Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma Thesis

New Approach to Economic Development in Developing Countries: Case Study of India - Kerala State

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New approach to Economic Development in Developing Countries: Case Study of India – Kerala state

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Objectives of thesis

This diploma thesis addresses the ways of reaching a new way of accelerating the rate of economic development of India, one of the world's fastest growing economies still suffering from a series of obstacles for viable economic development. The thesis seeks to understand the current state of economic development and provides recommendations on how to improve the current situation. As an extention to the original research objective, the thesis equally puts emphasis on the state of Kerala. The thesis provides an overview of the following sectors as an extension: agriculture, healthcare and education.

Methodology

The diploma thesis uses both qualitative and quantitative methods. The qualitative methods are used in the literature review, and the quantitative ones are used in the empirical part of the work. Both parts draw on the secondary data obtained from IMF, The World Bank and the National Statistical Office of India. The quantitative analysis is represented by time series, descriptive and correlation analyses.

The proposed extent of the thesis

60-80 pages

Keywords

India, developing country, development, economic growth, inequality

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Declaration

I declare that I have worked on my diploma thesis titled "New Approach to Economic Development in Developing Countries: Case Study of India – Kerala State" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break any copyrights.

In Prague on 31.03.2025 _____

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New Approach to Economic Development in Developing Countries: Case Study of India - Kerala State

Abstract

This diploma thesis reviews the economic development of Kerala State in India, its peculiar "Kerala Model," and investments in health, education, and social welfare. The research seeks to define development in recent literature, analyze Kerala's economic trajectory, and highlight strategies for overcoming the continuing challenges. Using qualitative and quantitative approaches, such as time series, descriptive, and regression analyses, the paper finds that Kerala has consistently experienced GDP growth, brought down poverty to a low single digit, and expanded access to electricity. It also faces volatile unemployment and inflation, environmental degradation, and erratic foreign direct investment inflows. Such issues call for improving infrastructure, promoting sustainability, increasing regional equity, and enhancing the capabilities of the workforce. The findings indicate that the Kerala model of development is an exemplary example of inclusive and human-centered policy, but it has to be further adapted to achieve long-term sustainability. This study provides useful lessons for policymakers in the implementation of equitable and sustainable development strategies globally.

Keywords: India, Kerala, economic development, poverty, economy, developing

Nový přístup k ekonomickému rozvoji v rozvojových zemích: Případová studie státu Indie-Kerala

Abstrakt

Tato diplomová práce se zabývá ekonomickým vývojem státu Kerala v Indii, jeho zvláštním "modelem Kerala" a investicemi do zdraví, vzdělávání a sociální péče. Výzkum se snaží definovat vývoj v nedávné literatuře, analyzovat ekonomickou trajektorii Keraly a zdůraznit strategie pro překonání pokračujících výzev. Použití kvalitativních a kvantitativních přístupů, jako jsou časové řady, popisný, a regresní analýzy, článek zjistí, že Kerala trvale zažívá růst HDP, snížil chudobu na nízkou jednocifernou hodnotu, a rozšířený přístup k elektřině. Čelí také nestálé nezaměstnanosti a inflaci, zhoršování životního prostředí a nevyzpytatelným přílivům přímých zahraničních investic. Tyto problémy vyžadují zlepšení infrastruktury, podporu udržitelnosti, zvýšení regionální spravedlnosti a posílení schopností pracovní síly. Zjištění naznačují, že model rozvoje Kerala je příkladným příkladem inkluzivní politiky zaměřené na člověka, ale musí být dále přizpůsoben k dosažení dlouhodobé udržitelnosti. Tato studie poskytuje užitečné poučení pro tvůrce politik při implementaci spravedlivých a udržitelných rozvojových strategií na celém světě.

Klíčová slova: Indie, Kerala, hospodářský rozvoj, chudoba, ekonomika, rozvojový

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List of Abbreviations

LDR	Labour Dependency Ratios
GDP	Gross Domestic Product
AUKUS	Asia-Pacific Security Pact
IMF	International Monetary Fund
EM	Emerging Markets

BCG	Boston Consulting Group
FINS	Forum for Integrated National Security Strategy
BJP	Bharatiya Janata Party
OLS	Ordinary Least Squares
USD	United States Dollar

1 Introduction

It has only been in recent decades that discourse has shifted toward inclusive and sustainable approaches to economic development with locational policy frameworks cut to size for the peculiar challenges of developing countries. This in itself says volumes about the limitations of the conventional model, which often sees high levels of industrialization and growth anchored on urban centres, leaving rural communities and peripheral populations susceptible to exclusion. In this case, India is a complex case because there are striking regional disparities and different development levels in the context of its states. Located in southwestern India, Kerala presents a unique socio-economic dynamic that avails an illustrative example of one of the alternative ways of doing economic development.

What is often referred to as the "Kerala Model" of development breaks away from traditional growth ways in that it focuses on human-cantered policy, whereby health, education, and social welfare have been given priority. Despite relatively modest per capita income, this model has achieved some of the highest literacy rates, life expectancy, and lowest infant mortality rates within India.

Emphasis on equitable distribution of resources, high social investments, and participation-friendly policies have rewarded the state with substantial gains in quality-of-life indicators. However, the development strategy not only of Kerala but also of whole India highlights several pitfalls, especially with regard to economic growth and in generating gainful employment opportunities for its human capital.

The present thesis explores whether and how certain aspects of the Kerala model of development could be internationally transferred or adapted to other Labour Dependency Ratios (LDR) within and outside India. This thesis also focuses to make a contribution to understanding of how place-based and inclusive policy measures can help attain the goal of sustainable development by studying some socio-economic policies, institutional frameworks, and public investment strategies put in place by Kerala.

The broader context of development challenges facing India as a whole, including issues of urban-rural disparities, infrastructure deficits, and environmental sustainability concerns that continue to persist in these states, form part of this study.

2 Objectives and Methodology

2.1 Objectives

This diploma thesis addresses the ways of reaching a new way of accelerating the rate of economic development of India, one of the world's fastest growing economies still suffering from a series of obstacles for viable economic development. The thesis seeks to understand the current state of economic development and provides recommendations on how to improve the current situation in one specific state, which is Kerala, the 21st largest Indian state by area with the population of approximately 35 million people.

The diploma thesis initially aims to identify the key aspects of development, how it is defined in modern literature, and what the key tools are for accelerating economic development. Subsequently, the thesis proceeds to the overview of the state with subsequent identification of the key obstacles preventing the state of Kerala from entering the path of viable and beneficial economic development. The resulting outcome of the thesis that has implications for the community of people living in Kerala is the provision of recommendations on how economic development can be enhanced in the region. The research questions are:

1) What is development, and how is it defined in modern scientific literature?

2) What is the state of economic development in Kerala state in India?

3) What are the main economic development issues in Kerala state in India?

4) How can the identified economic issues in Kerala state be solved?

2.2 Methodology

The diploma thesis uses both qualitative and quantitative methods. The qualitative methods are used in the literature review, and the quantitative ones are used in the empirical part of the work. Both parts draw on the secondary data obtained from IMF, The World

Bank, and the National Statistical Office of India. The quantitative analysis is represented by time series, descriptive, and linear regression analyses.

More specifically, the literature review is built upon a theoretical foundation represented by books, articles, reports, and other relevant scientific publications produced in the last 15 years. The focus on relatively recent publications is explained by the extremely dynamic nature of the studied topic, which is especially clear when taking into consideration the progress that India achieved in the last few years. The practical part also uses the study of various documents, but this is further complemented by the analysis of various databases that further allow the construction of the empirical basis of the work, which relies on the descriptive analysis (summary statistics), linear regression analysis (OLS), and the time series analysis (visualizations built through Excel and linear trends). The time series is used for the analysis of the key development and related indicators in Kerala, and it analyzes the period between 1999 and 2023. In the discussion part of the work, the findings of the practical part are compared with the findings of other researchers who will be mentioned in the literature review of the work. The limitations of the work involve a relatively narrow time series frame and the absence of complex statistical methods such as linear regression analysis.

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3 Literature Review

3.1 India

3.1.1 Issues of Development

India is the fifth largest economy in the world, and it has earned this status over a long journey of 75 years. The country has a proud history, an ancient civilization dating back thousands of years, with periods of prosperity and a rich cultural heritage. However, by the time it gained independence from British rule in 1947, India was a poor, backward country (Mandal, 2024). During this time, its development trajectory has seen ups and downs in economic development. Initially, after independence, India chose the path of state-led industrialization aimed at import substitution, an inward-looking strategy. In 1990, this was replaced by a liberalized open economy, and the status it has achieved today is largely due to the liberalization of trade and industrial policy regime (Corbridge, 2010). India has been plagued by a variety of issues over the course of its history, particularly over the course of the past ten years. These issues include poverty and income inequality, unemployment and underemployment, a deficit in infrastructure, educational inequality, accessibility and quality of healthcare, environmental degradation, agricultural issues, political and bureaucratic corruption, rapid urbanization, and the growth of slums (Image 1). Considering that the state is the second most populated on the planet Earth, all of these issues have been a significant contributor to the state's growth coming to a standstill (Jayal, 2013).

However, not all of the issues and poor progress persisted for an extended period of time since 2023 was a prosperous year for India. Observers were able to discuss the potential for the beginning of a new stage in the growth of one of the greatest nations in the world as a result of the spectacular win that the current Prime Minister, Narendra Modi, achieved in the parliamentary elections that took place in India in the spring of last year. The Western leaders extended an extraordinary greeting to the Prime Minister of India, Narendra Modi, while Russia provided New Delhi with unprecedentedly cheap pricing for renewable energy (P. L. Joshi, 2024). As a result of India's membership in both the Asia-Pacific Security Pact (AUKUS) headed by the United States and the BRICS group led by China and Russia, it would seem that everyone is interested in forming personal relationships with India (Dar, 2023). Additionally, it was able to successfully land on the moon for the very first time this

year. According to the data, all of this has occurred in a way that has been beneficial to the economy. The relocation of manufacturing from China to India is being undertaken by multinational firms as a means of mitigating risks and diversifying supply chains. At the same time, investors are rapidly purchasing shares of Indian enterprises. It would seem that India is prospering while the rest of the world is arguing and arguing with each other. However, up to this point, this has not had a significant influence on the level of life of the average Indian (Kouam & William, 2024).

Image 1, Map of India

Source: Amazon, 2019

In accordance with the most recent projections made by the Central Bank of India, the gross domestic product (GDP) of the nation is anticipated to display a growth rate of 7% for the second consecutive year. According to projections made by the International Monetary Fund (IMF), India has the potential to emerge as one of the economies that is expanding at the quickest rate in the world during the next few years (Dubey, 2023). This has resulted in Indian equities being the second-largest component of the index, behind China. From 2015 to 2020, the country's contribution remained relatively unchanged at around 8%, tripling over the course of the previous three years (Nayyar & Nayyar, 2024). There has been a record-breaking increase of 12% in the MSCI India index, which is comprised of around 85 percent of public businesses whose shares are traded in the nation. This was made possible by the stocks of banks and automobile manufacturers, as well as the flight of investors out from China as a result of a slowing economy, a crisis in the real estate market, and geopolitical tensions (Kumar, 2023).

It would seem, at first look, that the year 2023 has been an exceptionally prosperous one for India, and that the pendulum has been swung in a manner that is favorable. On the other hand, Ashoka Modi, who is now a visiting professor of international economic policy at Princeton University, is not optimistic about the rise of India. It is his contention that the GDP growth estimates are deceptive due to the fact that the Indian economy has expanded at a very slow rate during the course of the widespread coronavirus outbreak (Chacko, 2021).

If one takes the average growth rate over the previous four years and computes it, one will find that the Indian economy has expanded at a rate that is somewhere between 3.5 and 4%. An article titled "India is Broken" was published by Professor Modi in the current year. It is in his book "A People Betrayed, Independence to Today" that he outlines the reasons why India has not been able to attain sustained economic development over the course of the previous seventy-five years. The turbulence that has been occurring throughout the world in recent years has been beneficial to India's economy, yet India's economy is benefited by more than simply competing superpowers (Chatterjee & Subramanian, 2023).

