 3.12 Maximum Competitiveness Web Analysis: Western Region (2023)

Chapter 4

- Figure 4.1 Global Innovation Index (Score)
- Figure 4.2 Research & Development (R&D) Expenditure (Current prices)
- Figure 4.3 Patent Applications (Thousands)
- Figure 4.4 Innovation Index Framework

- Figure 4.5 Map of Overall Innovation Index Rankings for 33 Sub-national Economies of India
- Figure 4.6 Correlation between Per Capita GDP and Per Capita R&D Expenditure
- Figure 4.7 Ranks of 33 Indian Sub-national Economies across Environments in the Innovation Index
- Figure 4.8 Number of Patent Applications by Sub-national Economies (2020)

Tables

Chapter 2

- Table 2.1 Example to Compare the Shapley and Entropy Weights Methods
- Table 2.2 Overall Competitiveness Ranking and Scores for 36 Sub-national Economies of India (2023)
- Table 2.3 Macroeconomic Stability Ranking and Scores for 36 Sub-national Economies of India (2023)
- Table 2.4 Government and Institutional Setting Ranking and Scores for 36 Sub-national Economies of India (2023)
- Table 2.5 Financial, Businesses and Manpower Conditions Ranking and Scores for 36 Sub-national Economies of India (2023)
- Table 2.6 Quality of Life and Infrastructure Development Ranking and Scores for 36 Sub-national Economies of India (2020)
- Table 2.7 *What-if* Competitiveness Simulation Analysis on Overall Competitiveness for 36 Sub-national Economies of India (2020)
- Table 2.8 *What-if* Competitiveness Simulation Analysis on Macroeconomic Stability for 36 Sub-national Economies of India (2023)
- Table 2.9 *What-if* Competitiveness Simulation Analysis on Government and Institutional Setting for 36 Sub-national Economies of India (2023)
- Table 2.10 *What-if* Competitiveness Simulation Analysis on Financial, Businesses and Manpower Conditions for 36 Sub-national Economies of India (2023)
- Table 2.11 *What-if* Competitiveness Simulation Analysis on Quality of Life and Infrastructure Development for 36 Sub-national Economies of India (2023)
- Table 2.12 Overall Competitiveness Ranking – Comparison between Equal Weights and Shapley Weights Methodology (2023)
- Table 2.13 Overall Competitiveness Ranking for 36 Sub-national Economies of India (2013-2023)
- Table 2.14 Macroeconomic Stability Ranking for 36 Sub-national Economies of India (2013-2023)
- Table 2.15 Government and Institutional Setting Ranking for 36 Sub-national Economies of India (2013-2023)
- Table 2.16 Financial, Businesses and Manpower Conditions Ranking for 36 Sub-national Economies of India (2013-2023)
- Table 2.17 Quality of Life and Infrastructure Development Ranking for 36 Sub-national Economies of India (2013-2023)

Chapter 3

Table 3.1	Overall Competitiveness Ranking and Scores for Five Regions of India (2023)
Table 3.2	Macroeconomic Stability Competitiveness Ranking and Scores for Five Regions of India (2023)
Table 3.3	Government and Institutional Setting Competitiveness Ranking and Scores for Five Regions of India (2023)
Table 3.4	Financial, Businesses and Manpower Conditions Competitiveness Ranking and Scores for Five Regions of India (2023)
Table 3.5	Quality of Life and Infrastructure Development Competitiveness Ranking and Scores for Five Regions of India (2020)
Table 3.6	Top 20 Percent Strongest Indicators of Eastern Region (2020)
Table 3.7	Top 20 Percent Weakest Indicators of Eastern Region (2023)
Table 3.8	Top 20 Percent Strongest Indicators of Northern Region (2023)
Table 3.9	Top 20 Percent Weakest Indicators of Northern Region (2023)
Table 3.10	Top 20 Percent Strongest Indicators of North-eastern Region (2020)
Table 3.11	Top 20 Percent Weakest Indicators of North-eastern Region (2020)
Table 3.12	Top 20 Percent Strongest Indicators of Southern Region (2020)
Table 3.13	Top 20 Percent Weakest Indicators of Southern Region (2020)
Table 3.14	Top 20 Percent Strongest Indicators of Western Region (2020)
Table 3.15	Top 20 Percent Weakest Indicators of Western Region (2020)

Chapter 4

Table 4.1	Overall Innovation Index Ranking and Scores for 33 Sub-national Economies of India
-----------	--

Boxes**Chapter 3**

Box 3.1	Cross-year comparison for 5 Indian regions
---------	--

Chapter 4

Box 4.1	The Sub-national Evolution of the Startup Ecosystem in India
---------	--

List of Abbreviations

ACI	Asia Competitiveness Institute
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BE	Budget Estimate
CAD	Current Account Deficit
CAGR	Compound Annual Growth Rate
CGSS	Credit Guarantee Scheme for Startups
CII	Confederation of Indian Industry
CPI	Consumer Price Index
EU	European Union
FBMC	Financial, Businesses and Manpower Conditions
FDI	Foreign Direct Investment
FFS	Fund of Funds for Startups
FRAND	Fair Reasonable and Non-Discriminatory
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
GFCF	Gross Fixed Capital Formation
GIS	Government and Institutional Setting
GII	Global Innovation Index
GRDP	Gross Regional Domestic Product
GSDP	Gross State Domestic Product
GST	Goods and Services Tax
GVA	Gross Value Added
ICT	Information and Communication Technology
IMD	International Institute for Management and Development
IMF	International Monetary Fund
IP	Intellectual Property
IT	Information Technology
LKYSPP	Lee Kuan Yew School of Public Policy
LPG	Liquefied Petroleum Gas
MoSPI	Ministry of Statistics and Programme Implementation
MS	Macroeconomic Stability
MVIC	Maharashtra Virtual Incubation Center
NSO	National Statistics Office
NUS	National University of Singapore

PFCE	Private Final Consumption Expenditure
QLID	Quality of Life and Infrastructure Development
R&D	Research and Development
RBI	Reserve Bank of India
RE	Revised Estimate
SaaS	Software as a Service
SEZs	Special Economic Zones
SMEs	Small and Medium Enterprises
SSIP	Student Start-up & Innovation Policy
SVB	Silicon Valley Bank
UNCTAD	United Nations Conference on Trade and Development
US	United States
VC	Venture Capital
WCY	World Competitiveness Yearbook
WEF	World Economic Forum
WEO	World Economic Outlook
WIPO	World Intellectual Property Organisation

Chapter 1

Introduction

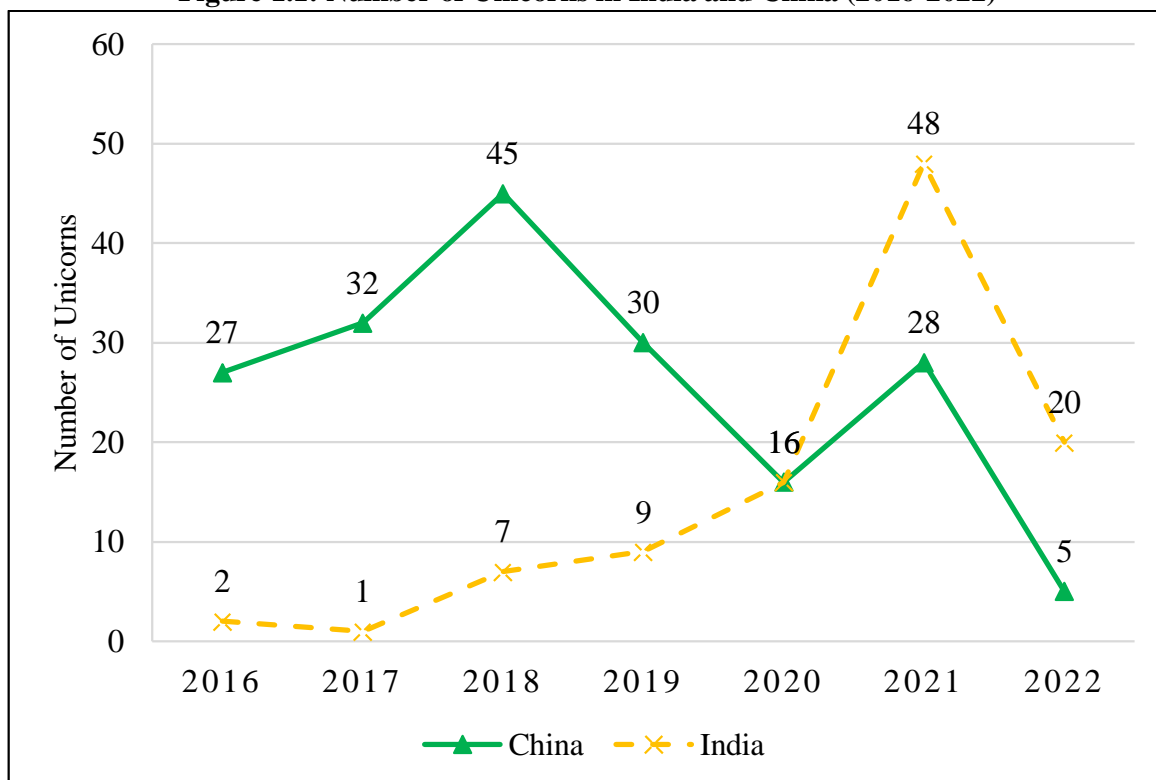
Akshaya Balaji

1.1 Introduction and Motivation

The year 2023 was a challenging one for startups worldwide. Most funding channels (especially Venture Capital (VC)), the lifeblood of new business entities, dried up at alarming rates. The reasons behind this downturn are multi-fold – elevated interest rates, plummeting technology stocks and declining valuations (Kilpatrick, 2023). Perhaps the incident that sent shockwaves through global tech was the Silicon Valley Bank (SVB) collapse, a bank (that had funded many startups) deeply intertwined in the intricate web of tech startups (Coulter, 2023). Investment in startups contracted by 38% year-on-year as investors became more risk averse (Teare, 2024). A natural consequence of this was a dramatic fall in startup creation; from 2020 to 2023 (forecasted figures), the number of new startups formed is on track to drop by a whopping 86% and 87% in the United States (US) and the European Union (EU) respectively (Sagie, 2023).

