

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Diploma Thesis

Evaluation of Indian Economic Growth

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DIPLOMA THESIS ASSIGNMENT

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Thesis title

Evaluation of Indian Economic Growth

Objectives of thesis

The main objective of the thesis is to evaluate Indian economic growth with emphasis on the key determinants and limitations of Indian macroeconomic performance and to provide a comprehensive macroeconomic overview. Furthermore, the thesis is focused on the analysis of three main sectors of the economy, agricultural sector, industrial sector and service sector. In the framework of main objective of the thesis, the following interconnected partial goals are defined. The description of historical development on the Indian subcontinent with emphasis on the crucial events, which have influenced the economic performance. Further the analysis of demographic development, and analysis of contemporary political situation. Another partial goal is to introduce India in the context of international and regional economic organizations, and their impact on the Indian economic performance.

Methodology

To achieve the objective of this thesis, descriptive and comparative methods, time series and trend analysis, statistical hypothesis, and macroeconomic model are used. The theoretical part provides a background for a practical utilization of the knowledge obtained by the selective research of the secondary data sources such as professional books and other scientific resources, internet articles from the pertinent and valid websites dealing with the given problematics. In practical part of the thesis, main qualitative and quantitative approach techniques are used. For each macroeconomic indicator and prediction of its future values is used time series and trend analysis. Estimation of the coefficients of econometric models is the basis of regression analysis.

The proposed extent of the thesis

60 – 80 pages

Keywords

economic growth, evaluation, India, performance, sector of economy

Recommended information sources

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I declare that I have worked on my diploma thesis titled "Evaluation of Indian Economic Growth" 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 copyrights of any their person.

In Prague on 29th November 2017

Jiří Vostatek

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Evaluation of Indian Economic Growth

Abstract

The main aim of this thesis is to evaluate the economic growth of India and to provide a comprehensive macroeconomic overview of the country.

In the theoretical part are described theories of economic growth, such as classical, neo-classical, or endogenous growth theories. Furthermore, the thesis deals with selected macroeconomic concepts such as GDP, inflation, unemployment, and open economy. In theoretical part is also described the historical development of Indian subcontinent and membership of India in important regional economic groups.

The practical part is focused on the analysis of selected macroeconomic and socio-economic indicators and prediction of their future values. Moreover, the econometric model is built up to examine which of the selected macroeconomic and socio-economic indicators affect the GDP growth of India the most. The long-term relationship between GDP growth and selected variables is then detected by the cointegration testing. In the final part, the results of the diploma thesis are presented.

Keywords: analysis, economic growth, evaluation, exchange rate, development, GDP, India, inflation rate, macroeconomy, open economy, population, unemployment rate

Zhodnocení ekonomického růstu Indie

Abstrakt

Hlavním cílem této diplomové práce je zhodnocení ekonomického růstu Indie a zpracování makroekonomického přehledu země.

V teoretické části jsou popsány teorie ekonomického růstu, např. klasická, neoklasická, či endogenní teorie ekonomického růstu. Dále se práce zabývá vybranými makroekonomickými ukazateli jako je HDP, inflace, nezaměstnanost, či ukazatele otevřenosti ekonomiky. V teoretické části je dále popsán historický vývoj v oblasti Indického subkontinentu a členství Indie v důležitých regionálních ekonomických uskupeních.

Praktická část je zaměřena na trendovou analýzu vybraných makroekonomických a socioekonomických ukazatelů a predikci jejich budoucích hodnot. Dále je v praktické části vytvořen ekonometrický model zkoumající vliv vybraných ukazatelů na růst HDP. Dlouhodobý vztah mezi růstem HDP a vybranými ukazateli je pak testován pomocí kointegrace. V závěrečné části jsou představeny výsledky výzkumu této diplomové práce.

Klíčová slova: analýza, ekonomický růst, zhodnocení, směnný kurz, vývoj, HDP, Indie, míra inflace, makroekonomie, otevřená ekonomika, populace, míra nezaměstnanosti