When it comes to the global instability that has occurred over the last five years, India is largely regarded to be one of the primary beneficiaries. This includes the trade conflicts

between the United States and China, the coronavirus outbreak, and the war in Ukraine. Companies all across the globe have been compelled to reevaluate their supply chains as a result of all of these occurrences (Bardhan, 2022).

As a result, the United States trade with India increased by 44%, or $23 billion, while the United States imports from China to the United States decreased by 10% in terms of inflation-adjusted dollars from 2018 to 2022, according to recent research conducted by the Boston Consulting Group (BCG) (Morgan et al., 2022). The changes are even more noticeable in the structure of imports of mechanical equipment: over the same time period, the United States imported machine tools from India at a rate that was 70 percent higher than compared to China, which imported 28 percent fewer machine tools. In addition, businesses are interested in reallocating production capacity because of the losses they have sustained as a result of the forced closure of companies that occurred during the stringent "zero tolerance" measures that were implemented against COVID-19 in China. The cheaper labor costs in India are another reason why the country is appealing to business owners, particularly in light of the decision made by the administration of Donald Trump to impose tariffs on imports from China (Fravel et al., 2024).

However, in the months that have passed since 2023, a number of significant occurrences have occurred in India, drawing the attention of observers to the unfavorable tendencies that have been occurring in the nation that is the second most populous in the world. The trajectory of growth and development undertaken by India, though achieving some incredible success economically, is still faced with a host of obstacles that keep India from treading the path of sustainable development. Despite efforts to alleviate most of these challenges, over the past many years, problems relating to jobs, poverty, infrastructure, education, and environmental sustainability have persisted. Even while many industries continued to progress forward, structural inequities-most especially between urban and rural communities deny millions of people the benefits that come along with economic progress. The informal sector is the largest employer of labor in India, while offering low salaries, very poor job security, and minimal benefits. This forms a very weak economic base that any economic downturn or world crisis can easily shake. This dynamic is particularly precarious in the case of India's younger population, in whom employment opportunities lag far behind the high rate of population increase (Agarwala, 2013).

Added to these are issues of inequality in educational opportunities, which seem to pose one of the largest barriers to social and economic development. While India has seen considerable improvement in increasing enrollment rates, the quality of education largely differs from one region to another. Rural and urban poor settings have, in most cases, received less share in resource allocation compared to metropolitan settings. Poor family settings that lack opportunities to equip them with a set of skills are likely to have minimal job opportunities, leading to lesser earnings. A result from this quality education, the families give in to the persistent poverty cycles (Choudhury et al., 2023). Things become even more extreme when there is an overworked healthcare system that can barely cater to appropriate services for the huge population of the country, especially in far-off and rural areas where there are scanty medical institutions and experts. This holds more in places where medical personnel are in short supply. People are often required to travel considerable distances just to receive even the most basic medical attention, this places inordinate stress on families and communities alike. Besides that, high out-of-pocket health expenditures have pushed many households into poverty in general and thus have exemplified the tightrope many Indian families are forced to balance between economic security and access to basic services (Srivastava & Srivastava, 2023).

One of the big challenges that have existed for quite some time, even though they are among the crucial bases for sustainable development, is the lack of infrastructure. Even though India has invested huge amounts into its infrastructure projects, restricted access to energy, transportation networks, and inappropriate sanitation is still reflected in the countryside and remote areas. These shortfalls consequently affect the delivery of basic services, mobility, and access to markets, while at the same time creating barriers to economic opportunity and degrading overall quality of life (Mahadeva, 2024). First of all, bottlenecks in transportation disrupt supply chains-most particularly for the most perishable commodities, which are agricultural products. This further leads to economic losses and increased challenges faced by small-scale farmers. Agriculture, though a basic source of livelihood for a sizable fraction of India's population, is still susceptible to climatic vagaries, and insufficient and inadequate access to new technology and market fluctuation-all factors that further destabilize sources of income and perpetuate poverty in rural areas (Wani, 2023).

Environmental problems have also emerged as a major challenge over the last few decades due to severe environmental degradation caused by rapid urbanization and industrialization. In India, most cities have reached a dangerous proportion in air quality, hence the great threat to health and the institution of measures by the government for emission reduction. Water pollution, deforestation, and poor waste management add insult to injury since their effect touches on human health and biodiversity (Humbal et al., 2023). People of low income are also disproportionately affected by poor air and water quality, and such groups may be ill-equipped to adapt or mitigate these circumstances. Such environmental constraints also interact with socio-economic difficulties, since these are a result of the fact that poor air and water quality end. Reliance of India on coal as its major source of energy has also added to the output of greenhouse gases, creating an extra burden for the nation to balance its industrial sector growth with the responsibility it owes to the environment (Yamini, 2024).

An added layer of complexity to the growth of India is created by the presence of political and bureaucratic impediments. Incompetence, corruption, and bureaucratic red tape now act as impediments to the proper implementation of a number of well-intentioned policies and programs. This causes delays in infrastructure projects, constraints on foreign investment, and erosion of public confidence. The bureaucracy is also too inefficient even to respond to emerging issues effectively, from economic policy to education and health care (Kochanek, 2023). Policies aimed at such change meet tough resistance since strongly entrenched interests are involved. To add insult to injury, social issues like discrimination against underprivileged groups and gender inequality are still serving as a roadblock toward equal development. Despite several steps taken to ensure gender equality and maintain the rights of minorities, there are still gaps wherein the disadvantaged groups commonly face many obstacles in accessing information, jobs, and legal protection.

These complexities in development have thus created increased pressures of urbanization, adding to further socioeconomic strain. Major cities are becoming congested as millions of people from rural areas migrate into these urban centers in hopes of better opportunities. The result has been the formation of squatter settlements, more colloquially known as slums, which are plagued by deficient living conditions and an overall lack of basic infrastructure (Prajapati et al., 2024). In most cases, these would lack clean water,

sanitation, healthcare, or educational opportunities, because of which public health hazards are common, with cycles of urban poverty persisting. Housing markets have been stretched due to the migration of people into metropolitan areas, increasing costs and making affordable housing a rare commodity. The presence of urban poverty, along with the lack of basic facilities, inhibits not only the development of people in such congested areas but also brings greater problems in maintaining social order and public health (Pradhan & Pradhan, 2023).

While India's development path is exemplary in many ways, it still happens to remain fraught with challenges that require far-reaching and long-term implementation plans. The ability of such persistent but deep-seated problems to emerge requires a firm commitment to the cause of inclusive and sustainable development. This must be a commitment that will ensure that economic gains are fairly spread across all sections of society (Mohan, 2023).

To increase the country's international standing and its reputation as a "serious global player" and to provide new chances for faster development and economic progress, the present leadership of India has put up ambitious and long-term objectives since coming to power in May of 2014. These goals are meant to boost the country's international standing. According to Dattesh Parulekar, Vice President of the Forum for Integrated National Security Strategy (FINS), Modi has made concerted efforts over the past five years to restore India's lost strategic status in South Asia and to recognize Delhi as a regional leader in line with the country's de facto role in the region (V. Joshi, 2017). These efforts have been made in accordance with the fact that India has been playing a much more significant role in the region. The government of Prime Minister Narendra Modi has declared the commencement of a number of large-scale changes in the areas of the economy, administration, finance, and society in order to address the developing inequalities in development (Li, 2017). When it comes to development, the authorities continue to state their ambition to raise the national GDP to $5 trillion by the year 2024, which is an objective that cannot fail to be considered a good choice (Qureshi, 2024).

Without the consolidation of the country, the Indian establishment thinks that further growth and reinforcement of national power, particularly in international affairs, is impossible. Therefore, the centralization of the state, which is an essential objective for the

Indian leadership, continues to be an important priority. From the perspective of domestic politics, the primary objective here is to foster the development of a greater sense of self-awareness at the national and religious levels among Hindus. It is within the context of this strategy that the majority of international observers consider the primary cause for the liquidation of the special status of the state of Jammu and Kashmir, which was the only administrative entity that was largely Muslim at the time. This action was done by the administration of Modi in August of the previous year (Nazish et al., 2024). Without taking such a step, it would be impossible to discuss the ultimate objective of the Bharatiya Janata Party (BJP), which is now in power, and the forces that are backing it, which is the declaration of India as a country mostly comprised of Hindus. The political rewards that are now being brought about by the stake on the national emotions of the majority of the country's citizens are already being realized. The BJP saw their share of the vote rise from 31 percent to 37 percent at the time of the parliamentary elections (R. Singh, 2023). It is also swiftly growing its position in power at the state level, notably via "defectors" from the ranks of competing parties. Modi's party is also fast strengthening its position in power. On the other hand, the present leadership of India is putting a lot of emphasis on centralization and, in particular, national consolidation of the state and society. This, in turn, would certainly result in the radicalization of minorities, notably Muslims, whose number, according to the most recent estimates, surpasses 200 million people (M. P. Singh & Saxena, 2023). The year 2019 was marked by a number of instances of widespread demonstrations by the Muslim community. Right now, India looks like a country that will be among the first among the world's major powers to demonstrate its ability to make a decision on a potentially difficult dilemma - the priorities of security and national development. Despite all the shortcomings that have emerged during his first term in power, Narendra Modi and his associates have managed to secure even greater trust from broad sections of the electorate. Now the Indian authorities will have to prove that they are capable of giving a new progressive impetus to the country's long-term internal development. At the same time, they will continue to move along the path of turning India into a "systemically important" power in South Asia (Shaikh et al., 2023).

3.1.2 Policies Accelerating Development

India was in need of an alternative development plan that would not only take advantage of the efficiency of the market but would also protect the nation's fundamental interests. Not only would the implementation of this approach result in the attainment of the status of a developed economy, but it would also lead to the achievement of inclusive development. It is impossible for market forces to function in a vacuum. The markets are constructed and given the authority to act in a successful and effective manner. The rules, policies, and infrastructure expenditures of the government all influence the markets. This indicates that India's development plan has to be supplemented with these principles in order for the country to reach the position of an inclusive developed nation by the year 2047 (George, 2023).

The vaccination war that has been going on between rich nations and underdeveloped countries during the COVID-19 pandemic has brought to light the negative aspects of globalization that is pushed by liberalization. Humanitarian requirements have been pushed to the background in favor of national objectives. It has been shown that when faced with extreme and unusual conditions, globalization often comes into conflict with national interests rather than being a catalyst for collaboration. By developing and manufacturing COVID-19 vaccines on its own, India has been able to vaccinate more than one billion of its inhabitants against the virus (B. Singh et al., 2023).

Because of this, the nation has been compelled to reconsider its national objectives regarding both self-sufficiency and market efficiency, as well as globalization. It is important to highlight that India has already accepted the issues that climate change presents: a decreased industrial base and growing economic disparity. This is something that should be taken into consideration. In light of the circumstances that existed before to and during COVID-19, the government of India presented an economic plan known as the Atmanirbhar Bharat Package in May of 2020. This policy attempts to not only assist the nation in being self-sufficient but also to capitalize on the advantages that come with a market economy (Kori et al., 2023).

It should be brought to attention that the new approach for self-sufficiency is unique in comparison to the protectionist policy that the nation had previously used in order to safeguard its emerging sector. This self-sufficiency came at a tremendous cost for India, as it resulted in a weakening of the economy and an increase in the level of poverty. It asserts that the new definition of self-sufficiency does not imply a self-centered and solitary lifestyle. The new meaning of self-reliance is founded on the idea of *vasudhaiva kutumbakam* (meaning "the whole world is one family"), which holds that the whole world is one family and that the development of the Indian economy is an essential component of the development of all of humanity (A. K. Singh et al., 2024).