Despite the global downturn, India has managed to navigate these turbulent headwinds deftly and is largely unscathed. It attracted 5.6% of the global VC and is among the top five global markets (Global Data, 2024). Indian startups also raised more capital through public offerings than their global counterparts (Sharma Nariyanuri and Krishnamurthy, 2023). In addition, as of 2023, India's startup ecosystem is ranked third worldwide (Popli, 2023).

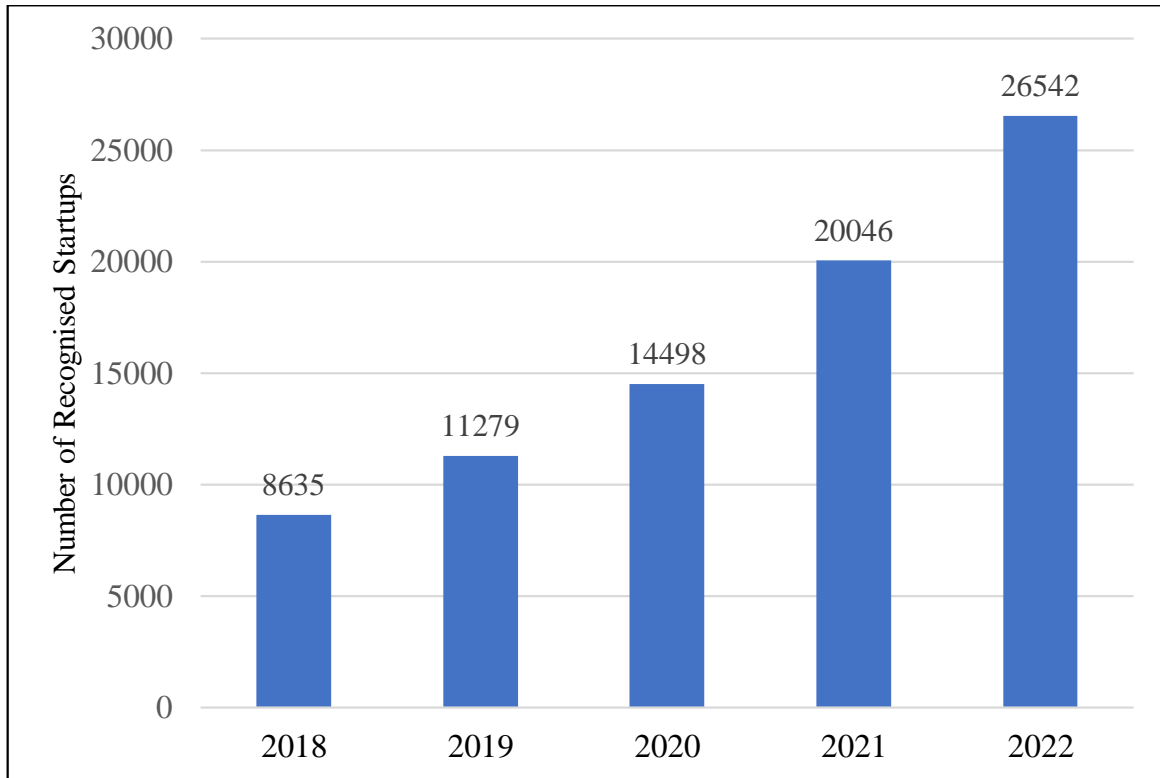
The buoyancy of India's startup ecosystem can be seen through the proliferation of startups and an elite subset of startups – unicorns (startup entities valued at over \$1 billion) throughout the country. First, Figure 1.1 shows how the number of unicorns in India began rising at an increasing rate from 2019 before outstripping China in 2020, a pivotal development for India's startup and innovation scene. The Indian government's heavy investment in infrastructure and investment-inclined policies and reforms have transformed the nation into the core of technology and manufacturing (Startup Genome, 2023). Regrettably, in 2022, the unicorn count decreased due to high inflation and interest rates, leading to cautious investor behaviour and limited capital infusion (Mamgain, 2023). Lastly, China's restrictive policies over long time periods have depressed economic growth, stifling the formation of unicorns and startups (Startup Genome, 2023).

Figure 1.1: Number of Unicorns in India and China (2016-2022)

Source: Asia Competitiveness Institute (ACI) based on data from Tracxn

Second, along similar lines, Figure 1.2 illustrates the rise of startups in India by approximately 18,000 entities from 2018 to 2022 since the launch of the government's Startup India Initiative in January 2016. This initiative contains expansive programs like the Fund of Funds for Startups (FFS) Scheme and the Credit Guarantee Scheme for Startups (CGSS) to ensure capital availability and provide credit guarantees for loans at early, seed, and growth stages. The initiative also covers vital aspects such as the relaxation of compliance burdens, tax rebates, intellectual property protection, and international market access via fruitful cross collaboration (Press Information Bureau, 2023a). In addition, the 2024-25 Interim Budget presentation on February 1, 2024 also saw promising schemes announced for Deep tech and bio startups (Press Information Bureau, 2024a). These measures complement various past provisions, demonstrating the government's commitment to fostering research, innovation, and encouraging startup activity.

Figure 1.2: Number of Recognised Startups in India since the launch of the Startup India Initiative, 2016

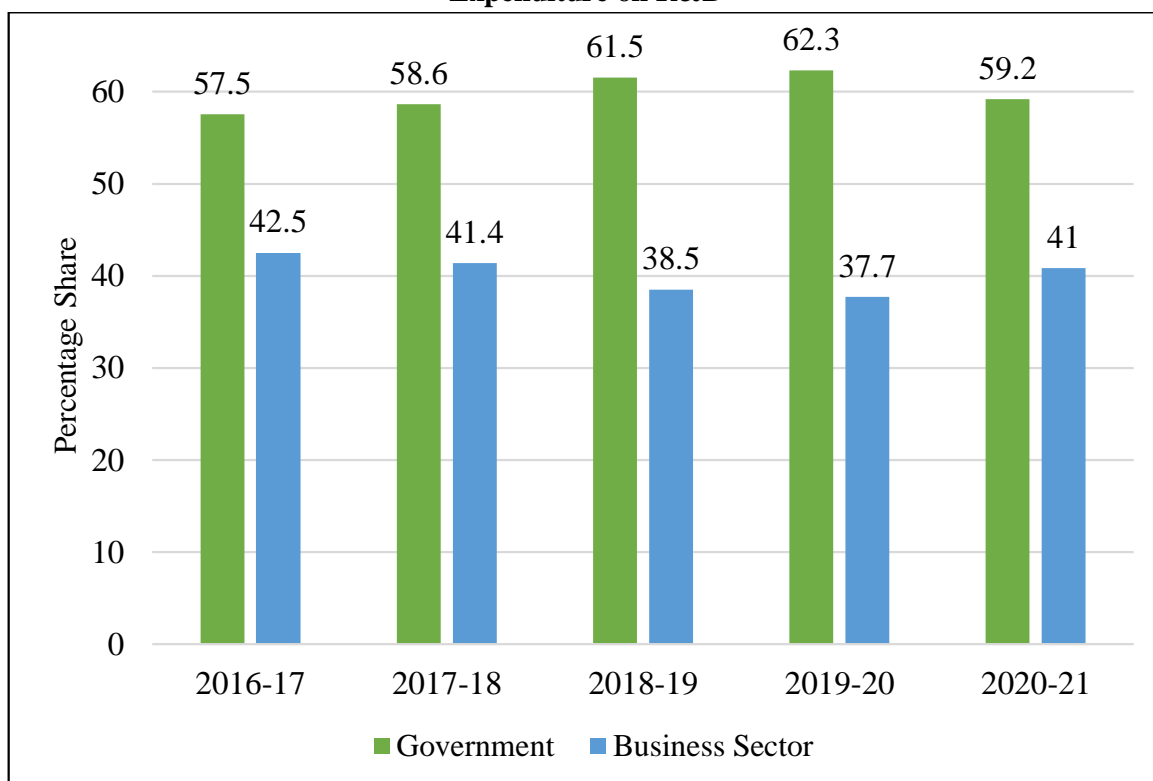


Source: ACI based on data from the Press Information Bureau, Government of India

Despite recent successes, there is scope for improvement, especially with regards India's Gross Expenditure on Research and Development (GERD) to enhance innovation capabilities and nurture startup activity further. Boosting the GERD is crucial for an emerging economy like India to transition from a net consumer to a net producer of knowledge (Economic Advisory Council to the PM, 2019). However, from 2009-10 to 2020-21, India's GERD dropped from around 0.8% to 0.6% of its Gross Domestic Product (GDP) (Department of Science and Technology, 2023). A major source of the decline is the diversion of resources from Research and Development (R&D) to tackle bigger challenges like poverty and hunger (JC, 2022).