Table of content

1	Introduction.....	13
2	Objectives and Methodology.....	14
2.1	Research Question.....	14
2.2	Objectives.....	14
2.3	Methodology.....	15
2.4	Research Limitations.....	16
3	Literature Review.....	17
3.1	Growth Theory.....	17
3.1.1	Classical Growth Theories.....	18
3.1.2	The Neoclassical Growth Model.....	19
3.1.3	Keynesian Growth Models.....	20
3.1.4	Endogenous Growth Theory.....	21
3.2	Macroeconomic Sectors.....	22
3.2.1	Household Sector.....	22
3.2.2	Business Sector.....	23
3.2.3	Government Sector.....	23
3.2.4	Foreign Sector.....	23
3.3	Selected Macroeconomic Concepts.....	23
3.3.1	Gross Domestic Product (GDP).....	23
3.3.2	Price Indexes.....	27
3.3.3	Gross National Product (GNP) and Gross National Income (GNI).....	29
3.3.4	Inflation.....	29
3.3.5	Unemployment and the Labour Market.....	32
3.3.6	The Open Economy.....	34
3.4	Historical Development of India.....	41
3.4.1	Ancient India.....	41
3.4.2	Medieval India.....	43
3.4.3	Early Modern India.....	44
3.4.4	Modern India.....	46
3.4.5	Current political situation.....	48
3.5	India in Context of Economic Groups.....	50
3.5.1	BRICS.....	50
3.5.2	SAARC.....	51
3.5.3	AIFTA.....	52
3.5.4	BIMSTEC.....	52

3.5.5	India and OECD.....	53
4	Practical Part.....	54
4.1	Trend Analysis of Indian Macroeconomic Indicators.....	54
4.1.1	GDP Growth	54
4.1.2	Inflation.....	66
4.1.3	Unemployment Rate and Labour Force.....	70
4.1.4	Exchange Rate	74
4.1.5	Trade Balance	76
4.1.6	Foreign Direct Investment	79
4.2	Trend Analysis of Socio-Economic Indicators	81
4.2.1	Demography.....	81
4.2.2	Urbanization.....	84
4.2.3	Education	84
4.3	Econometric Model.....	86
4.3.1	Economic verification.....	90
4.3.2	Statistical verification	91
4.3.3	Econometric verification.....	92
4.4	Cointegration.....	93
5	Results	95
6	Conclusion.....	98
7	References	99
8	Appendix.....	104

List of Pictures

Picture 1: Map of India	41
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List of Tables

Table 1: Pros and Cons of FDI Inflow with the Host Country	40
Table 2: Estimated Future Values of GDP per Capita	58
Table 3: GST Rates and Exclusions from GST Base	59
Table 4: Estimated Future Share of Agriculture in GDP	61
Table 5: Estimated Future Share of Industry in GDP	64
Table 6: Estimated Future Share of Services in GDP	66
Table 7: Inflation Rate – an increase in WPI with the base year	67
Table 8: Estimated Future Inflation Rate	69
Table 9: Estimated Future Unemployment Rate	72
Table 10: Estimated Future Exchange Rate	76
Table 11: Estimated Values of Indian Trade Balance	79
Table 12: Estimated Future Values of FDI inflows	81
Table 13: Estimated Future Values of Indian Population	82
Table 14: Estimated Future Values of Secondary Education	85
Table 15: Declaration of Variables	86
Table 16: Data Set	87
Table 17: Correlation Matrix with High Multicollinearity	88
Table 18: Correlation Matrix with First Differences	89
Table 19: Parameters estimated by OLS	90
Table 20: OLS and modified OLS, using observations 1996-2015	91
Table 21: Statistical verification	92
Table 22: Augmented Dicky-Fuller test for stationarity	94
Table 23: Engle – Granger, cointegration between y_1 and exogenous variables	94

List of Figures

Figure 1: Scheme of GDP Expenditure Approach calculation	25
Figure 2: Scheme of GDP Income Approach Calculation	26
Figure 3: Structure of Balance of Payments in India	35
Figure 4: GDP Annual Growth Rate 1995-2016	55
Figure 5: Trend Analysis of GDP per capita	57
Figure 6: Share of Agriculture in GDP in Selected Countries	60
Figure 7: Trend Analysis of Agriculture share in GDP	61
Figure 8: Share of Industry in GDP in Selected Countries	62
Figure 9: Trend Analysis of Industry share in GDP	63
Figure 10: Share of Services in GDP in Selected Countries	64
Figure 11: Trend Analysis of Services share in GDP	65
Figure 12: Inflation Rate Based on Consumer Prices	66
Figure 13: Trend Analysis of Inflation Rate	68
Figure 14: Unemployment Rate in Selected Countries	70
Figure 15: Unemployment Rate by the Gender	71
Figure 16: Trend Analysis of Unemployment Rate	72
Figure 17: Employment by Sector in 2010	73
Figure 18: Employment by Sector and Gender in 2010	74
Figure 19: Trend Analysis of Exchange Rate	75
Figure 20: Export and Import of Goods and Services	76
Figure 21: Trend Analysis of Trade Balance	78
Figure 22: FDI inflows in Selected Countries	79
Figure 23: Trend Analysis of FDI inflows	80
Figure 24: Trend Analysis of Indian Population	82
Figure 25: Age Structure of Indian Population	83
Figure 26: Trend Analysis of Secondary Education Enrolment	85
Figure 27: Test for Normality of Residuals	93