Five pillars serve as the foundation for the Self-Reliant Bharat approach. These pillars include the economy, infrastructure, system, lively demographic, and demand. The first pillar, which is economics, is that any solution must be scalable in such a manner that it provides economies of scale and makes the economy cost competitive. This is because the size of the Indian society is so large. As was said before, markets do not function in a vacuum; rather, the market generates fundamentals that subsequently aid in the enhancement of its capabilities. There is a need for substantial expenditures in contemporary infrastructure, but these investments must be carefully considered (Kalinin et al., 2024).

As an example, it will be challenging to address the climate problem if investments in infrastructure that is heavily dependent on fossil fuels are raised and if these expenditures are planned to persist for a significant amount of time. For this reason, it is imperative that investments be made in the development of contemporary infrastructure that is both energy-efficient and less reliant on fossil fuels. India is a constitutional democracy, and in order to put its new development plan into action, it is necessary for the country to make use of superior technology. Trust, increased economic efficiency, and forward movement are all benefits that come from an economic system that is founded on current technology (M. K. Mishra, 2023). There is no unfairness in such a system. In order to realize the notion of "Self-Reliant Bharat," it is necessary to develop an efficient system that is based on contemporary technology. Society's demographics are the primary factor in determining the possibilities and difficulties that it encounters. It is not only the country with the greatest population in the world, but it also boasts a population that is both varied and youthful. In order for the nation to be able to take advantage of the demographic dividend, it is imperative that the

young people be supplied with the required professional skills, as well as excellent health and fitness. In other words, the nation needs to prioritize education and healthcare as its primary concerns (Upadhyay & Malik, 2024).

Image 2, Atmanirbhar Bharat

Source: Tribal,2025

Goldberg and Reed (2023) claim in a new study that in a world where national interests take precedence above humanitarian concerns, the size of the home market is the factor that dictates the course that economic growth will take. A country's ability to enjoy the advantages of economies of scale is directly correlated to the size of its local market. As a result, the new development plan places an emphasis on bolstering demand and supply chains. This involves collaborating with all relevant stakeholders to enhance supply networks in order to maximize and technologically advance demand. The approach lays a particular emphasis on the means of production and institutions, as well as on different

sectors of the economy, such as home industries, micro, small, and medium firms, unskilled workers, the middle class, and other sectors (Mathew & Custer, 2023).

Over the course of the last several years, a number of procedures have been carried out in order to alleviate supply-side limitations in the Indian economy. A simple, reasonable, and strong digital financial system, supply chain reform in agriculture, a simple and rational tax system, clear regulations for enterprises, human resource development, and labor law reform are some of the things that fall under this category (Ghosh et al., 2023). The country's financial and investment requirements may be met with the assistance of a financial industry that is both efficient and sound. The Make in India industrial strategy is supported by these changes, which also foster entrepreneurship and attract other types of investment (Image 3). With the implementation of the Self-Reliant Bharat plan and the implementation of basic reforms to overcome supply-side restrictions, it is anticipated that the efficiency of all sectors of the economy would increase, and the country will become more competitive on the world stage (Image 2). In addition to this, it is anticipated that progress of this kind would be more sensitive to the requirements of the society (Shettigar & Misra, 2022).

Image 3, Make in India Logo

Source: European Parliament, 2015

During the shutdown, the Indian government made the decision to spend money on infrastructure rather than on doles in order to stimulate economic development and provide

employment opportunities. This decision was made with the goal of achieving the Self-Reliant Bharat policy in mind (Image 2). Over the course of the last decade, expenditures on infrastructure have surged by about five times. Furthermore, in addition to concentrating on traditional sectors of the economy, the Make in India initiative has acknowledged the need of making significant progress in contemporary and high-tech industries throughout this time period (Chaurey & Le, 2022). Several missions have been initiated with the purpose of investigating quantum computing, semiconductor chip manufacturing, and artificial intelligence, as well as forming partnerships with major nations such as the United States. Mobile phones and drones are two examples of industries in which the nation has become an exporter. In the past, the country was reliant on the outside world for these products. Additionally, the private sector has been given access to the space sector; the collaboration between the public sector and the business sector is breaking through taboos and assisting the nation in accomplishing its intended objective (Pullamaraju, 2021).

Over the course of the last several years, the Indian economy has been showing signs of consistent development. Job creation and employment have been gradually expanding; the unemployment rate has decreased from 6.1% in 2017-18 to 3.2% in 2022-23. This represents significant progress. The presence of a current account deficit that is manageable and inflation that is under control is indicative of a macroeconomic condition that is in good health. It is possible to take control of the current account deficit, which is a reflection of the dependency on international commerce. A public digital infrastructure on a massive scale and a digital payment system have both been designed and implemented by the economy (Aggarwal, 2023). Following its recovery from the "twin-balance sheet problem, the financial sector is now in a position to meet the financial requirements of the economy. This is a significant improvement over the situation that existed earlier. Significant progress has been made in reducing the proportion of gross non-performing assets, which has decreased from around 11% in 2017–18 to just 3.2% in 2022–23. As an indication of greater economic activity, the rise in indirect tax receipts might be seen as a positive development (B. Mishra & Padhan, 2024). Moreover, one can see that there has been a significant increase in the construction of physical infrastructure in the economy over the course of the last few years. According to what was said before, the Indian economy had already started to slow down prior to the COVID-19 epidemic, and it has shown to be one of the most susceptible economies in the world. In the year of the Covid, the contraction reached a level of 7%. As

a consequence of the short-term and long-term steps that were implemented before and after the pandemic as part of the new development plan, the economy has not only recovered from the effect of COVID-19, but it is currently doing well and is among the main economies that are expanding at the quickest pace in the world. Research that was published not too long ago demonstrates that the post-Covid growth has been inclusive, with the lowest twenty percent of the population being able to reclaim their economic standing (Ahmad & Hussain, 2024).

3.2 Development: Definition, Mechanism, and Indicators

Development is a multifaceted and intricate term that has undergone enormous transformation across centuries. Although development synonymously referred to growth in economic eras and industrial growth, more recent conceptions prefer a wider canvas encompassing social, environmental, and institutional dimensions (Hariram et al., 2023). Development today is not just about augmenting the national income or constructing roadways; it also involves introducing changes in the standard of living of people, promoting equity, and developing enduring systems that have worked over decades. One of the basic aspects of development is that it is multidimensional. It is economic, social, and political development. Economically, development involves betterment of the standard of living and wealth creation to all segments of society. It involves growth in GDP, low levels of unemployment, better trade balances, and productivity. These economic indicators tell us only half the story. Social development is equally of the greatest importance, and focus is on education, health, social justice, and well-being (Kwatra et al., 2020). Political stability, government, and the quality of institutions are equally crucial determinants since these are the environment within which economic and social development can grow and prosper (Nadeem et al., 2020).

Development mechanisms include a cluster of processes and policies adopted by governments, global institutions, and communities. The economic policies of growth, like investments in infrastructure, trade facilitation, and entrepreneurial promotion, are not uncommon. Social policies that support increased access to education and health, equity, and protection of vulnerable groups also come into play (Vargas & Cooper, 2024).

Further development mechanisms include regulatory and legal reforms that support an enabling environment for stability and growth. In reality, the process of development is both internal and external. Internally, the country's resources, the government, institutional capacity, and socio-political environment are all critical. Globally, economic trends, international trade policies, foreign investment, and foreign aid can push development or slow it down. For instance, a nation such as India with its heterogeneous states illustrates how regions develop at varying rates based on varying policies, local administration, and external assistance (Audretsch et al., 2020).

The Kerala model of development, focusing on human capital expansion through education and health investments, illustrates how policy interventions at key points in time can create profound development effects without necessarily capturing high per capita incomes (Image 4). Development is typically measured with the assistance of a range of indicators that provide quantitative information on the progress of a country (Ahammed & K, 2024). Such indicators help to quantify the extent to which a country or a region is advancing in terms of economic performance, social welfare, and institutional effectiveness. The most significant economic indicators include GDP growth, employment rate, productivity, inflation, and trade balance. Social indicators tend to target education (enrollment in schools, literacy rates), health (life expectancy at birth, infant mortality), and quality of life indicators like the availability of electricity and clean water. Governance indicators like corruption measures, government effectiveness, and political stability capture the robustness and reliability of institutions (Seguino, 2020).

Image 4, Kerala Map

Source: Maps of India, 2022

The most famous indicator of development is the Human Development Index (HDI), constructed by the United Nations. HDI aggregates economic information (per capita income), education (average years of schooling and years of schooling expected), and health (life expectancy at birth) into a composite index. The HDI emphasizes that development is

not just about economic development but also about people's overall well-being (Yumashev et al., 2020).

The second major indicator is the Sustainable Development Goals (SDGs), which are global goals for poverty alleviation, health, education, and environmental protection. The SDGs are a new development vision that transcends the conventional economic indicators to include ecological and social considerations. Through their efforts to close gaps, ensure sustainable economic growth, and protect the environment, the SDGs offer a holistic approach to development policy across the globe (Moyer & Hedden, 2020). In spite of these indicators, development is a difficult phenomenon to measure. Quantitative measures, although helpful, may not always reflect qualitative factors like the psychological or cultural well-being of people. In addition, development is not unidirectional; nations can degenerate as a result of economic downturns, natural disasters, or political instability (Joshanloo, 2021).

For example, the development of Kerala has seen both failure and success, improvement in social indicators such as literacy and health, but not abating challenges in areas such as unemployment and infrastructure growth. Ultimately, development is a dynamic process demanding adaptive policies, ongoing monitoring, and the ability to learn from success and failure. Sustainable development strategies need to reconcile current short-term demands and future sustainability in a way that today's progress does not jeopardize tomorrow's generations' well-being. The Kerala experience in this thesis demonstrates the ways in which strategic investment in people and inclusive policies can result in desirable outcomes. It also identifies why economic and structural difficulties need to be confronted so that the progress made is maintained and expanded. The mechanisms and indicators outlined in this chapter will aid in a full analysis of Kerala's development policy and its assessable relevance for other regions sharing similar issues (Chatterjee, 2024).

3.3 Issues with the Measurement of Development

Development is a multifaceted task to measure that goes beyond tracking economic growth or income levels. Although conventional metrics such as GDP have been employed for long periods of time as standards for development, they have the proclivity to overlook

the overall features of human well-being and social advancement (Akarsu, 2023). GDP quantifies the overall economic production of a nation but does not consider income distribution, environmental sustainability, or human welfare. The limited attention to economic production occasionally gives a distorted view of development since it may indicate improvement even when significant portions of the population are impoverished or when there is inequality (Fraumeni, 2022).

One of the major problems in quantifying development is that it is difficult to select relevant indicators that convey a holistic perspective of advancement. Various nations and regions have varying agendas and priorities, and thus it is challenging to arrive at a consensus measure of development (Meadows, 1999). For example, innovation and technological progress may be more pertinent for high-income nations, but developing nations may emphasize basic needs like healthcare, education, and poverty reduction. The HDI is one attempt to craft a more expansive indicator of development by including measures of income, education, and health. Yet even the HDI is incomplete in that it does not entirely capture disparities within nations or environmental degradation (Pandey et al., 2022).

A second challenge in measuring development is data reliability and availability. Most developing nations do not possess the statistical apparatus to garner precise and current data. Discontinuities in global reports and studies could thus result. To illustrate, poverty levels, unemployment levels, or literacy levels may be premised on aged statistics or interpolated from tiny sample surveys that may not be representative of the overall population. The experience of India, and indeed Kerala, is telling in this regard (Liu & Panagiotakos, 2022). Although Kerala has high literacy and life expectancy rates by comparison, its success may not be adequately captured in national statistics because of states' differences in methods of data collection. Measurement of social indicators is also problematic. Literacy rates, life expectancy, and access to health care, for example, are commonly utilized indicators to determine development, but they do not essentially demonstrate the inherent quality of services.