A critical consideration is the extent of government and private sector participation in GERD. Figure 1.3 provides a breakdown of the percentage share of the government and private sector in GERD. Government spending surpasses that of the private sector across all years. Nevertheless, in 2020-21, the former reduced and the latter has risen, albeit marginally. Recognising the spending gap between the government and private entities, the 2020 draft of the Science, Technology, and Innovation Policy underscores the need to double the private sector's contribution within five years (Kumar, 2022). Taking this idea forward, the 2024-25 Interim Budget presentation included a statement that the private sector can access a Rs 1 lakh crore fund for R&D investments in sunrise sectors at minimal or no interest rates (Koshy, 2024).

Figure 1.3: Percentage Share of Government and Business Enterprise Sector in Gross Expenditure on R&D



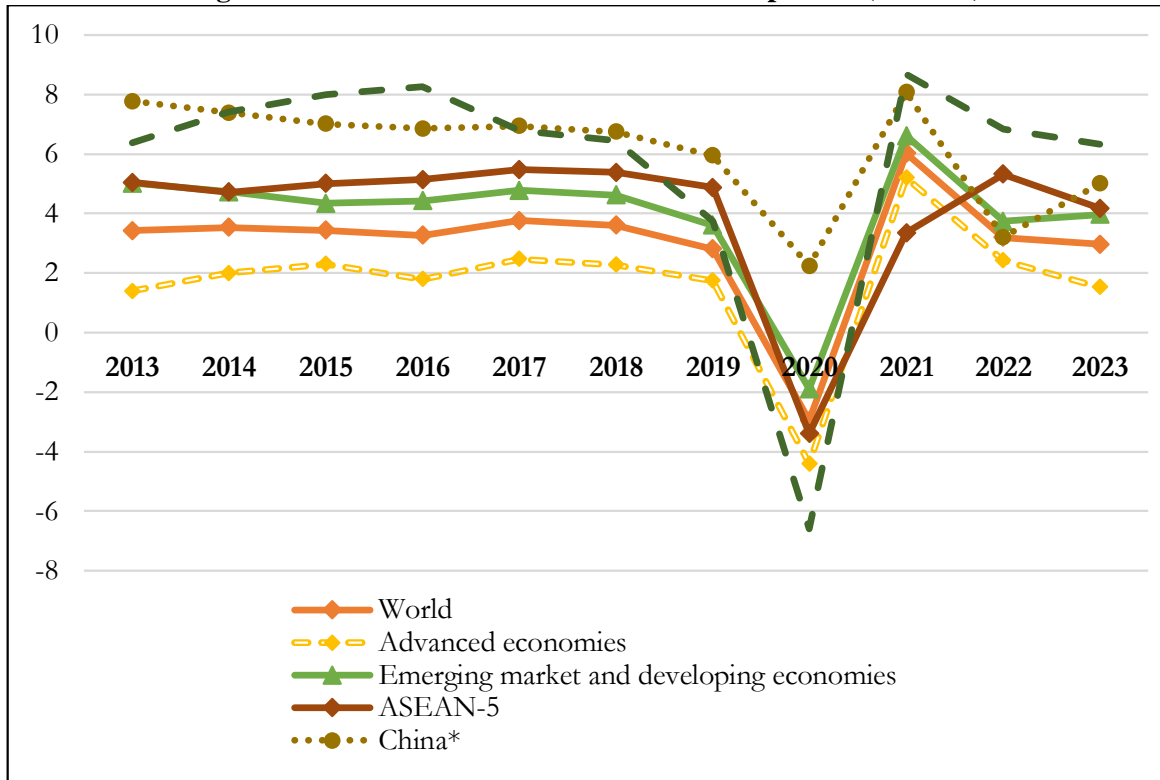
Source: ACI based on data from the Department of Science and Technology, Government of India

Given the above outline of the recent developments in India's innovation and startup landscape, the following Section 1.2 renders a discussion on India's performance on select macroeconomic indicators. Section 1.3 provides a rundown of the upcoming chapters of this book.

1.2 A Macroeconomic Overview of India's Economy

The pandemic was a punishing experience for India as for most countries. Significant economic contraction lowered consumer spending and investment that had to be rescued with colossal government stimulus packages. This sent the fiscal deficit spiralling into dangerous territory. However, India weathered the pandemic and continues to remain largely buoyant amidst tricky geopolitics and global supply chain destabilisation (Vaid et al. 2023). Now, India's growth rate and projections are strong, inflation rates have moderated and domestic consumption has swelled. Also, the fiscal deficit and the Current Account Deficit (CAD) are adequately tamed, and a magnificent rise in Foreign Direct Investment (FDI) into the technology and innovation sector has been observed.

This section presents an overview of the key macroeconomic indicators for India, and wherever necessary, it is also viewed through the perspective of other countries and regions.

Figure 1.4: India's Real GDP Growth in Perspective (Percent)

Note: ASEAN-5 refers to Indonesia, Malaysia, Philippines, Thailand and Vietnam

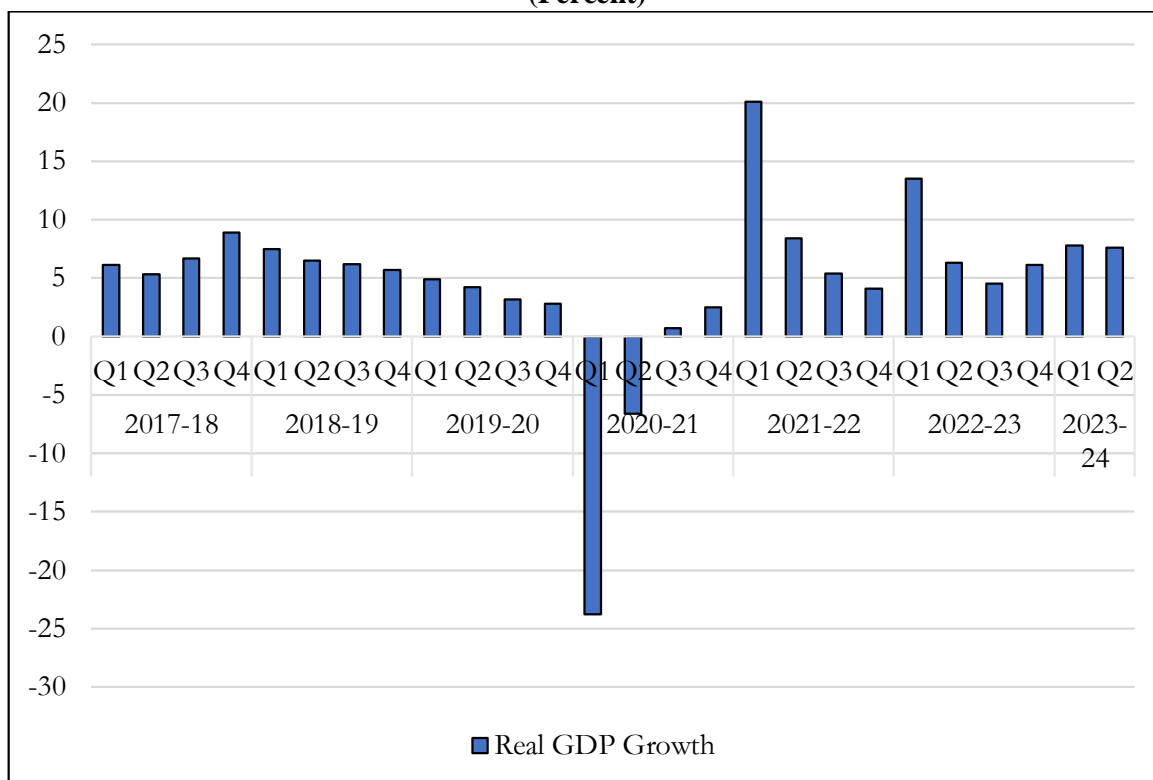
*China's real GDP growth in 2023 is an estimate.

Source: ACI based on data from the International Monetary Fund (IMF), World Economic Outlook (WEO).