List of Abbreviations

BJP	Bharatiya Janata Party
BRICS	international summit of Brazil, Russia, India, China and South Africa
CEO	Chief Executive Officer
DIY	do it yourself
FAO	Food and Agriculture Organization
GST	goods and services tax
ICP	India Congress Party
ILO	International Labour Organization
IMF	International Monetary Fund
LCL	lower confidence level
UCL	upper confidence level
Un	United Nations
R&D	research and development
RBI	Reserve Bank of India

1 Introduction

"India is the cradle of human race, the birthplace of human speech, the mother of history, the grandmother of legend, and the great grandmother of tradition. Our most valuable and most astrictive materials in the history of man are treasured up in India only!"

Mark Twain.

India is a country with rich history and promising future. It is the seventh largest country by area (3.27 million sq. km), and second most populous (ca 1.3 billion) country in the world. After gaining its independence from the British crown in 1947, India became a socialist democratic republic, therefore sometimes referred as “the biggest democracy in the world”. India spreads itself mainly in the Indian subcontinent and is bounded by the Indian Ocean, Arabian Sea, and the Bay of Bengal. Continental borders share India with six states: Pakistan, China, Nepal, Bhutan, Myanmar, and Bangladesh. About 33% of the population live in the cities, as the most important are Delhi as a capital, and Mumbai as the financial centre of the country. Other major cities are Bangalore, Calcutta, Madras, or Hyderabad.

Possession of nuclear arsenal, together with one of the largest armies in the world, make India important regional power. Indian economic growth was ignited by the liberalisation processes and moving towards free-market economy during the 1990s of the 20th century. India was the seventh largest economy in the world by nominal GDP, and third largest country by purchasing power parity in 2016 (World Bank, 2017). It is also one of the fastest-growing major economies in the world with a projected average growth rate of 7.73% in the 2017-19 period (Nasdaq, 2017). Despite its continuing growth, India still belongs to the category of lower-middle income countries with 1,680 USD GNI per capita.

However, India faces many challenges on its way to economic growth. In 2011, only about 71% of the Indian population was literate. Furthermore, about 21% of the population lived under the international poverty line (1.25 USD per day) in 2011, and about 15% of the population was undernourished (FAO, 2015).

2 Objectives and Methodology

2.1 Research Question

The aim of the diploma thesis is to answer the following research question.

- What are the key factors influencing Indian economic growth?

The aim of the thesis is to describe factors influencing Indian economic growth. In particular, determine key macroeconomic and socio-economic factors and to predict their future development.

2.2 Objectives

The main objective of the thesis is to evaluate Indian economy growth with emphasis on the key macroeconomic determinants and limitations of Indian economic performance and to provide a comprehensive overview of the state of Indian economy. Furthermore, in the framework of the main objective of the thesis, the following interconnected partial goals are defined.

Firstly, the thesis focuses on trend analysis and estimation of future values of selected macroeconomic and socio-economic indicators. Secondly, based on the trend analysis, the econometric model will be set-up to examine how these selected macroeconomic and socio-economic indicators influence Indian economic growth. The third partial goal is the description of historical development in the Indian subcontinent with emphasis on the crucial events, which have influenced the economic performance. Another partial goal is to introduce India in the context of international and regional economic organizations.

2.3 Methodology

The theoretical part provides a background for a practical utilization of the knowledge obtained by the selective research of the secondary data sources such as professional books and other scientific resources, internet articles from the pertinent and valid websites dealing with the problematics of economic growth theories, basic macroeconomic concepts, Indian historic development, and Indian membership in regional and international economic groups.

The practical part is divided into three main chapters, analysis of Indian macroeconomic indicators, analysis of socio-economic indicators, and econometric model and cointegration testing of Indian economic growth.