A nation can have high enrolment rates at the high-school level, yet it doesn't automatically imply that education is good quality or even that students are learning the appropriate skills (Kannan, 2023). Healthcare access can be high, yet the quality of the

services can be poor or the services may be unaffordable with minimal subsequent well-being improvement. Traditional quantitative metrics struggle to make such distinctions. Ecological sustainability is another aspect of development that is hard to quantify precisely. Metrics such as carbon emissions, deforestation, and species loss are utilized to gauge the health of the environment, yet these don't necessarily connect back in a direct way to human development results. A nation might be developing economically at the cost of its physical environment, with the long-term repercussions not being reflected directly in development statistics (Voelker et al., 2022). For example, China's accelerated industrialization has wrought dramatic GDP growth at the cost of atrocious air and water pollution with adverse impacts on the health and well-being of the population.

Kerala, as an example of sustainable development, presents another model, but even here, environmental indicators will not record the full impacts of economic activity on the ecosystems. There is then also a question of how development indicators treat inequality. Aggregate measures such as GDP or mean income can mask considerable inequality in a population. Economies with high income inequality can be performing well overall, yet large sections of the population can be getting none of the benefits of such growth. The Gini coefficient is a means of quantifying income inequality but does not give a picture of inequalities in other aspects, for example, in access to health or education. In Kerala, for instance, though general development indicators are positive, regional disparities and inequitable access to resources persist (Growiec, 2022).

Also, the social and cultural situation in a country may influence how development is lived and also measured. Measures appropriate in one cultural setting will be less appropriate in another. For instance, Western indicators of well-being, which tend to highly value personal income and consumption, may be less than fully relevant to communities where communal living and shared resources have greater significance. These kinds of cultural variation point to the necessity for context-specific indicators that will address local priorities and values (Evans, 2007).

A second methodological concern is the subjectivity of some development indicators. Happiness indicators or life satisfaction measures, for instance, are based on self-reported information, which may fluctuate extensively with personal expectations, social pressures,

and cultural norms. Such subjectivity may render inter-country or inter-temporal comparisons of levels of development problematic. For example, the World Happiness Report measures countries in terms of subjective well-being, and yet the rankings do not necessarily align with more objective measures of development, such as access to healthcare or income (Macků et al., 2020). Finally, measuring development needs to be a balancing act between quantitative and qualitative data. As far as quantitative indicators give us measurable targets, qualitative input allows us to grasp the daily life experiences of citizens within a country (Hirai, 2022). For Kerala, a synthesis of conventional economic indicators, social indicators, and sustainability analysis gives a truer picture of development. Despite a multi-dimensional framework, there are difficulties in encompassing the entire range of development processes. The consideration of such concerns is crucial to devising effective solutions to improve measurement methodologies and, ultimately, to devising better development outcomes in Kerala and elsewhere (Khalid et al., 2022).

4 Practical Part

The practical part of the diploma thesis is split into three segments, where the division is performed based on the type of analysis applied. In the first sub-chapter, which is the sub-chapter dedicated to the time series analysis, a series of techniques belonging to statistical inference and time series analysis are implemented, notably visualizations and trend projections (linear, exponential, and polynomial). This part of the analysis is performed using Microsoft Excel.

In the next sub-chapter, a descriptive analysis is applied, and the goal of this analysis is to gain insights into the data, and to also identify the main tendencies. This chapter is the first one that makes use of Gretl statistical software, which is the primary tool for calculating the following measures – mean, median, standard deviation, minimum, and maximum.

The final sub-chapter of the practical part relies on the utilization of the linear regression analysis, and this specific analysis helps to identify factors determining the level of economic development in Kerala state. This chapter relies on Gretl once again and on the OLS method.

When it comes to the selected indicators for the analysis, their list is universal as all sub-chapters utilize the primary dataset that was collected for Kerala state. The indicators are collected based on the current state of the art discussed in the literature review of the diploma thesis, and they involve the following ones: GDP per capita (measured in 2015 constant $), unemployment (measured in %), inflation (measured in %), FDI net inflow (measured in billion $), exchange rate (measured in rupees per USD), poverty (measured in the population share living below 2.15$), and the share of population with access to electricity (%). Table 1 presents the collected dataset.

Table 1. Collected data for Kerala state (1999-2023).

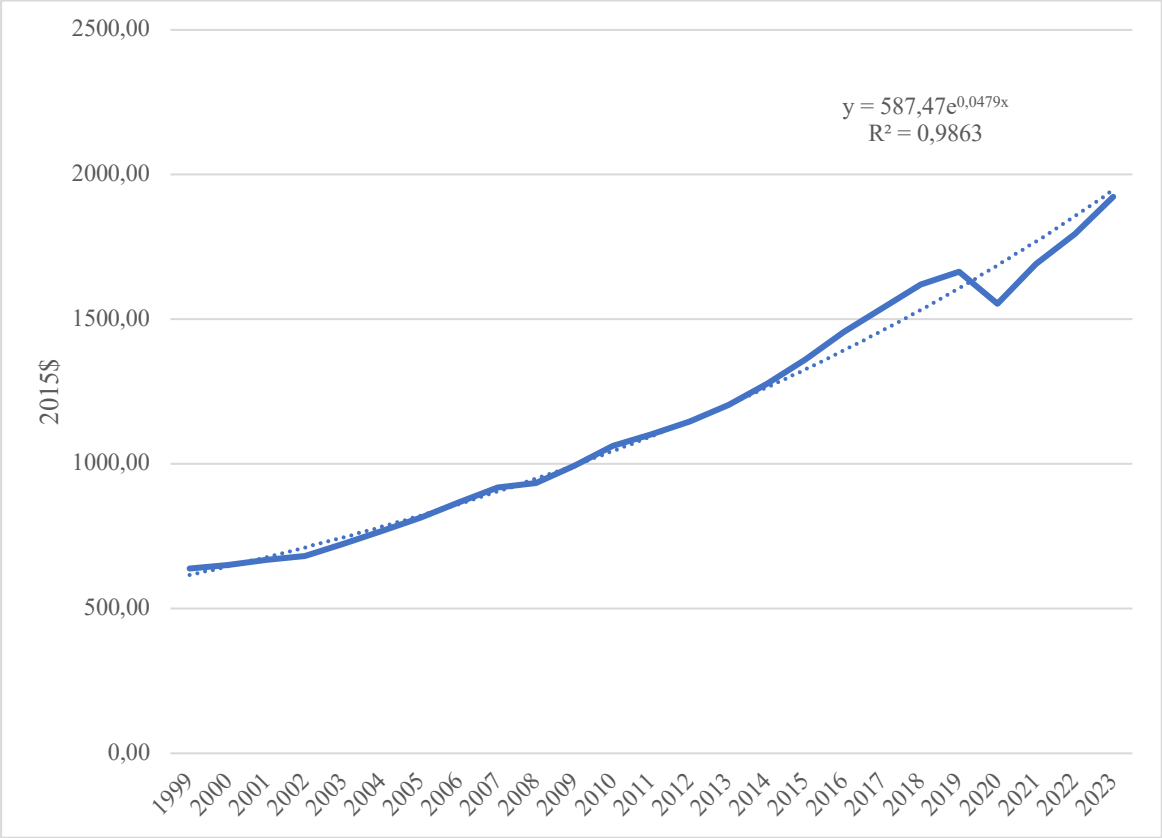
Year	GDP per capita, constant 2015$	Unemployment, %	Inflation, %	FDI, net billion $	Exchange rate, R/$	Poverty, %	Electricity, %
1999	638.58	8.83	5.84	0.43	43.06	70.28	45.08
2000	650.77	9.03	5.01	0.72	42.42	70.14	45.23
2001	669.52	9.24	4.72	1.03	47.19	71.96	46.50
2002	682.51	9.49	5.37	1.04	48.61	63.70	46.73
2003	723.50	9.66	4.76	0.74	46.58	60.48	49.05
2004	767.63	9.83	4.71	1.09	50.42	56.84	48.30
2005	815.05	10.00	5.31	1.45	44.10	58.10	51.60
2006	867.08	9.91	7.25	4.01	45.31	55.44	50.93
2007	919.55	9.81	7.97	5.05	41.35	53.90	54.23
2008	934.40	9.76	10.44	8.68	43.51	47.46	55.58
2009	993.39	9.67	13.60	7.12	48.41	46.90	56.25
2010	1062.24	9.57	14.99	5.48	45.73	43.40	57.23
2011	1102.19	9.46	11.14	7.30	46.67	32.06	60.42
2012	1146.46	9.38	11.85	4.80	53.44	31.50	65.42
2013	1203.53	9.30	12.52	5.63	58.60	28.27	62.33
2014	1276.51	9.19	8.33	6.92	61.03	28.29	63.83
2015	1362.24	9.08	6.13	8.80	64.15	26.32	66.00
2016	1457.24	8.97	6.19	8.89	67.20	25.34	67.20
2017	1538.28	8.88	4.16	7.99	65.12	18.76	68.85
2018	1619.69	8.80	4.92	8.42	68.39	15.54	71.78
2019	1664.99	7.49	4.66	10.12	64.24	18.48	71.93
2020	1553.59	9.04	8.28	12.87	65.24	21.70	72.38
2021	1690.17	7.34	6.41	8.95	73.92	18.06	74.70
2022	1794.03	5.55	8.37	9.99	78.60	15.82	74.40
2023	1923.23	4.80	7.06	5.62	82.60	15.26	74.55

Source: National Statistical Office of India, 2024

4.1 Time Series Analysis

This chapter relies on visualizations created per each variable, starting with Figure 1, visualizing the development of GDP per capita in Kerala state, which is the key indicator of economic development.

Figure 1. GDP per capita in Kerala (1999-2024).

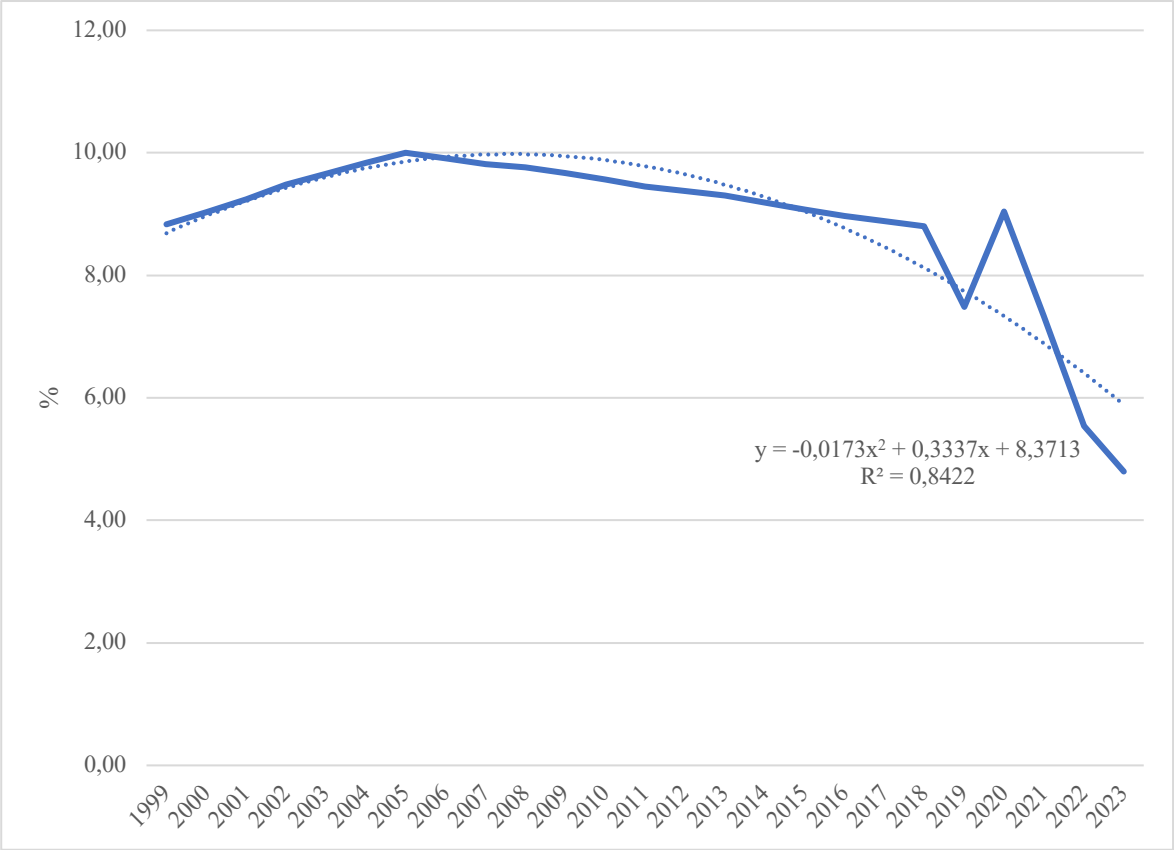


Source: own analysis of National Statistical Office of India, 2024

The level of economic development was steadily improving in Kerala, which is easily confirmed by looking at the chart from 1999 to 2023. Moreover, when analyzing the development, it becomes apparent that there were barely any years when the economic development was halted. One such year was the year 2020, which was exacerbated by the COVID-19 pandemic, and the outcome of this year in terms of economic development in Kerala is quite anticipated. At the same time, the pandemic did not fundamentally reverse the trend and Kerala's level of economic development continued improving after the pandemic, where it took the state just one year to return to the pre-pandemic level. The projected exponential trade indicates that the improvement in the level of economic

development was of an exponential nature, and the annual improvement in the level of economic development was, on average, equal to 4.79%, according to the slope of the exponential function. Figure 2 subsequently proceeds to the visualization of the unemployment rate in Kerala from 1999 to 2023.