Riding on the back of resilient domestic demand, the International Monetary Fund (IMF) raised India's real GDP growth projection to 6.5% in 2024, a 0.2 percentage increase from October 2023 (IMF, 2024; IMF, n.d.) (see Figure 1.4). Further, based on the First Advance Estimates of National Income released by the National Statistics Office (NSO), India's economy is poised to grow by 7.3% in FY2023-24 (Press Information Bureau, 2024b). Burgeoning domestic demand, robust investment in public infrastructure, and a buoyant financial sector are major contributors to this optimistic estimate (World Bank, 2023).

The IMF's World Economic Outlook (WEO) Update of January 2024 strikes a relatively hopeful tone than its October 2023 WEO report. The latter explained how tepid manufacturing activity among the advanced economies pulled down global average economic growth in 2023 (IMF, 2023) (see Figure 1.4). However, the IMF predicts that in 2024, a positive growth outlook in the US partially overshadowed by a moderately weak growth expected across Europe will render the advanced economies growing 0.1 percentage point higher in 2024 (IMF, 2024). Next, due to the Chinese government's proactive involvement in boosting the country's resistance to natural disasters and heightened government spending, China's economy is expected to rise to 5.01% this year (IMF, 2024).

Figure 1.5: Quarterly Real GDP Growth (Change over Same Quarter Previous Year) (Percent)



Source: ACI based on data from the Ministry of Statistics and Programme Implementation (MoSPI)

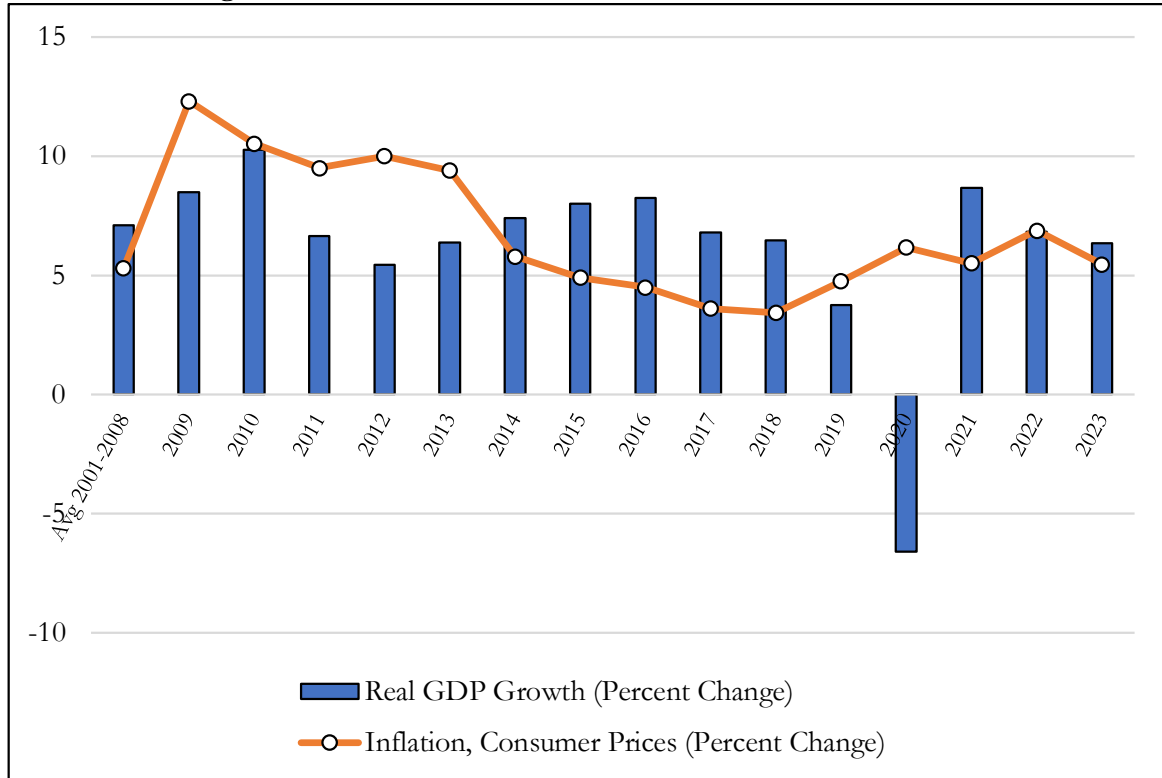
After a plunge into negative figures in early 2020-21, India's quarterly growth has been positive. For the first two quarters of FY2023-24, the figures stand at 7.8% and 7.6% respectively (Press Information Bureau, 2023b) (see Figure 1.5). The moderately higher growth rate from Q4 FY2022-23 to Q1 FY2023-24 comes amidst a reasonably high performance from most non-agricultural sectors. However, for the latter half of FY2023-24, expected growth comes with a tinge of pessimism due to depressed global growth and a feeble outlook for agricultural output and rural demand. Besides, a possible reduction in government capital expenditure as the 2024 General Elections draw close also adds to the anticipated slowdown (Business Today, 2023).

Another contributor to the slight decline in growth rates in Q2 FY2023-24 is the transmission of the effects of the Reserve Bank of India's (RBI) past monetary tightening efforts, an exercise carried out to curb inflationary pressures, which raises borrowing costs (Business Today, 2023). This ultimately weakens economic growth, as seen in Figure 1.5. From May 2022 to early February 2023, the Central Bank had repeatedly raised its key repo rate before settling at 6.5% (Bhat and Ganguly, 2023; Trading Economics, n.d.).

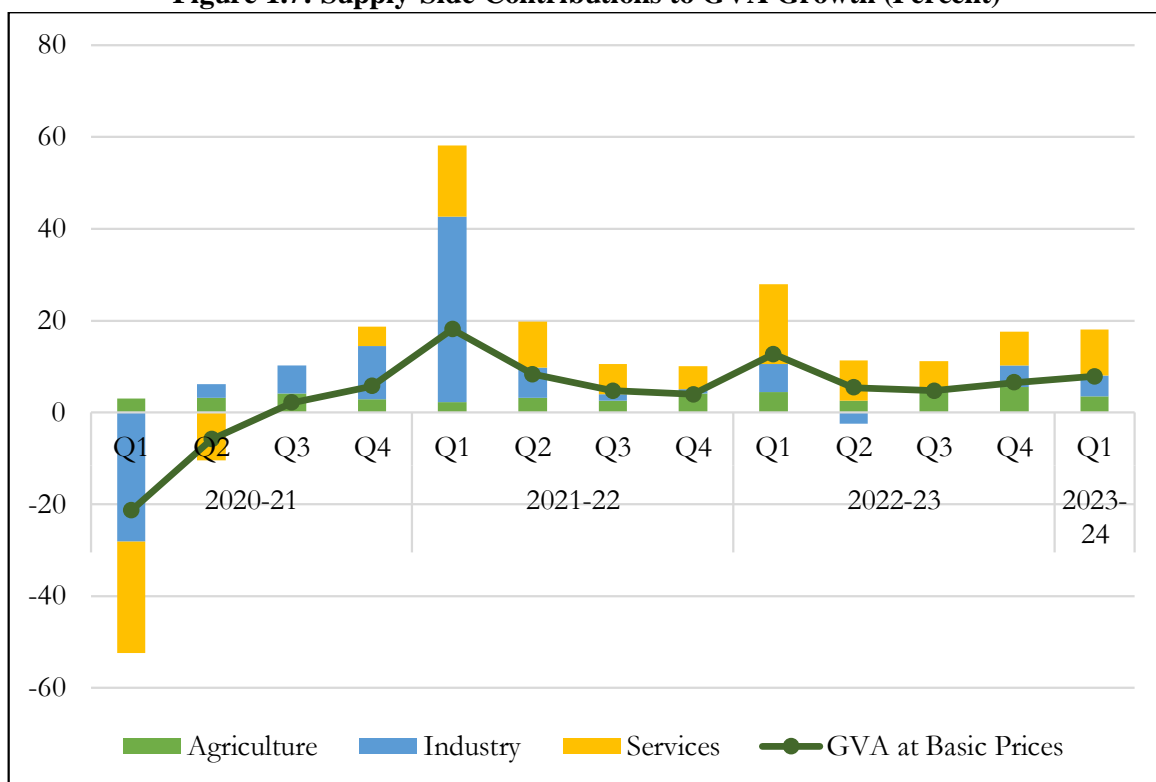
These interest rate hikes have helped moderate the inflation rate from 2022 to 2023 (see Figure 1.6). In addition to the impact of rate hikes, two significant factors played a pivotal role in dampening Consumer Price Index (CPI) inflation rates in 2023. Firstly, the relaxation in the fuel and light sub-index (due to a decline in global oil prices) enabled the government to provide subsidies on Liquefied Petroleum Gas (LPG) cylinders, resulting in reduced households' fuel

expenditures. Secondly, a notable decline in vegetable prices markedly reduced the food and beverages sub-index, resulting in a more affordable food market (Biswas, 2023a).