Analysis of macroeconomic and socio-economic indicators focuses on GDP, Inflation, unemployment rate, exchange rate, trade balance, and foreign direct investment. For all macroeconomic and socio-economic indicators is used descriptive analysis based on literature and annual reports of World Bank, OECD, and United Nations. Furthermore, the trend analysis is used for estimation of future values (2017-2021) of GDP per capita, the share of agriculture, industry, and services in GDP, inflation, unemployment rate, exchange rate, trade balance, foreign direct investment, population growth, and education. The data for trend analysis is used in form of time series for period 1995 – 2016. Program MS Excel 2016 is used as a main statistical tool for trend analysis. Future values of selected indicators are estimated by forecast function of MS Excel 2016, using the method of exponential triple smoothing, which takes into account seasonality as well as trends.

Moreover, an econometric model is built to observe which of the selected macroeconomic and socio-economic indicators affect the economic growth of India the most. Economic growth is represented by GDP annual growth and chosen explanatory variables of the model are related to economic growth theories from the theoretical part. Chosen explanatory variables for the model are inflation, exchange rate, unemployment rate, population growth, trade balance, the inflow of foreign direct investment, life expectancy, secondary education enrolment and a number of new patents. For purposes of this thesis is used one-equation econometric model. For estimation of the relationship

between GDP growth and explanatory variables, and estimation of parameters of the model is used the technique of regression analysis called OLS (Ordinary Least Squares). Data used for econometric modelling are obtained from World Bank and OECD in form of time series for period 1995 – 2016. The degree of dependence between variables is measured by correlation index. The correlation matrix is used to analyse the intensity of correlation between variables. While high correlation index between GDP growth and each of the explanatory variables is desirable, high correlation index between explanatory variables is unwanted. Observed high correlation is then reduced by transformation of selected time series by the method of first differences. Furthermore, statistical analysis of variables is conducted within the econometric model.

As the econometric model displays the short-term relationship, the existence of a long-term relationship between GDP growth and each of the explanatory variables is detected by the analysis of cointegration. To be tested for cointegration, variables must meet the assumption of stationarity. The stationarity of variables is detected by the augmented Dicky-Fuller test. Furthermore, the cointegration testing between stationary variables is used Engle-Granger test. All calculations of the econometric model and cointegration testing are provided by SW Gretl.

2.4 Research Limitations

The research is limited by several factors. Firstly, the bias in the research can occur due to selected macroeconomic and socio-economic factors. However, the problematic of economic growth is more complex. Due to the scope of this diploma thesis and availability of the researched data, some indicators with significant impact on economic growth of India could have been omitted. Secondly, the thesis deals with a dataset with a sample of 22 observations from 1995 to 2016. Considering the size of the sample, it was problematic to find a statistically significant relationship between variables. Furthermore, due to the scope of the thesis only basic statistical methods, such as OLS, were used for the analysis of selected variables.

3 Literature Review

This part of diploma thesis deals with theories of economic growth, basic macroeconomic concepts, which are vital for evaluation of the development of Indian economy. The basic notions are gross domestic product, indicators of unemployment, inflation, the balance of payments, foreign exchange etc. Furthermore, geopolitical situation and history of the Indian subcontinent are identified.

3.1 Growth Theory

Economic growth can be described as the expansion of country's GDP or national output. (Samuelson and Nordhaus, 1998, p. 518) Since Adam Smith and his famous book *The Wealth of Nations* (1776), economists have tried to find a solution to the problematics of economic growth. As Helpman (2005) points out, even more than two hundred years later, the question of what makes some countries rich and other countries poor, has not been completely solved yet. Although several growth theories have been introduced since then, and selected theories are discussed throughout this chapter.

Economic growth is usually measured as the annual percent change of GDP. But what are the determinants of growth? Samuelson and Nordhaus (1998), point out following key four pillars of growth of any country, no matter how rich or poor the country is:

- Human resources (education, skill, labour force, discipline, motivation)
- Natural resources (fuels, land, minerals, quality of environment)
- Capital formation (roads, factories, machines)
- Technology (engineering, science, research and development, management)

The interrelationship of these determinants is often expressed in terms of an aggregate production function (APF), which relates outputs to the inputs and technology. The formula is as follows:

$$Q = AF(K, L, R) \tag{1}$$

Where

Q ... output,

K ... productive services of capital,

L ... labour inputs,
R ... natural resource inputs,
A ... level of technology,
F ... production function.

With the increase of inputs (capital, labour, or resources), it is expected to see an increase in the output, although output will possibly show diminishing returns to the additional input of production factors.