Figure 2. Unemployment in Kerala (1999-2023).

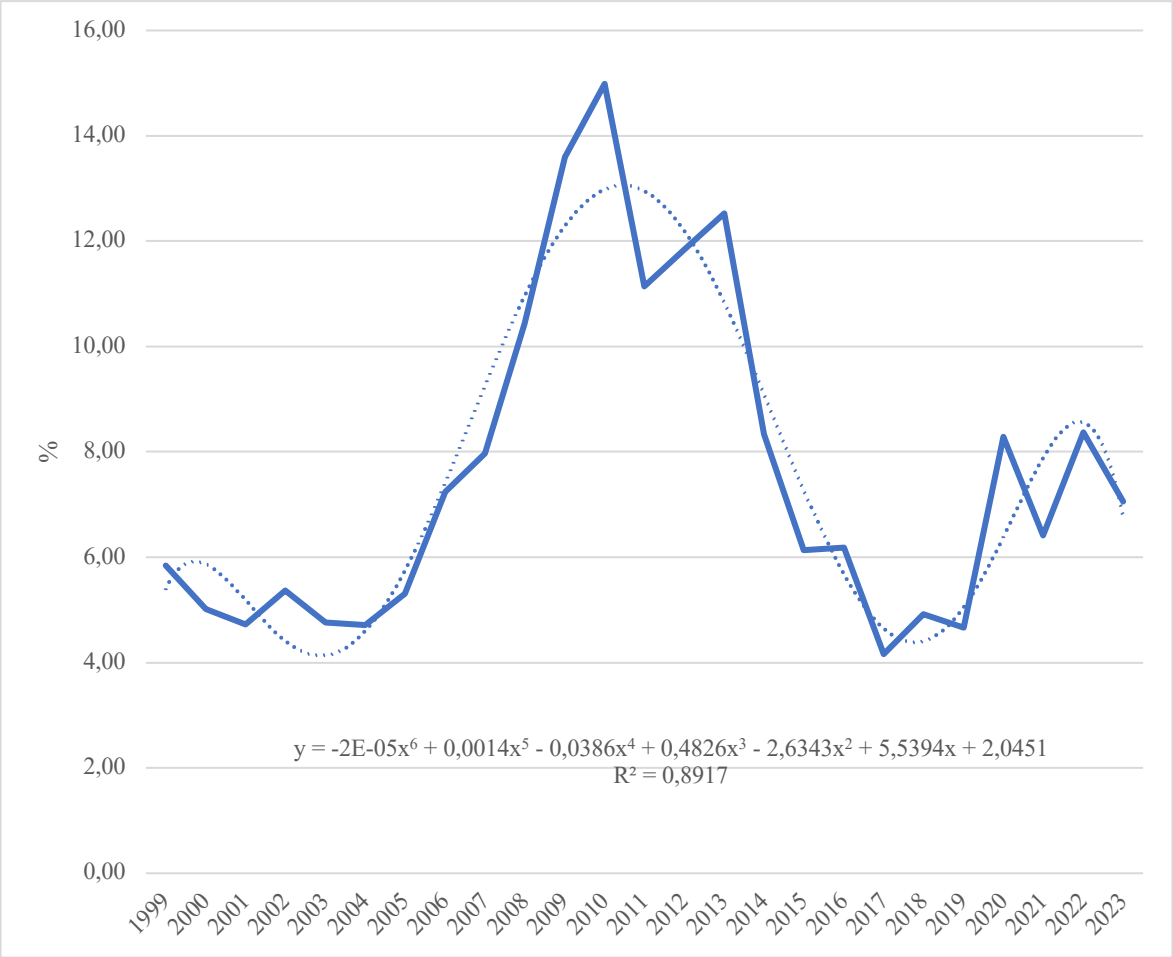


Source: own analysis of National Statistical Office of India, 2024

Unemployment in Kerala has not developed in the same manner throughout the years, and it is possible to distinguish two specific periods – the period prior to 2004-2005 and the period post-2005. Before 2005, the unemployment rate in Kerala was gradually increasing, and it eventually approached the figure quite close to 10 percent. Then, from 2005 onwards, the development was categorized by a decreasing trajectory in the average unemployment rate in the state. There was only one year post-2005 when the unemployment rate increased, and it happened during the COVID-19 pandemic, which is not at all surprising given the pressure of restrictions against the spread of the virus. Once again, the state succeeded in continuing its positive trajectory after the COVID-19 times, which is confirmed by the

development of the indicator in recent years. The trend is in the form of a parabola, which is explained by the presence of those two periods. Figure 3 shows the inflation rate in Kerala from 1999 to 2023.

Figure 3. Inflation in Kerala (1999-2023).

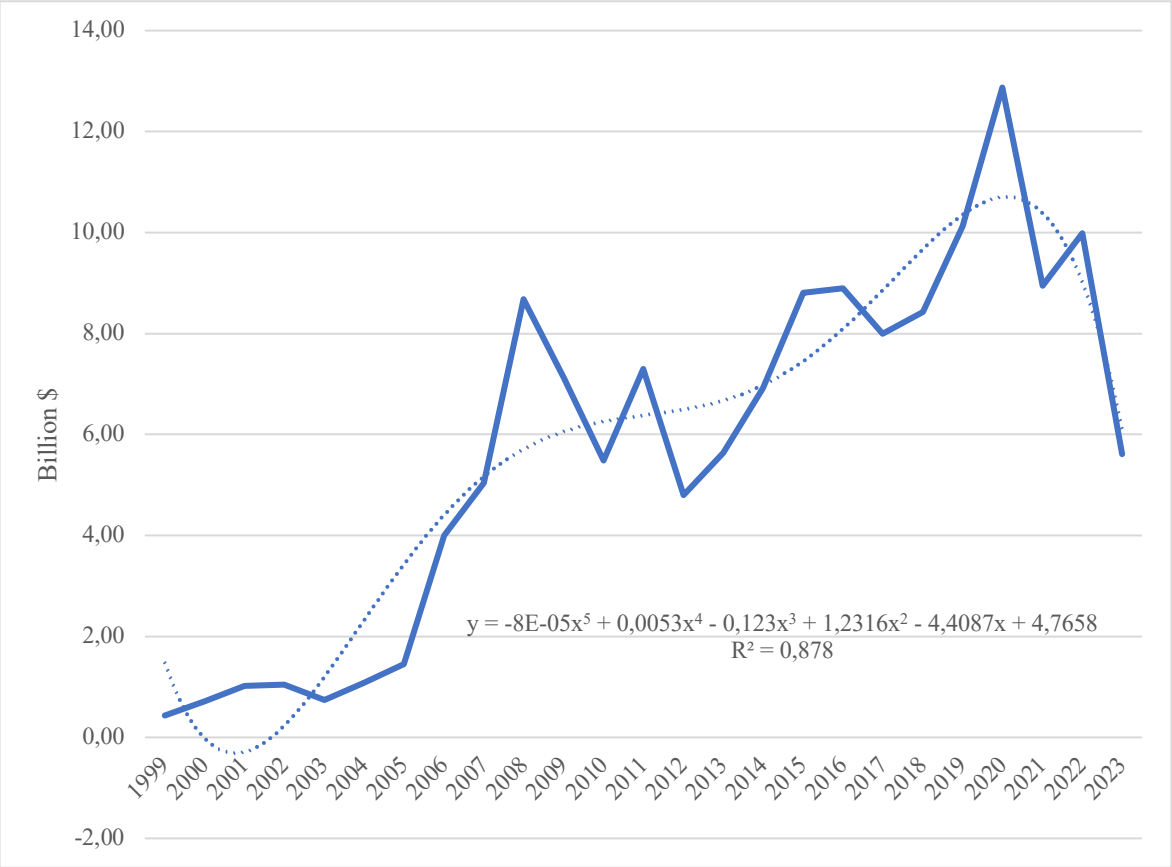


Source: own analysis of National Statistical Office of India, 2024

The development of the inflation rate in Kerala was by far more hectic than of the unemployment rate, which is confirmed by the fitted polynomial trend of a substantially higher order. Seemingly, however, the situation in Kerala did improve a bit in the latest years compared to the post-Great Recession period, but the recent dynamic with a certain upward-sloping tendency is concerning given that the level of inflation is already quite high for a country aiming to become a developed one. The absolute worst times in Kerala from the perspective of price stability happened right after The Great Recession (2008), and the period of high inflation persisted for approximately 5-6 years, which is a major problem for the purchasing power of the state's residents. At the same time, the events are likely the

influences of the macroeconomic landscape of the whole Republic of India rather than consequences of specific policies or internal issues in Kerala. Figure 4 proceeds to the visualization of the FDI net inflow in Kerala from 1999 to 2023.