Figure 1.6: Annual Real GDP Growth and Inflation (Percent)



Source: ACI based on data from IMF, WEO

Figure 1.7: Supply-Side Contributions to GVA Growth (Percent)

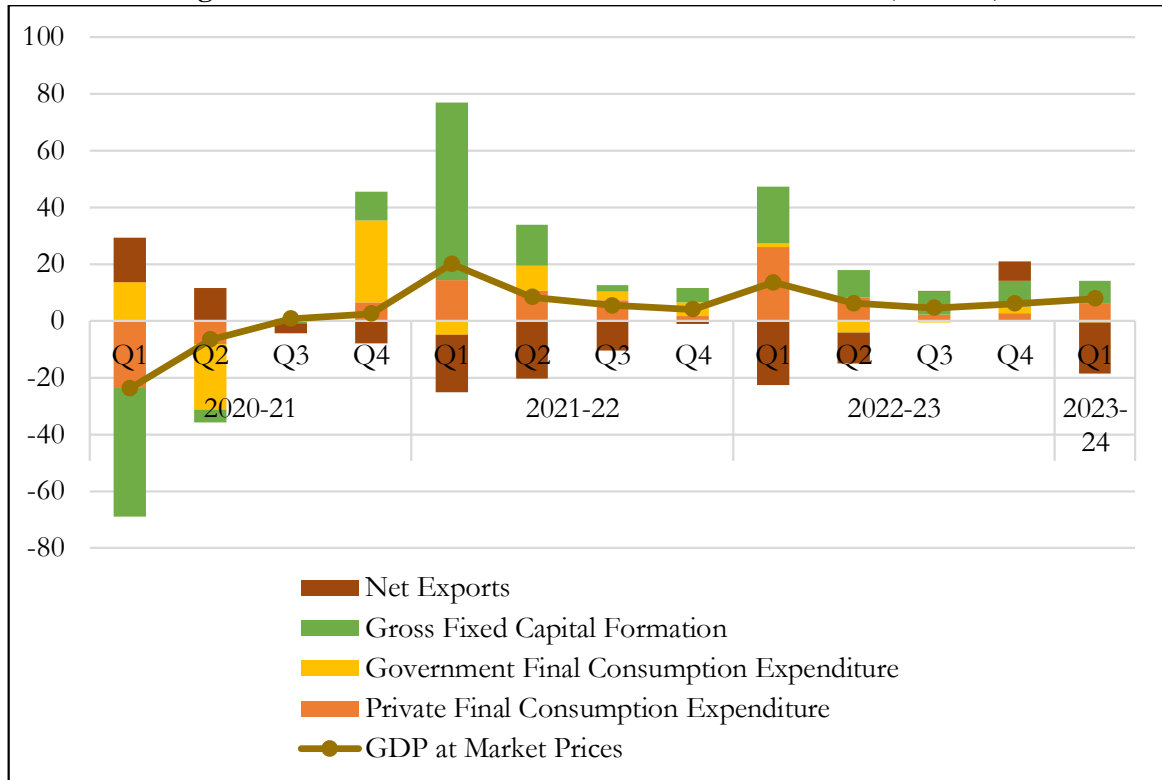
Source: ACI based on data from Reserve Bank of India (RBI)

Now that India's overall economic growth specifics have been dealt with, we dive deeper to ascertain the key drivers of such economic growth by breaking down the supply- and demand-side contributors.

On the supply side (see Figure 1.7), after a sharp downturn post Q1 FY2022-23, Gross Value Added (GVA) has consistently risen over the quarters and is at 7.8% in Q1 FY2023-24. The agricultural sector grew consistently till Q4 FY2022-23, thanks to record-breaking production of foodgrains (RBI, 2023a). Unfortunately, irregular rainfall patterns in June-September 2023 depressed agricultural growth numbers in Q1 FY2023-24 (RBI, 2023b).

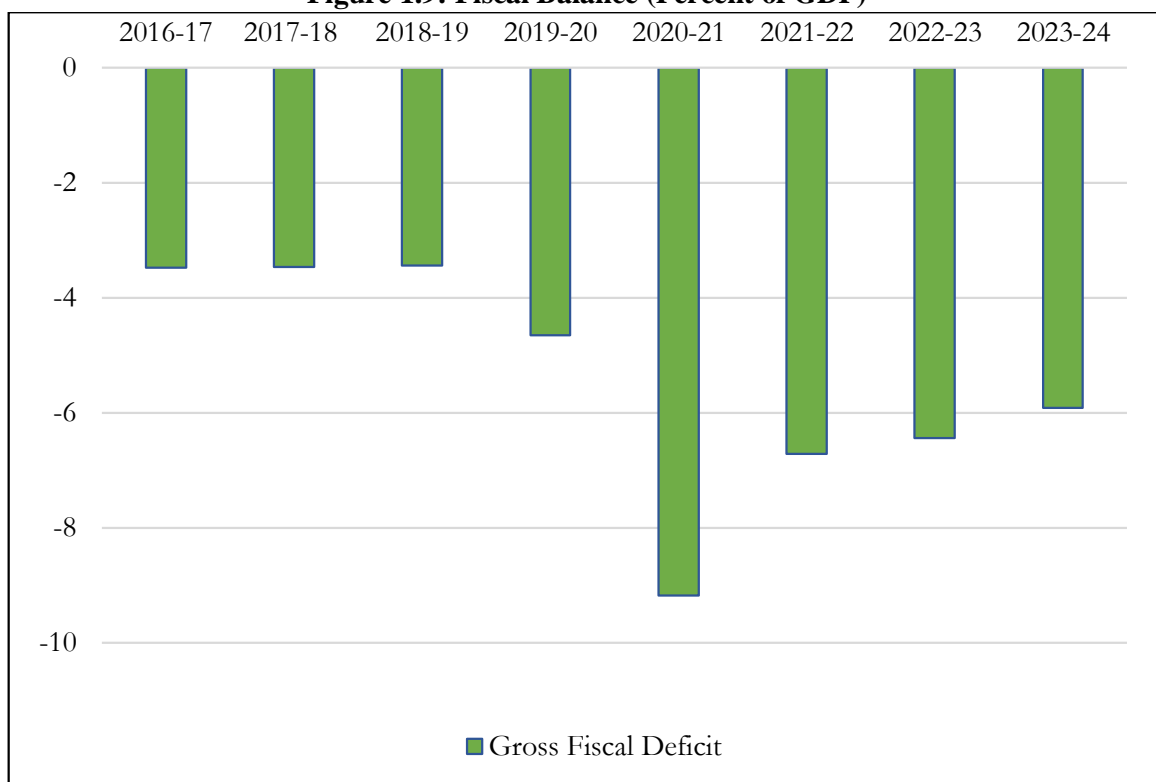
The industrial sector's growth trajectory has been worrisome, having fallen prey to supply chain inconsistencies and sky-high input prices in (RBI, 2022). Fortunately, since Q3 FY2022-23, industrial activity has expanded, thanks to a boost in mining activity, and judicious growth in electricity, gas and water supply (RBI, 2023a). Further, in Q1 2023-24, industrial sector GVA has been accelerated by high manufacturing activity due to easing pressure from dipping input costs and the stabilisation of supply chains (RBI, 2023b).

Finally, service sector growth has remained robust, underpinned by consistent growth in construction activity, real estate, contact-intensive and financial services (RBI, 2023b).

Figure 1.8: Demand-Side Contribution to GDP Growth (Percent)