3.1.1 Classical Growth Theories

As a predecessor to the classical growth theories can be seen mercantilism. In mercantilism, a wealth of nation is determined by the accumulation of gold and surplus in trade. Followed by the real economic theories, to the most significant representatives of the classical period belong, Adam Smith, Thomas Malthus and David Ricardo. Both Smith and Malthus stressed the importance of land and population in economic growth. Adam Smith (1723-1790) in the *Wealth of Nations* argued several factors affecting economic growth. Gains in productivity can be achieved by the division of labour, income per capita is thus determined by the state of the skill, dexterity, and judgement. He also pointed out the role of the free market in determining supply and demand with his famous definition of the invisible hand.

David Ricardo and Thomas Malthus developed the classical model. David Ricardo (1772-1823) stressed out the way of income distribution among rent, profits and wages. Furthermore, he pointed out the benefits of international trade that each country can profit from cheaper imports relative to domestic production. In his theory of comparative advantage, Ricardo perceives free trade as crucial part of economic growth. Thomas Malthus (1766-1834) added the factor of demographic development, with the “gloomy” prediction of the population growing faster than the world’s capacity to feed itself. Malthus’ forecast was fortunately inaccurate, as he underestimated the role of technological development and capital investment in overcoming the limits of agricultural production. (Di Magliano, 2016; Samuelson and Nordhaus, 1998).

3.1.2 The Neoclassical Growth Model

In contrast to classical growth theories, the neoclassical (exogenous) growth theory considers how capital accumulation and technological change affect the economy. It is based on supply-side factors such as the size of the workforce, labour productivity, or factor inputs. As the key pillars of neoclassical growth theory are considered works of Robert. M. Solow and T.W. Swan both simultaneously published in 1956, therefore neoclassical growth model is often referenced as Solow-Swan model. (Samuelson and Nordhaus, 1998).

Robert Merton Solow was awarded the Nobel Prize in 1987 for his research of economic growth. In his famous paper *A contribution to the Theory of Economic Growth*, Solow found that the technological progress has been crucial input factor in western industrialized countries, that allowed long-run growth standard of living and real wages. His model is based on the production function, that displays constant returns to scale, which means that all inputs would double outputs. But this assumption was according to Solow too simplifying, because with one constant input (e.g. labour) and doubling other input (e.g. capital), the output (e.g. yield) is less than the double. The of the law of diminishing returns¹ is thus applied. (Di Magliano, 2016). As Di Magliano (2016) recaps, after analysis, Solow divided changes in labour productivity into two parts:

- Increase in the amount of capital per unit of labour
- Technological progress that includes improvement in the human factor.

Increase in the capital occurs, when the stock of capital grows faster than the labour force. With no technological progress, capital deepening will produce a growth of output per worker, of the marginal product of labour, and of wages. It will also lead diminishing returns on capital and then to decline in the rate of return on capital. (Samuelson and Nordhaus, 1998, p. 526).

To summarize neoclassical growth model, it uses an aggregate production function (APF) to display relationship of inputs and technology to the total potential GDP. The capital deepening creates economic growth, as workers can be more productive with

¹ Law of diminishing returns – economic law stating that if one input in the production of a commodity is increased while all other inputs are held fixed, a point will eventually be reached at which additions of the input yield progressively smaller, or diminishing, increases output. (Britannica, 2016)

increased capital. But because of diminishing returns to capital, countries (economies) sooner or later reach a point where an increase in capital no longer leads to economic growth. They reach a point called a steady state. To overcome this steady state, countries need to invest in the development of innovative technologies. Considering poor countries with less capital per person, they can grow faster, because each investment in capital produces a higher return than in developed rich countries (Di Magliano, 2016).

3.1.3 Keynesian Growth Models

Keynesian growth models are based on the work of John Maynard Keynes, which became contrary to Keynesian economics became the contrary to classical economics of Adam Smith and others. The main representatives of the Keynesian growth theory are Roy Harrod and Evsey Domar. In 1939, Roy Harrod released his *Essay in Dynamic Theory*, and Domar came up with his theory 1947. As both achieved same results through their work, their theories are presented in contemporary literature together as Harrod-Domar model.

The Harrod-Domar model stresses the importance of savings and investments as key determinants of economic growth. The model implies that a higher savings rate can lead to higher investment in physical capital, which leads to increase in the production of goods and services in a country, therefore increasing growth. The productivity of capital investment, also known as capital-output ratio shows how much capital is needed to produce a dollar's worth of output. It reflects the efficiency of using machines. This efficiency means that a lower capital-output ratio leads to higher economic growth since fewer inputs generate higher outputs (Intelligent Economist, 2017).