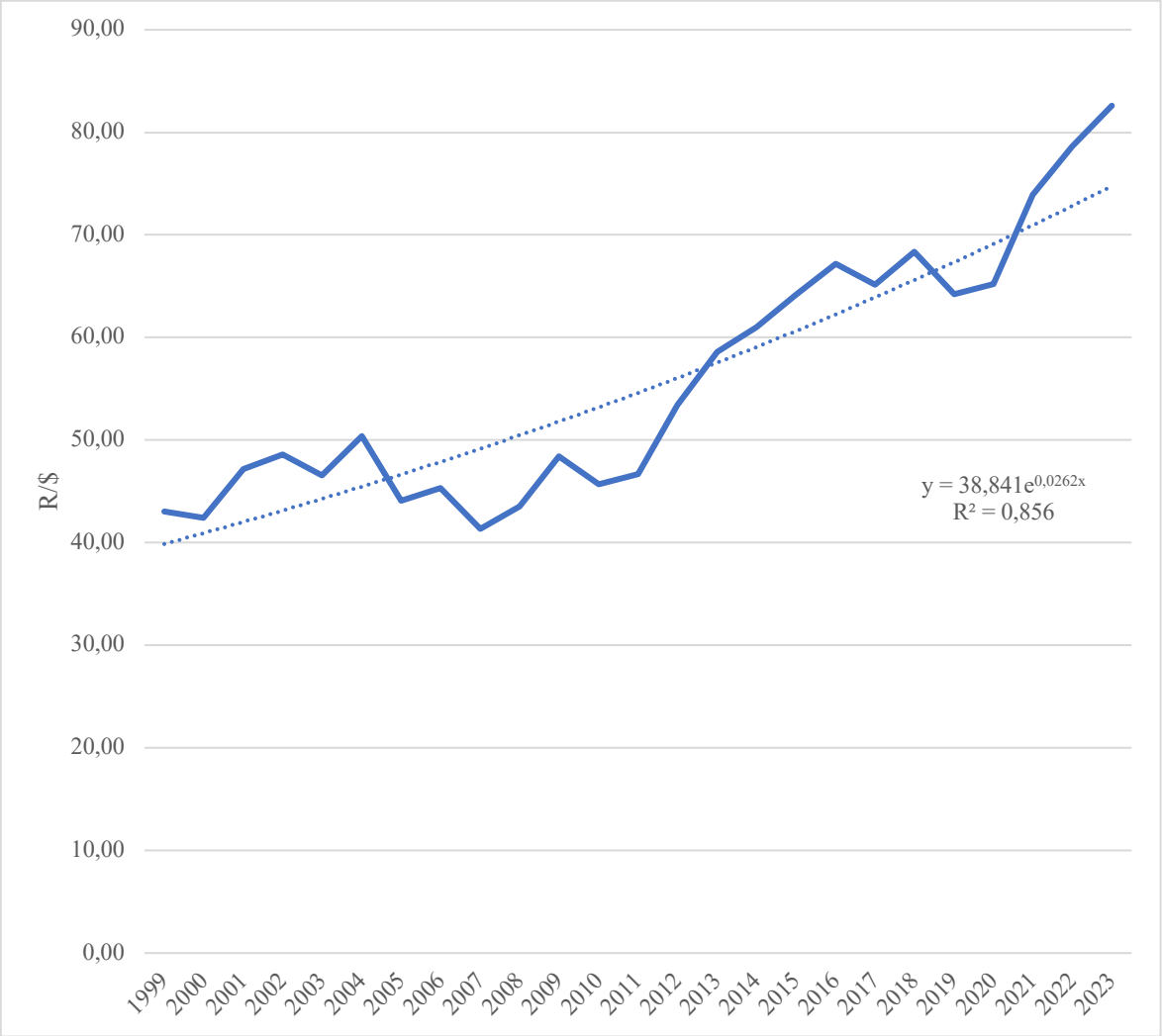
Figure 4. FDI net inflows in Kerala (1999–2023).



Source: own analysis of National Statistical Office of India, 2024

FDI net inflows were increasing in Kerala, which is a good sign, but they were increasing in quite a hectic way with no singular linear or exponential trend visible. As such, the level of FDI was quite low and static until 2006, and from 2006 until the Great Recession in 2008, it was increasing. Following the world financial crisis, the level of FDI inflows dropped, which was not at all unexpected, but it soon recovered and reached the historic maximum in 2020, which was the pandemic year. At the same time, the recent dynamic is quite concerning with the net FDI inflows falling quite rapidly. It indicates a need for the state to act and increase the attractiveness of the state to foreigners and foreign companies. Figure 5 proceeds to the only variable that is not Kerala-specific but India-specific, and it is the exchange rate of rupees to the USD from 1999 to 2023.

Figure 5. Exchange rate in India (1999-2023).

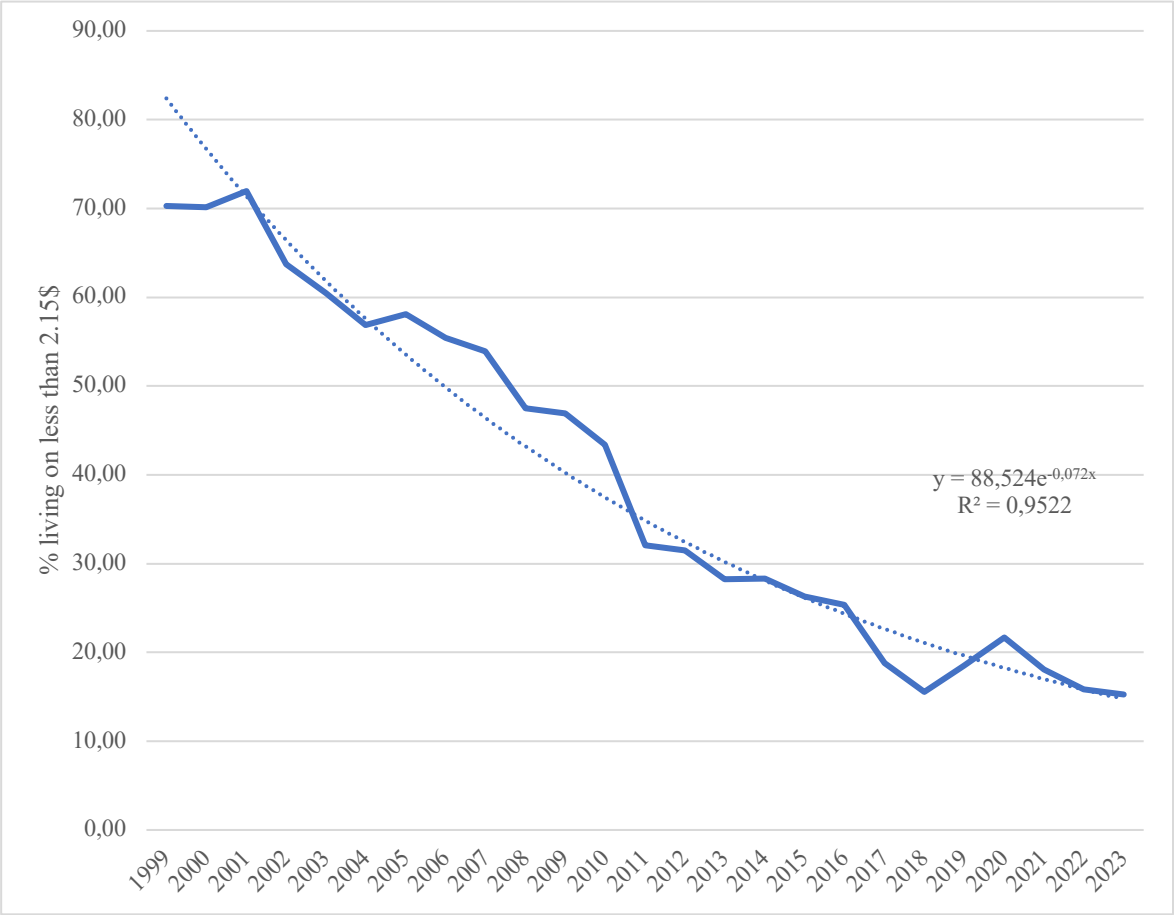


Source: own analysis of National Statistical Office of India, 2024

Exchange rate in India was appreciating or static from 1999 to 2012, which is, generally speaking, is not a bad situation and a sign of the country's ability to control its currency even despite an extremely dynamic economic landscape, both internal and external. Yet, from 2012, the situation was rapidly changing with the currency rapidly depreciating, which by itself is not a bad sign and a sign that potentially, India and its states, such as Kerala, were becoming more and more attractive to foreigners since India was becoming cheaper and cheaper. This suggestion is consistent with the geopolitical and economic situation in the South-East Asia, where other players as Pakistan, Vietnam, and Bangladesh were actively keen on taking over a specific share of the market. According to the exponential trend, the average annual depreciation of the Indian domestic currency was equal to 2.62%. Figure 6

continues to the poverty rate variable, which is Kerala-specific and depicts the development from 1999 to 2023.

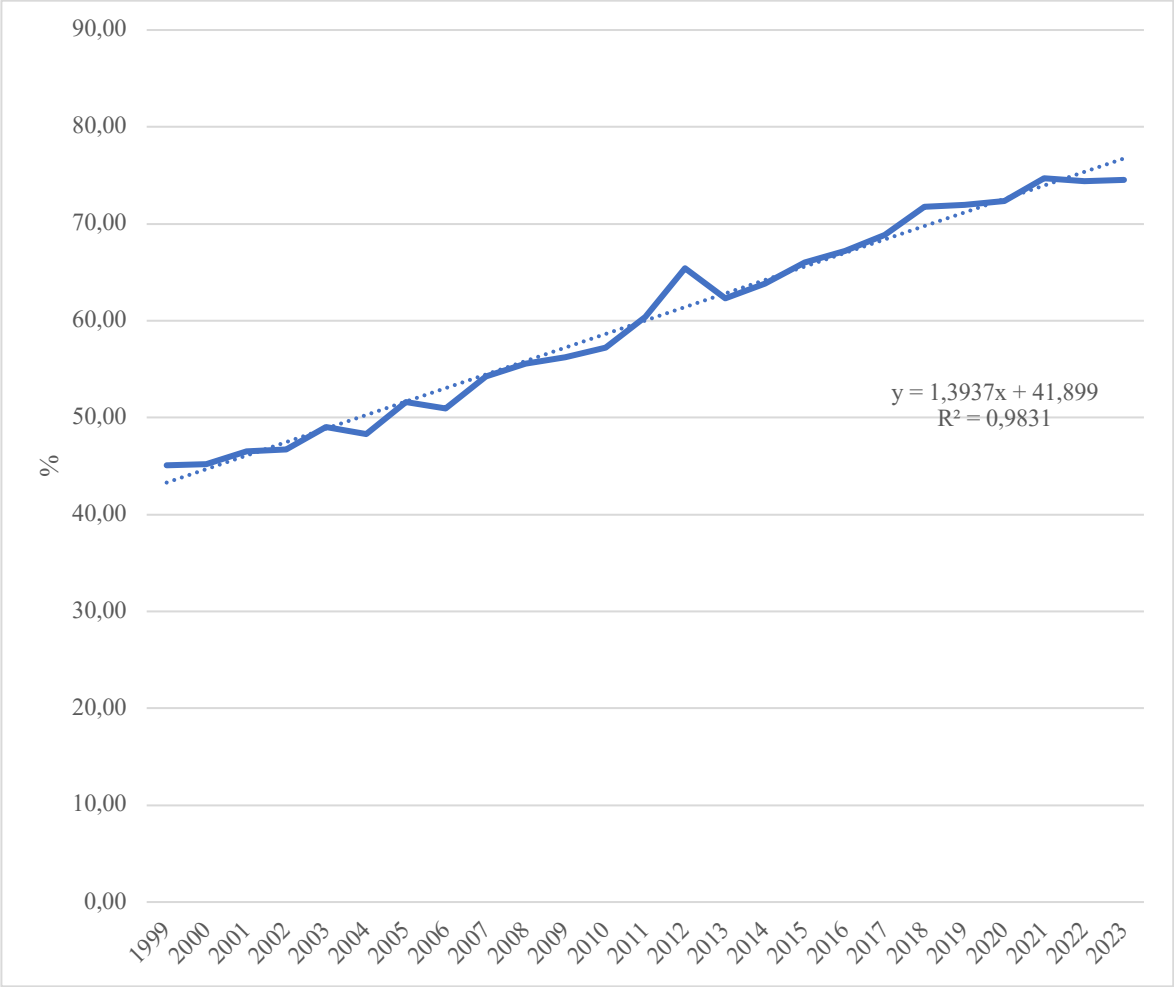
Figure 6. Poverty rate in Kerala (1999-2023).



Source: own analysis of National Statistical Office of India, 2024

The poverty rate in Kerala has rapidly fallen over the years, and this specific trajectory indicates that the country is on its way to breaking the circle of poverty and finally entering the group of either the lower- or upper-middle-income category. The development of the poverty rate was extremely positive, which is certainly a likely side-effect of the improvement in the level of economic development that has already been noted in the same chapter earlier. When it comes to the projected trend, it suggests that the annual decrement in the poverty rate in Kerala was equal to 7.2%, which is an extremely optimistic and good figure for a developing country and for a state that has for years struggled with breaking the cycle of poverty. Figure 7 proceeds to the very final variable, which depicts the access to electricity of the population of Kerala from 1999 to 2023.

Figure 7. Access to electricity in Kerala (1999-2023).