Source: ACI based on data from RBI

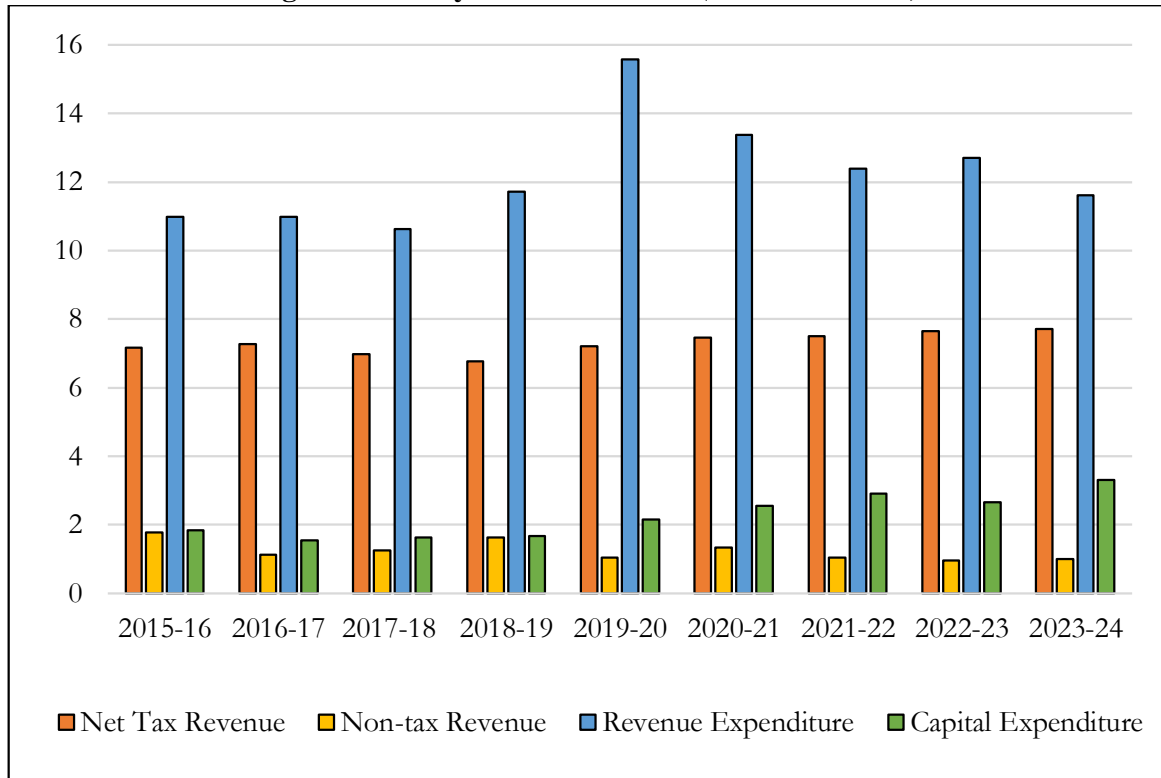
On the demand side (see Figure 1.8), high inflation woes and the COVID-19 aftermath depressed private final consumption expenditure (PFCE) from Q2 FY2022-23 to January 2023. Spending on consumer durables was greatly hit, suggesting a shift in household spending from goods to services as the pandemic withdrew (RBI, 2023a). However, the revealed inclination of consumers towards passenger vehicles and domestic flying pulled up the PFCE in Q1 FY2023-24 (RBI, 2023a). Next, the government's emphasis on infrastructure spending and construction activity boosted cement production and steel consumption in Q3 and Q4 FY2022-23, greatly accelerating the Gross Fixed Capital Formation (GFCF) (RBI, 2023a). The continued importance given to qualitative improvement in central government spending decelerated government consumption in Q1 FY2023-24 (RBI, 2023b). Finally, net exports contracted in Q1 FY2023-24 amidst geoeconomic divisions, enduring geopolitical tensions and global economic slowdown (RBI, 2023b).

Figure 1.9: Fiscal Balance (Percent of GDP)

Note: Data for 2022-23 – Revised Estimates; Data for 2023-24 – Budget Estimates

Source: ACI based on data from RBI

We now consider India's performance across important fiscal indicators to ascertain the financial soundness of the government. A monumental rise in gross fiscal deficit in FY2020-21 resulted from heightened government spending on stimulus packages and shortfalls in non-tax revenue and disinvestment receipts (The Hindu, 2021) (see Figure 1.9). However, the fiscal deficit has narrowed since then, a trend attributed to expanding tax and non-tax collections (Upasani, 2024). The budget estimate for FY2023-24 was at 5.9%. For FY2024-25, the government has taken on a more aggressive fiscal consolidation approach by targeting a fiscal deficit of 5.1% (Sanyal and Jacob, 2024). Further, due to a healthy trend in revenue mobilisation, the revised estimate (RE) for FY2023-24 is pegged at 5.8%, well ahead of the budget estimate (BE) of 5.9% (Sanyal and Jacob, 2024). Figure 1.10 offers a closer look at the elements making up the fiscal deficit. The declining revenue expenditure (mainly by containing subsidies) and higher capital expenditure budgeted for FY2023-24 is part of the government's pursuit of fiscal consolidation. Tax revenues have been robust, with higher Goods and Services Tax (GST) collections and direct tax due to greater tax compliance and healthy economic activity (RBI, 2023b). However, non-tax revenues have been low since FY2022-23 as dividends and profits nosedived (RBI, 2023b).

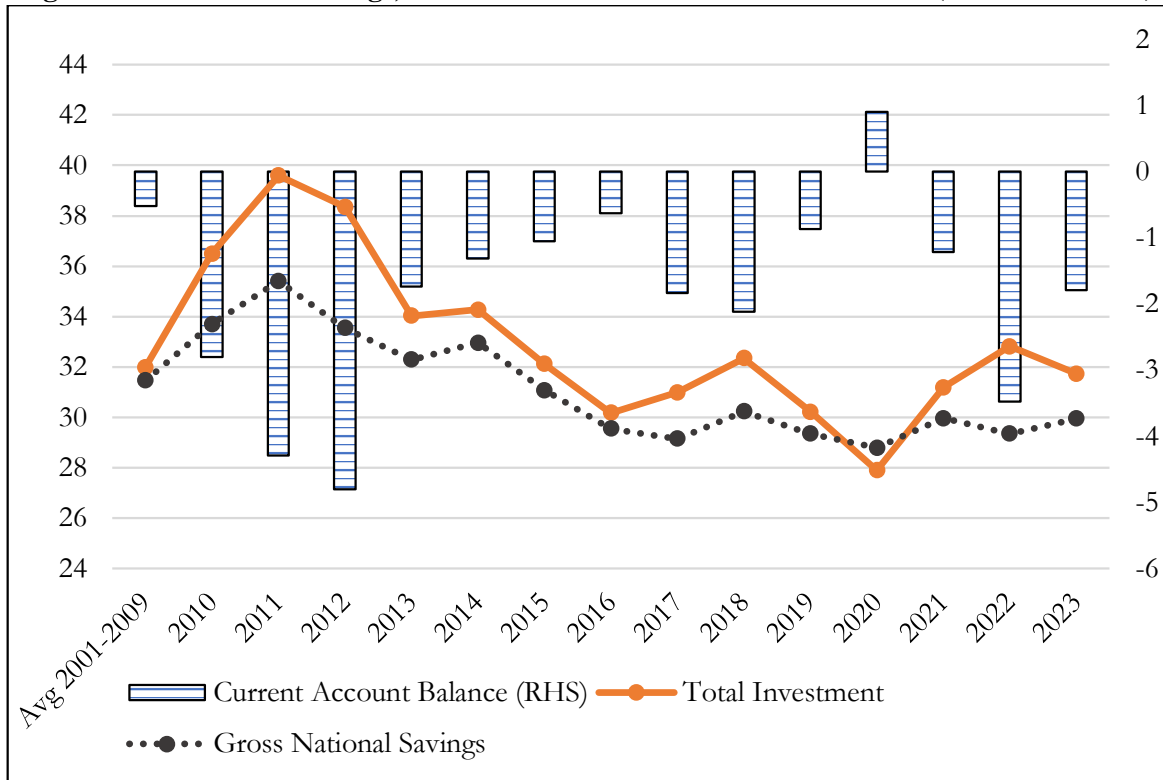
Figure 1.10: Key Fiscal Indicators (Percent of GDP)

Note: Data for 2022-23 – Revised Estimates; Data for 2023-24 – Budget Estimates

Source: ACI based on data from RBI

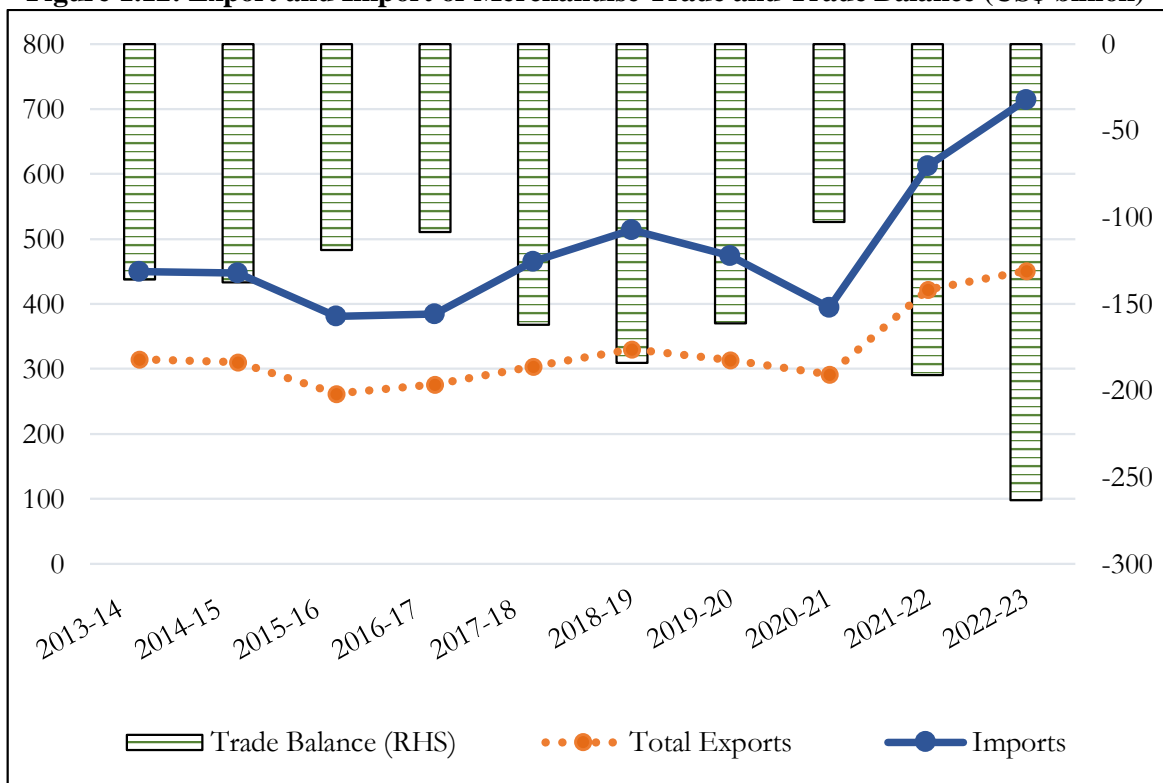
Given the quick glance at India's fiscal particulars, we proceed to describing the state of India's savings, investment and CAD, illustrated in Figure 1.11. The challenging economic landscape faced by India in 2020 due to the impact of the coronavirus pandemic has given way to brighter prospects, with a positive trajectory observed since 2021. A high number of government infrastructure and public-works projects uplifted total investments (The Hindu, 2024). Savings rose at the wake of the pandemic but as India's largely successful vaccination program gradually dispelled fears of the virus, Indians have embarked on a slight spending spree (Mukherjee and Kumar Arora, 2023) (see Figure 1.11). India's CAD has also taken a favourable turn, thanks to healthy services exports, high inflows of private transfers (majorly remittances) and non-resident deposits, and a drop in oil prices (Roy, 2023). Figure 1.12 presents India's trade balance, augmenting the discussion on CAD.

Figure 1.11: National Savings, Investment and Current Account Deficit (Percent of GDP)



Source: ACI based on data from IMF, WEO

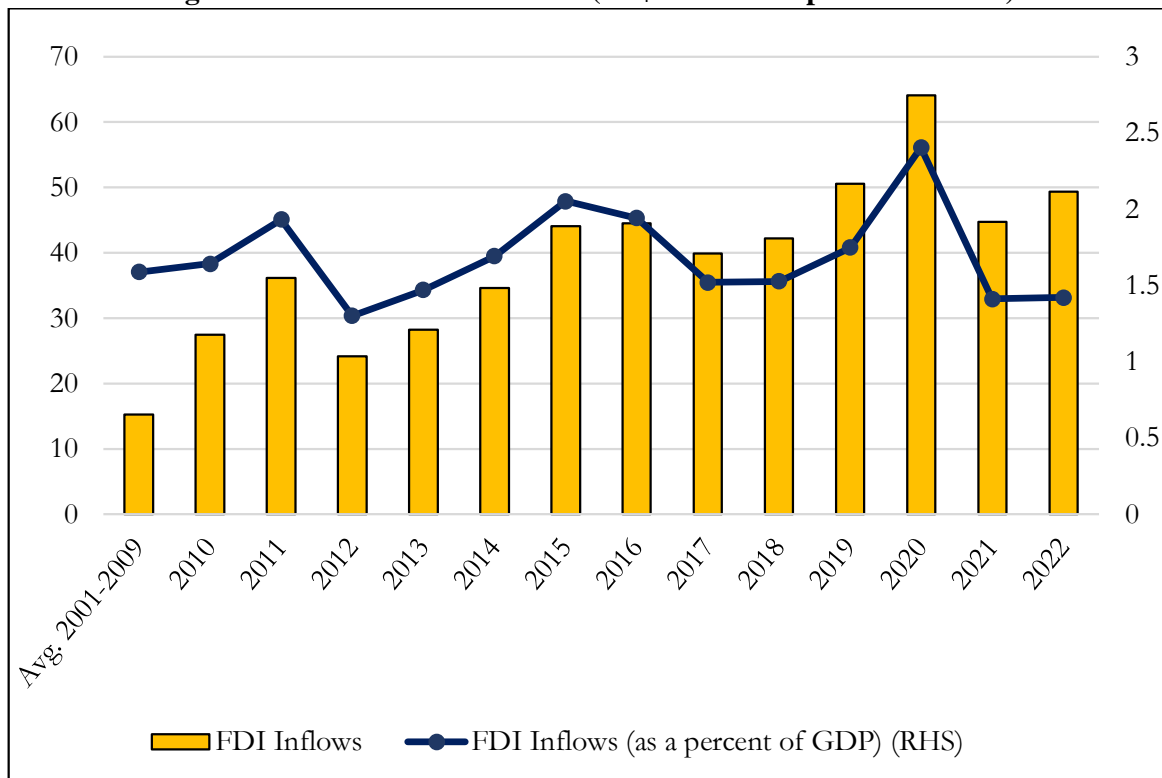
Figure 1.12: Export and Import of Merchandise Trade and Trade Balance (US\$ billion)



Source: ACI based on data from RBI

In FY2023-24, India's trade balance and exports have been hit by rocky geopolitics and an overall economic slowdown across developed nations. The latter has given rise to weakening global demand, as perceived by the imports outstripping exports in Figure 1.12. India has maintained a trade deficit with nine out of its ten trading partners, two of which have arisen due to petroleum imports from Russia and edible oil from Indonesia (The Wire, 2024). As far as exports are concerned, India's merchandise exports dipped, but alleviated by a robust growth in services exports, improving the CAD as aforementioned (Biswas, 2023b).

Figure 1.13: FDI Inflows to India (US\$ billion and percent of GDP)



Source: ACI based on data from United Nations Conference on Trade and Development (UNCTAD)

A rapid expansion of the domestic consumer market has made India a hotbed for FDI, as seen by the rise in FDI inflows in 2022 in Figure 1.13 (Biswas, 2023b). This has helped assuage the stresses on the country's external account, improving the CAD (see Figure 1.11). As such, India's focus on enhancing its startup ecosystem (via tax benefits and incentives to start-ups) has enabled the technology and innovation sector to attract a large magnitude of foreign investment. Another key enabler is simplified bureaucratic procedures like the single-window clearance that has accelerated the ease of doing business in the country (Forbes India, 2023). As per the RBI, the top five sources of FDI inflow to India comprise Singapore, Japan, Netherlands, the US and Mauritius (RBI, 2023b).

1.3 Roadmap of the Book

This book, *Innovative India: A Sub-national Competitiveness Analysis*, is the eleventh edition of ACI's competitive analysis of India's sub-national economies. The focus of the upcoming chapters – Chapters 2 and 3, is the competitiveness analysis at the sub-national and regional levels, respectively. The chapters begin by laying out the motivation for this analysis followed by a technical explanation of ACI's competitiveness framework methodology.

Chapter 2 also offers a thorough description of the Shapely Weights methodology, which helps get rid of subjectivity from weight assessment by easing the assumption of equal weights and by assigning Shapely values – a widely used idea in cooperative game theory. This method bolsters the objectivity and robustness of our research findings, given its basis in concrete mathematical and theoretical foundations.

Our research also incorporates the *What-if* simulation analysis, also explained in Chapter 2. This simulation adds more body to our research by providing insights into the strengths and weaknesses of each region and sub-national economy. More precisely, it addresses the question of how a sub-national economy can recover if, *ceteris paribus*, 20% of its weakest-performing indicators were elevated to the national average. Given that the sub-national economies can improve their performance by adopting pertinent policy recommendations, the simulation provides a heads-up to the top sub-national economies to be wary of competition. Supplementing the competitiveness rankings and score analysis, Chapter 3 offers a discussion of the top 20% of each region's strongest and weakest indicators.

Lastly, in Chapter 4, we study the innovation competitiveness of India's sub-national economies using ACI's Innovation Index Framework that comprises four broad environments – R&D, human capital, international connectivity and governance. It also presents a case study of India's startup ecosystem, the top regions and sub-national economies driving startup growth in recent times and the policies boosting the Indian startup culture.

References

- Bhat, Swati, and Sudipto Ganguly. "India Pauses Rate Hikes in Surprise Decision, but Door Open for More." Reuters, April 6, 2023. <https://www.reuters.com/world/india/india-holds-key-rate-surprise-decision-keeps-door-open-more-hikes-2023-04-06/>.
- Biswas, Rajiv. "India's Rapid Growth Continues as Inflation Pressures Ease Further." S&P Global Market Intelligence, November 17, 2023a. <https://www.spglobal.com/marketintelligence/en/mi/research-analysis/indias-rapid-growth-continues-as-inflation-pressures-ease-further-nov23.html>.
- . December 8, 2023b. "India Seizes Crown of Fastest Growing G20 Economy." <https://www.spglobal.com/marketintelligence/en/mi/research-analysis/india-seizes-crown-of-fastest-growing-g20-economy-dec23.html>.
- Business Today. "India's GDP Grows 7.6% in Q2FY24 vs 7.8% in Q1FY24." November 30, 2023. <https://www.businesstoday.in/latest/economy/story/indias-gdp-growth-accelerates-to-76-in-q2fy24-407765-2023-11-30>.