Source: own analysis of National Statistical Office of India, 2024

The access to electricity of the population of Kerala was rapidly increasing over the years. Yet, it still did not reach 100% in the year 2023, which can be a major obstacle to achieving any viable economic development. Presumably, if the trend continues in the same way (according to the slope of the trend function, the annual increment in the value of the population share with access to electricity was increasing by 1.39 percentage points), the state will be able to reach the figure of 100% in just a matter of decades or even faster, if the level of technology and technological progress allows. The next chapter proceeds to the descriptive analysis.

4.2 Descriptive Analysis

Figure 8 presents the overview of the calculated metrics of summary statistics using Gretl software.

Figure 8. Summary statistics for Kerala state's metrics (1999-2023).

	Mean	Median	S.D.	Min	Max
GDPpercapitacons~	1162	1102	401.7	638.6	1923
Unemployment	8.883	9.245	1.293	4.798	10.00
Inflation	7.600	6.414	3.119	4.160	14.99
FDInetbillion	5.725	5.631	3.603	0.4337	12.87
ExchangerateR	56.33	48.61	12.98	41.35	82.60
Poverty	39.76	32.06	19.71	15.26	71.96
Electricity	59.77	59.62	10.28	45.08	74.70

Source: own analysis of National Statistical Office of India, 2024

The descriptive analysis gives a statistical summary of the major indicators of economic development in Kerala. By analyzing these statistics, one can find out the central tendencies, dispersions, and other characteristics of the data from 1999 to 2023. This analysis is the bedrock for comprehending the trends and patterns in the state's economic progress, highlighting both achievements and persisting challenges.

In the case of GDP per capita, the means for the period under survey shows a gradual increase, which reflects the overall improvement in the living standard of Kerala. The variability, as depicted by the standard deviation, signals the fluctuations due to global economic events and regional policies. The minimum and maximum values further illustrate the journey from a relatively low-income state to one with a burgeoning economy.

In the case of unemployment rates, it shows a divided trend: earlier years have recorded high levels of unemployment; this, however, fell quite remarkably with policy intervention

from later years. The reduction indicates good governance and socio-economic policies aimed at creating jobs, particularly in the post-2005 era. Still, these usually go up during global crises like the COVID-19 pandemic and remind us how labor markets are vulnerable to such shocks.

Inflation was quite volatile, as inferred from the higher standard deviation compared to other variables. High inflationary periods, especially in the aftermath of the Great Recession, reduced the purchasing power of households. Though improving in recent years, the trend reflects the continuous challenge in price stability, which is an important factor for sustainable economic growth.

Though overall positive, FDI net inflows have been inconsistent in the series of years. While commendable peaks in flows during the pandemic year are laudable, the general trajectory is underpinning the requirement to harden Kerala as an attractive destination for foreign investors. Strategic enhancements in infrastructure, ease of doing business, and policy clarity can give further fillip to the FDI inflows.

The exchange rate of the Indian rupee against the US dollar also plays an important role. Its depreciation has been in tune with recent global trends and India's increasing integration into the world market. Such depreciation improves competitiveness for exports, although it increases costs for importing states like Kerala, whose imports are intensive in fuels and technology.

Indeed, the greatest achievement is that of the reduction of poverty rates. The continuous fall in poverty rates in Kerala testifies to the success of its socio-economic policies regarding education, health, and equitable distribution of resources. These achievements are in tune with the "Kerala Model" of development, which stresses human capital rather than pure economic growth indicators.

Access to electricity, a key indicator of infrastructural development, has tremendously improved. The consistent increase in the proportion of the population with access to electricity signals progress in bridging infrastructural gaps. Yet, the fact that complete access is yet to be realized indicates areas that need further attention.

These descriptive statistics bring forth the fact that the economic development trajectory of Kerala is punctuated by remarkable achievements amidst relentless challenges. The information drawn from this analysis will play an important role in further regression analysis, putting a finer understanding on the driving and hindering forces governing economic progress in this state.

4.3 Linear Regression Analysis

Subsequently, after performing the preliminary analysis, this chapter proceeds to the estimation of a linear regression model that will use the selected indicators and measure their effect on the level of economic development in Kerala state from 1999 to 2023. As the first step of the linear regression estimation, it is downright crucial to first present the economic model that will explain the basic relations between the metrics. This model is presented in equation (1):

$$y_t = f(x_{1t}, x_{2t}, x_{3t}, x_{4t}, x_{5t}, x_{6t}) \quad (1)$$

where y is the value of GDP per capita in 2015$ in year t in Kerala state, x_1 is the unemployment rate in Kerala in %, x_2 is the inflation rate in Kerala in %, x_3 is the FDI net inflow in billion $ in Kerala, x_4 is the exchange rate in India in rupees/USD, x_5 is the poverty rate at 2.15$ per day in Kerala state in % from the total population, and x_6 is the access to electricity in Kerala state in % from the population. The subsequent step is the creation of an econometric model, where the selected fit is the double-log model for two purposes. The first purpose is that, according to the econometric theory, the logarithmic fit leads to better model quality and properties, and, secondly, this fit allows to compare the effects of various predictors between each other since the estimated coefficients directly project elasticities and not partial derivatives. The original econometric model is in equation (2):

$$y_t = \gamma_{11} * x_{1t}^{\gamma_{12}} * x_{2t}^{\gamma_{13}} * x_{3t}^{\gamma_{14}} * x_{4t}^{\gamma_{15}} * x_{5t}^{\gamma_{16}} x_{6t}^{\gamma_{17}} + u_t \quad (2)$$

where $\gamma_{11\ldots n}$ are estimated parameters, and u_t is the error term. Subsequently, in order to estimate this equation, it is vital to linearize the relationship using logarithms, where the resulting model is presented in equation (3):

$$\ln y_t = \ln \gamma_{11} + \gamma_{12} \ln x_{1t} + \gamma_{13} \ln x_{2t} + \gamma_{14} \ln x_{3t} + \gamma_{15} \ln x_{4t} + \gamma_{16} \ln x_{5t} + \gamma_{17} \ln x_{6t} + u_t \quad (3)$$

The model is tested for normality (Jarque-Bera test), heteroscedasticity (White's test), and autocorrelation (Breusch-Godfrey test), and the fitted curve is eventually compared with the observed one to judge the quality of the estimate. The goal is to have an estimate with the highest possible goodness-of-fit. The estimation is performed in Gretl, where the first step involves the verification of whether the model suffers from multicollinearity (level of 0.8 is the point that indicates problems). Figure 9 presents the initial correlation matrix.

Figure 9. Initial correlation matrix.

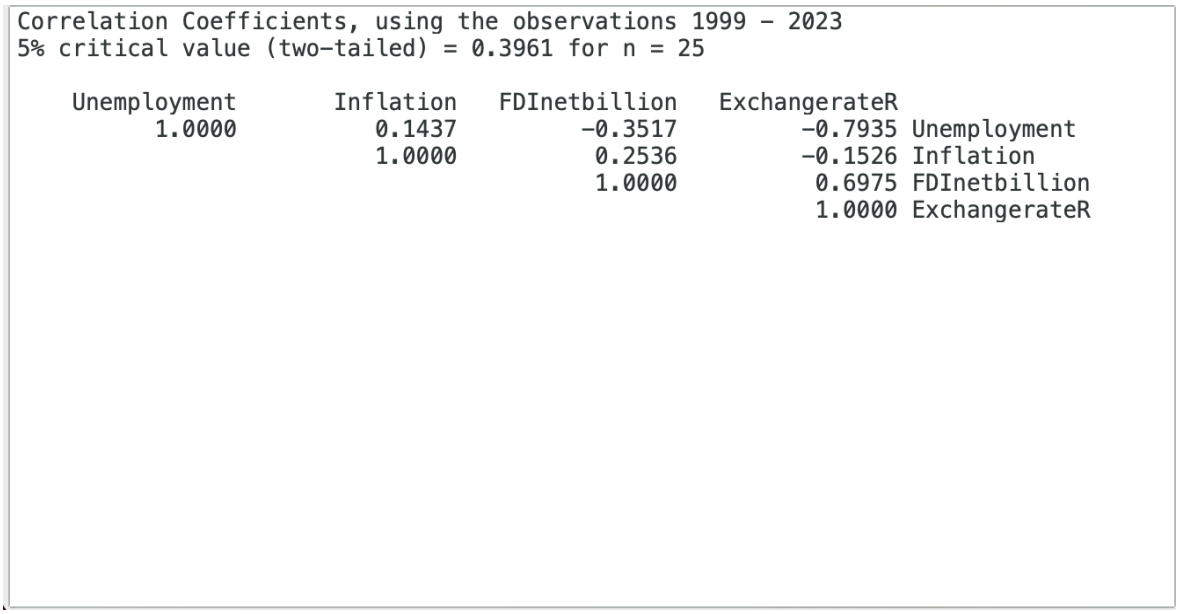
```
Correlation Coefficients, using the observations 1999 - 2023
5% critical value (two-tailed) = 0.3961 for n = 25

    Unemployment       Inflation   FDInetbillion   ExchangerateR
          1.0000          0.1437         -0.3517         -0.7935 Unemployment
                          1.0000          0.2536         -0.1526 Inflation
                                          1.0000          0.6975 FDInetbillion
                                                          1.0000 ExchangerateR

         Poverty     Electricity
          0.5687         -0.6550 Unemployment
         -0.1471          0.0696 Inflation
         -0.8519          0.8661 FDInetbillion
         -0.8672          0.9225 ExchangerateR
          1.0000         -0.9771 Poverty
                          1.0000 Electricity
```

Source: own analysis of National Statistical Office of India, 2024

There is certainly a problem of multicollinearity in this model, and this problem predominantly arises from the presence of two variables – the poverty rate, and the access to electricity. Due to their complex nature and multicollinearity with the overwhelming majority of variables, it is decided to eliminate the final two variables, which results in the

shrinking of the original models (1), (2), and (3) to just 4 predictors. Figure 10 presents the final correlation matrix indicating the absence of the problem with multicollinearity.

Figure 10. Final correlation matrix.



```
Correlation Coefficients, using the observations 1999 - 2023
5% critical value (two-tailed) = 0.3961 for n = 25

    Unemployment       Inflation   FDInetbillion   ExchangerateR
          1.0000          0.1437         -0.3517         -0.7935 Unemployment
                          1.0000          0.2536         -0.1526 Inflation
                                          1.0000          0.6975 FDInetbillion
                                                          1.0000 ExchangerateR
```

Source: own analysis of National Statistical Office of India, 2024

Subsequently, after the multicollinearity check was successfully completed, it is possible to proceed to the estimation of the parameters and their interpretation, which is done thanks to the output from Gretl presented in Figure 11 on the next page of this diploma thesis.

Figure 11. OLS estimation for the double-log model.

```
Model 4: OLS, using observations 1999-2023 (T = 25)
Dependent variable: l_GDPpercapitaconstant2015

                   coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------------
  const              4.43945      0.877116      5.061    5.97e-05 ***
  l_FDInetbillion    0.187986     0.0268137     7.011    8.41e-07 ***
  l_Inflation       -0.0312195    0.0530117    -0.5889   0.5625
  l_ExchangerateR    0.735653     0.151816      4.846    9.81e-05 ***
  l_Unemployment    -0.271065     0.132886     -2.040    0.0548   *

Mean dependent var   6.999000   S.D. dependent var   0.354309
Sum squared resid    0.101823   S.E. of regression   0.071352
R-squared            0.966203   Adjusted R-squared   0.959444
F(4, 20)             142.9442   P-value(F)           2.07e-14
Log-likelihood       33.31894   Akaike criterion    -56.63789
Schwarz criterion   -50.54351   Hannan-Quinn        -54.94756
rho                  0.209889   Durbin-Watson        1.543224

Log-likelihood for GDPpercapitaconstant2015 = -141.656

Excluding the constant, p-value was highest for variable 10 (l_Inflation)
```

Source: own analysis of National Statistical Office of India, 2024

The gammas can be fitted into the initial model, which results in the creation of the final model in equation (4):

$$y_t = e^{4.43} * x_{1t}^{0.188} * x_{2t}^{-0.031} * x_{3t}^{0.736} * x_{4t}^{-0.271} + u_t \quad (4)$$

- When the unemployment rate in Kerala increases by 1%, GDP per capita in Kerala decreases by 0.271%, ceteris paribus. This is fully consistent with the economic theory.
- When inflation in Kerala increases by 1%, GDP per capita in Kerala decreases by 0.0312%, ceteris paribus. This is fully consistent with the economic theory.
- When FDI net inflows in Kerala increase by 1%, GDP per capita in Kerala increases by 0.188%, ceteris paribus. This is fully consistent with the economic theory.
- When the exchange rate in India depreciates by 1%, GDP per capita in Kerala increases by 0.735%, ceteris paribus. This is an interesting finding that might theoretically be viewed with a certain skepticism, but given the export-orientated nature of Kerala, where commerce with the rest of the world thanks to a huge

number of ports in the state forms the backbone of the local economy, this is a fully logical finding and a one that is also fully consistent with the economic theory.