- Coulter, Martin. “How Silicon Valley Bank’s Collapse Ripped through Global Tech.” Reuters, March 14, 2023. <https://www.reuters.com/markets/how-silicon-valley-banks-collapse-ripped-through-global-tech-2023-03-13/>.
- Ministry of Science and Technology - Government of India. “Research & Development Statistics at a Glance, 2022-23.” New Delhi, India: Department of Science and Technology, March 2023. <https://dst.gov.in/sites/default/files/R%26D%20Statistics%20at%20a%20Glance%2C%202022-23.pdf>.
- Economic Advisory Council to the Prime Minister - Government of India. “R&D Expenditure Ecosystem: Current Status and Way Forward.” July 2019. https://psa.gov.in/CMS/web/sites/default/files/publication/1571900991_R%26D%20book%20expenditure%20ecosystem.pdf.
- Forbes India. “Foreign Direct Investment (FDI) in India: Inflows in 2023 and Last 10 Years,” November 9, 2023. <https://www.forbesindia.com/article/explainers/fdi-in-india-inflows/89609/1>.
- Global Data. “VC Funding in India down by More than Half to \$7.8 Billion in 2023, Finds GlobalData,” January 19, 2024. <https://www.globaldata.com/media/business-fundamentals/vc-funding-india-half-7-8-billion-2023-finds-globaldata/#:~:text=India%20accounted%20for%20a%205.6,deal%20value%20stood%20at%203.3%25>.
- International Monetary Fund. “India and the IMF,” n.d. <https://www.imf.org/en/Countries/IND>.
- International Monetary Fund. “World Economic Outlook - Navigating Global Divergences.” Washington DC, United States of America: International Monetary Fund, October 2023. <https://www.imf.org/en/Publications/WEO/Issues/2023/10/10/world-economic-outlook-october-2023>.
- . January 2024. “World Economic Outlook Update - Moderating Inflation and Steady Growth Open Path to Soft Landing.” <https://www.imf.org/en/Publications/WEO/Issues/2024/01/30/world-economic-outlook-update-january-2024>.
- International Monetary Fund. “World Economic Outlook Database,” n.d. <https://www.imf.org/en/Publications/WEO/weo-database/2023/October>
- JC, Anand. “India R&D News: India’s R&D Spends amongst the Lowest in the World: NITI Aayog Study.” The Economic Times, July 21, 2022. <https://economictimes.indiatimes.com/news/india/indias-rd-spends-amongst-the-lowest-in-the-world-niti-aayog-study/articleshow/93024586.cms?from=mdr>.
- Koshy, Jacob. “Government Moots ₹1 Lakh-Crore Corpus for Research and Development in Interim Budget.” The Hindu, February 1, 2024. <https://www.thehindu.com/business/budget/budget-2024-government-moots-1-lakh-crore-corpus-for-research-and-development/article67801435.ece>.
- Kumar, Omir. “Demand for Grants 2022-23 Analysis : Science and Technology.” PRS Legislative Research, February 14, 2022. <https://prsindia.org/budgets/parliament/demand-for-grants-2022-23-analysis-science-and-technology>.
- Mamgain, Pramugdha. “India Unicorn Fundraising Dropped 76% in January-June 2023.” Nikkei Asia, August 18, 2023. <https://asia.nikkei.com/Spotlight/DealStreetAsia/India-unicorn-fundraising-dropped-76-in-January-June-2023>.

- Ministry of Statistics and Programme Implementation - Government of India. "DataViz - Quarterly GDP Growth Rates," n.d. <https://www.mospi.gov.in/dataviz-quarterly-gdp-growth-rates>.
- Mukherjee, Jaydeep, and Puneet Kumar Arora. "India Cannot Afford to Let Its Savings Rate Keep Slipping." *Nikkei Asia*, November 10, 2023. <https://asia.nikkei.com/Opinion/India-cannot-afford-to-let-its-savings-rate-keep-slipping>.
- Popli, Manah. "Investment Outlook for India's Startup Ecosystem in 2023." *India Briefing*, September 28, 2023. <https://www.india-briefing.com/news/investment-outlook-for-indias-startup-ecosystem-in-2023-29731.html/#:~:text=India's%20startup%20ecosystem%2C%20ranking%20third,with%20a%20bright%20future%20ahead>.
- Press Information Bureau - Government of India. "More than 92,000 Entities Recognized as Startups since Launch of Startup India," April 5, 2023a. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1913977#:~:text=Since%20the%20Launch%20of%20Startup,on%2028th%20February%202023>.
- . 30 November, 2023b. "Estimates of Gross Domestic Product for the Second Quarter (July-September) of 2023-24." <https://pib.gov.in/PressReleasePage.aspx?PRID=1981170>.
- . 1 February, 2024a. "Interim Budget 2024-25 Reflects the Emphasis on Innovation and Startups to Achieve the Goal of a Viksit Bharat @2047, Says Union S&T Minister Dr Jitendra Singh." <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2001591>.
- . 5 January, 2024b. "First Advance Estimates of National Income, 2023-24." <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1993550>.
- Reserve Bank of India. "Monetary Policy Report – September 2022," September 30, 2022. <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=21343#31>.
- . 6 April, 2023a. "Monetary Policy Report - April 2023." <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=21753#CP31>.
- . 6 October, 2023b. "Monetary Policy Report - October 2023." <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22050#C39>.
- Roy, Anup. "India Current Account Deficit Narrows in July-September Quarter 2023." *Bloomberg*, December 26, 2023. <https://www.bloomberg.com/news/articles/2023-12-26/india-s-current-account-gap-narrows-in-july-september-quarter>.
- Sagie, Itay. "Alarming Decline In Startup Creation Presents Challenges And Opportunities For Entrepreneurs." *Crunch Base*, July 24, 2023. <https://news.crunchbase.com/venture/startup-creation-challenges-opportunities-charts-sagie/#clarification>.
- Sanyal, Shreyashi, and Charmaine Jacob. "India Expects Fiscal Deficit for 2025 to Narrow to 5.1% Even as It Boosts Infra Spending." *CNBC*, February 1, 2024. <https://www.cnbc.com/2024/02/01/india-interim-budget-nirmala-sitharaman-on-economy-investments.html>.
- Sharma Nariyanuri, Sampath, and Shankar Krishnamurthy. "Startups Riding Digital Infrastructure Could Transform Indian Economy." *S&P Global*, August 3, 2023. <https://www.spglobal.com/en/research-insights/featured/special-editorial/look-forward/startups-riding-digital-infrastructure-could-transform-indian-economy>.
- Startup Genome (Jun. 2023). *The Global Startup Ecosystem Report 2023*. URL: <https://startupgenome.com/report/gser2023>

- Teare, Gené. “Global Startup Funding In 2023 Clocks In At Lowest Level In 5 Years.” Crunch Base, January 4, 2024. <https://news.crunchbase.com/venture/global-funding-data-analysis-ai-eoy-2023/>.
- The Hindu. “India’s Fiscal Deficit in 2020-21 Lower than Expected,” May 31, 2021. <https://www.thehindu.com/business/Economy/fiscal-deficit-for-2020-21-at-93-of-gdp-cga/article34690014.ece>.
- . January 5, 2024. “India Registered Strong Investment Performance in 2023; Headwinds in China from Struggling Property Sector: UN.” <https://www.thehindu.com/news/international/india-registered-strong-investment-performance-in-2023-headwinds-in-china-from-struggling-property-sector-un/article67708934.ece>.
- The Wire. “India Records Trade Deficit With Nine Top Trading Partners in April-October FY24: Report,” January 1, 2024. <https://thewire.in/trade/india-records-trade-deficit-with-nine-top-trading-partners-in-april-october-fy24-report>.
- Tracxn. “Unicorn Club > Unicorn Club Overview Database,” n.d. <https://tracxn.com/a/s/query/t/unicornCorner/t/overview>
- Trading Economics. “India Interest Rate,” n.d. <https://tradingeconomics.com/india/interest-rate>.
- UNCTAD Stat. “Data centre Database,” n.d. <https://unctadstat.unctad.org/datacentre/>
- Upasani, Siddharth. “India’s April-December Fiscal Deficit at Rs 9.82 Lakh Crore, 55% of FY24 Target.” Moneycontrol, January 31, 2024. <https://www.moneycontrol.com/news/business/budget/indias-april-december-fiscal-deficit-at-rs-9-82-lakh-crore-55-of-fy24-target-12162261.html><https://www.moneycontrol.com/news/business/budget/indias-april-december-fiscal-deficit-at-rs-9-82-lakh-crore-55-of-fy24-target-12162261.html>.
- World Bank. “India’s Growth to Remain Resilient Despite Global Challenges,” October 3, 2023. <https://www.worldbank.org/en/news/press-release/2023/10/03/india-s-growth-to-remain-resilient-despite-global-challenges>.
- Zhang, Xuyao, and Rohanshi Vaid, eds. *India and the Digital Economy: A Sub-national Competitiveness Analysis of India*. Singapore: Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore, 2023. ISBN: 978-981-18-6784-2