When it comes to the statistical properties of the model, the goodness of fit is equal to 0.96 or 96%, meaning that just 4% of the variation in the dependent variable was not explained by the selected predictors that remained in the model after accounting for the multicollinearity problem. When it comes to the result of the F test, the model is statistically significant at 1%, 5%, and 10%, which is a great result. When it comes to the statistical significance of individual components of the model, constant, FDI, and exchange rate are significant at 1%, 5%, and 10%. Unemployment is significant at 10% but not significant at 1% and 5%. Inflation is not significant at all, making it the only indicator that does not have any significant effect on the GDP per capita in Kerala. Figure 12 proceeds to the series of tests that allow to understand if additional econometric assumptions of the model are violated or not.

Figure 12. Econometric tests.

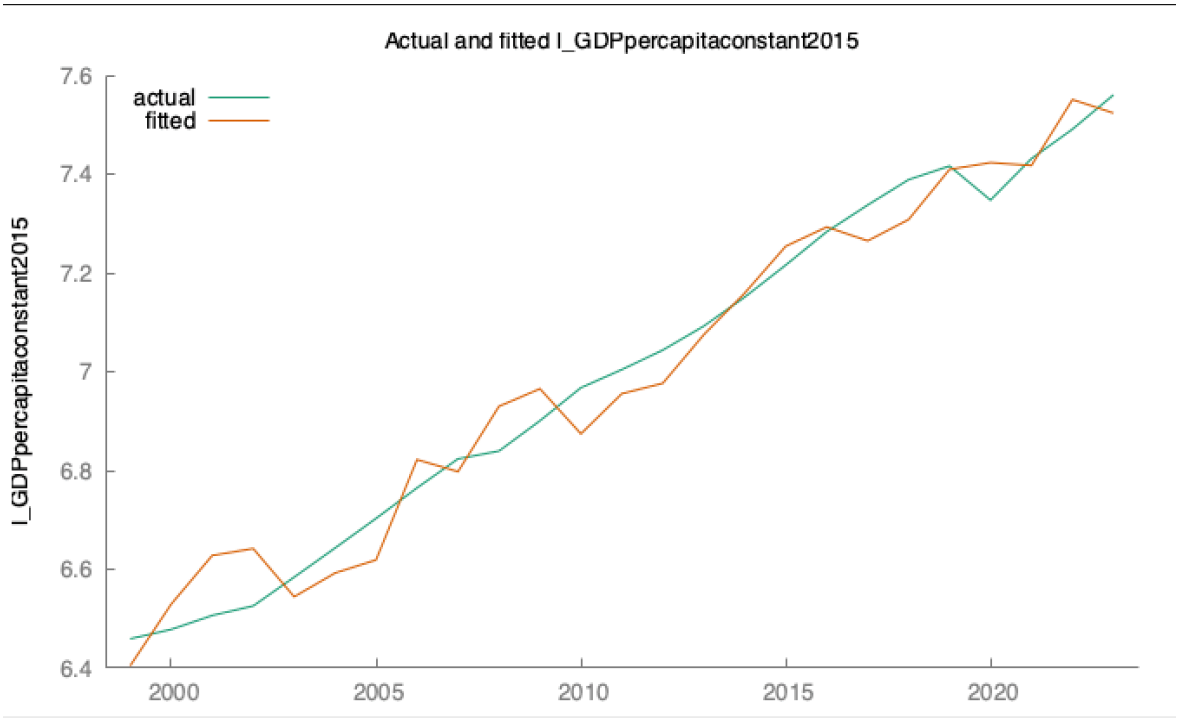
```
White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 9.74259
  with p-value = P(Chi-square(14) > 9.74259) = 0.780751

Test for normality of residual -
  Null hypothesis: error is normally distributed
  Test statistic: Chi-square(2) = 3.18235
  with p-value = 0.203686

LM test for autocorrelation up to order 1 -
  Null hypothesis: no autocorrelation
  Test statistic: LMF = 0.93555
  with p-value = P(F(1, 19) > 0.93555) = 0.345577
```

Source: own analysis of National Statistical Office of India, 2024

Normality is present, heteroscedasticity is not present, and autocorrelation of residuals of the first order is not present. The model does not suffer from any specific econometric issues, which confirms its large applicability in the context of forming recommendations on how Kerala can improve its situation with economic development. Figure 13 finalizes the

analysis with the comparison between the fitted and observed curves, which are clearly similar and nearly identical, further confirming an exceptional quality of the estimate for Kerala's level of economic development. Discussion follows in the next part of the thesis on the subsequent page.

Figure 13. Actual versus fitted curves in Kerala's GDP per capita.



Source: own analysis of National Statistical Office of India, 2024

5 Results and Discussion

5.1 Definition of Development

The concept of development has undergone a sea change from mere economic growth to the social, environmental, and institutional one. In their contemporary renditions, inclusiveness, sustainability, and equity have become the catchwords. The "Kerala Model" of development, by giving high priority to human capital through investments in health, education, and welfare, thus fits into the above-mentioned principles of development. This model demonstrates that development is multidimensional and must extend beyond GDP metrics to address systemic inequities and ensure equitable resource distribution.

5.2 Kerala and Economic Development

The economic development indicators of Kerala have been showing a gradual improvement, as reflected in the growth of its GDP per capita. The exponential nature of growth, averaging 4.79% annually, speaks volumes about the resilience and adaptive policy mechanisms of the state. After a brief setback during the COVID-19 pandemic, Kerala bounced back, which underlined the strength of its socio-economic frameworks.

The unemployment trend has been two-phased: a continuous rise until 2005 and then a sharp decline. This change indicates the effectiveness of employment policies and industrial development policies. However, spikes in unemployment during global crises, like the pandemic, have shown the fragility of labour markets and require further diversification and resilience-building measures.

Inflation, while still a challenge that has reflected broader national and global economic dynamics, remains consistent. High inflationary periods since 2008, coupled with recent upward trends, indicate the need to pursue more stringent monetary and fiscal policies to stabilize prices and protect purchasing power.

This decline is a very remarkable decline, amounting to an annual reduction of 7.2% in the poverty rate in Kerala. Indeed, this progress testifies to Kerala's commitment toward

social equity and human development. While the increase in access to electricity is laudable, it again indicates the need for further infrastructural investments toward universal access.

5.3 Challenges to Kerala's Development

Despite these achievements, Kerala is still facing a lot of challenges. While FDI inflows have been on the rise, erratic patterns indicate the need for increased investor confidence through rationalized regulations, ease of doing business, and better infrastructure. Further, dependence on imported fuel and technology adds to the vulnerability of currency depreciation, which again points to the need for fostering local production and reducing external dependencies.

Another important challenge is environmental sustainability. The rapid urbanization process, deforestation, and water pollution are jeopardizing human health and biodiversity. This calls for a development policy that incorporates the principles of sustainability and more strict environmental regulations.

5.4 Recommendations to Kerala

The foregoing analysis thus suggests the following strategies for overcoming Kerala's developmental hurdles:

1) Improvement in infrastructure, reduction of bureaucratic red tape, and innovation can lead to sustained foreign and domestic investment in Kerala. Promotion of technology hubs and clusters around specific industries would provide additional strength to economic activity.

2) Although there has been substantial reduction in poverty in Kerala, intra-state regional disparities have to be addressed. Area-specific programs for rural and peripheral sections of society can make growth more inclusive.

3) Integrating renewable energy solutions, sustainable agricultural practices, and effective waste management systems will help to reduce the negative impact of rapid urbanization and industrialization.

4) Vocational training programs and employment policies in emerging sectors will contribute to lowering unemployment and better prepare the labor force for future economic changes.

5) Electricity and other essential services must be available if inclusive development is to be undertaken. The acceleration of infrastructure investments could bridge these gaps.

6 Conclusion

The three major objectives of this diploma thesis were to understand how development is defined in contemporary literature, to analyze the status of economic development in Kerala, and to identify and suggest solutions for the major economic problems facing the state. The findings, based on both qualitative and quantitative analyses, provide meaningful insights into Kerala's development trajectory and its implications for broader policy applications.

The first research question was to identify the definition of development as perceived in recent literature. Certainly, the concept of development in recent times goes well beyond economic growth. In the modern day, development is a multidimensional concept covering social equity, environmental sustainability, and institutional robustness. The "Kerala Model" is an excellent example of this broader view through its high investment priorities in health, education, and social welfare. Its commitment to egalitarian distribution of resources and human capital formation makes it a case of good quality of life with extremely high GDP growth rates is not a prerequisite.

The present level of economic development: the second research question indicated that Kerala is characterized as having enjoyed sustained economic growth with its GDP per capita growing at an average of 4.79%. This growth trajectory, which also showed resilience during the COVID-19 pandemic, underlines how strong the socio-economic frameworks of the state are. Poverty rates have declined quite significantly, showing the success of inclusive social policies. The state has also done better in increasing access to basic services such as electricity and improving literacy and life expectancy, thus making it stand out as a development success story within India.

However, challenges are still ahead. The unemployment rate, though on an improving trajectory since 2005, is still susceptible to external shocks, as was seen during the pandemic. Inflationary trends reflect persistent price volatility, at the cost of purchasing power and economic stability. Foreign direct investment inflows have risen but in such a spiky way that there is a need to increase investment attractiveness by way of rationalizing regulations and investing in infrastructure.

The third research question was on identifying and addressing the main economic challenges facing Kerala. Some major issues include dependence on exogenous factors, like fuels and technology imported from other countries, which make the economy vulnerable to global price fluctuations and currency depreciation. A very important concern is environmental sustainability. With rapid urbanization, deforestation, and water pollution, the health of the public and biodiversity are in jeopardy and call for more stringent regulations and a greater emphasis on sustainability.

Based on the findings, recommendations that can be suggested involve infrastructure development and innovations for attracting sustained foreign and domestic investments in Kerala. The promotion of technology hubs and industrial clusters will spur economic activity and jobs. Second, to reduce regional disparities in the state, policies concerning rural and marginalized communities, in particular, must be framed toward the aim of balanced regional development. Thirdly, the incorporation of renewable energy and sustainable agricultural practices into development policies will go a long way in mitigating environmental risks. Finally, vocational training and emerging industry-focused interventions can reduce unemployment and better equip the workforce for future economic changes.

This thesis thus identifies that the development trajectory of Kerala provides valuable lessons in prioritizing human-centered policies and social equity. However, achieving long-term sustainable development will have to be nurtured by addressing the prevailing vulnerabilities pertaining to environmental sustainability, investment attractiveness, and resilience in the labour market. With this strength and the implementation of the proposed strategies, Kerala will be able to continue being a model for inclusive and sustainable development within India and globally. This study underlines that economic development should not be an end in itself, but rather a vehicle for improving the well-being and opportunities of all citizens-a holistic approach to economic growth.

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Appendices

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