Although the Harrod-Domar model brings dynamization to the growth, and helps to explain how economic growth has occurred and how it may occur again, there are some key limitations. Agarwal (2017) points out following limitation:

- The model implies that growth is the same as development, although development includes improvements in socio-economic factors such as health, education, or literacy. Development alleviates people from low standards of living in better conditions.
- The model contains acquiring of foreign aid, although it can be difficult to pay back.

- In developing countries, investment in physical capital is not that efficient, due to corruption, wastage, or the low skilled workforce.
- Families in developing countries tend to spend the additional income, rather than to save it.
- Availability of increased savings may not translate into extra funds because of undeveloped financial system

3.1.4 Endogenous Growth Theory

Since the end of 20th century, economists started to be unsatisfied with Solow's exogenous theory. The endogenous theory thus understands economic growth as a result of endogenous (internal) forces, not exogenous (external forces). According to this theory, investment in human capital, innovation, and knowledge are the main contributors to the economic growth. Endogenous growth policy also focuses on positive externalities and a knowledge-based economy that lead to economic development. In addition, endogenous growth theory states, that in long run, the growth of the economy hinges on policy measures, such as subsidies for R&D, or education.

One of the key differences between exogenous growth theory and endogenous growth is the new concept of capital. Theory of endogenous growth is based on wider access to the capital, which comprises beside physical as well as human capital (skills and knowledge of workers). As Di Magliano (2016) points out, human capital has increasing rates of returns and hence altogether there are constant returns to capital, which lead to the situation, that countries can never reach a steady state. In the endogenous growth theory, growth does not slow with deepening capital but depends on types of invested capital.

The endogenous growth theory is based on works of Paul Romer (1986), Robert Lucas (1988), and others. Romer in his article *Increasing Returns and Long-Run growth* laid the foundations of the endogenous theory. Romer described so-called positive externalities as increasing revenues from a range of investments into human capital. Capital is then created from two parts: physical capital and knowledge-based capital. Physical capital demonstrates decreasing revenues from range, whereas investments from knowledge-based human capital demonstrate constant or increasing revenues (Di Magliano, 2016).

Abovementioned growth theories, from neoclassical to endogenous, attempt to bring complexity in the model of economic growth. The question is, in what extent are they able to fulfil this commitment. According to Solow's exogenous growth model, economies with same preferences should achieve same prosperity. But in reality, it has been proven that only differences in ownership of capital are not satisfying to explain different standards of living and different development of countries. That is why endogenous growth theories besides land and capital add innovations and human capital as a key endogenous determinant of economic growth. The endogenous growth theory has been later developed by other economists such as Grossman and Helpman (1991), who added imperfect markets and research and development to the growth model. Endogenous theories have revived interest in the theory of economic growth and search of new option of interpretation of human capital and technological progress as a source of economic growth.

3.2 Macroeconomic Sectors

The macroeconomic theory includes four basic sectors, household sector, business sector, government sector, and foreign sector. All these sectors are interconnected; thus, they influence each other. (Brčák and Sekerka, 2010, p.7)

3.2.1 Household Sector

Households are determined as subjects, whose function is consumption, simply put, the household sector includes all consumers, every member of society. Households are owners of the production factors (labour, land, capital), therefore these factors are a source of income intended to consumption. The income of the households consists of two types. The first type is incomes from the sale of the production factors, the second type is transfer income (Brčák and Sekerka, 2010).

The household income can be divided into personal income and disposable income. Disposable income is thus the personal income minus taxation plus transfer payments.

3.2.2 Business Sector

The business sector contains the private, profit-seeking companies in the economy, that combine scarce resources into the production of wants-and-need satisfying goods and partnerships. It includes Proprietorships, partnerships and corporation. Part of the production is kept by the companies as an intermediate product. Business sector income thus consists of household expenditures (C), capital expenditures (I), and government expenditures on goods and services (G).

3.2.3 Government Sector

Government sector includes all government entities that impose resource allocation decisions, that might not be made otherwise, on the rest of the economy. Income of this sector came mainly from the taxation of other subjects in the economy. The government expenses consist of purchase of goods and services (G) and transfer payments (TR).

3.2.4 Foreign Sector

This sector is comprised of everyone and everything outside the political boundaries of the domestic economy. It includes households, businesses, and governments in other countries. Influence of the foreign sector on the economy takes effect through import and export of goods (Brčák and Sekerka, 2010 p.7-9).

3.3 Selected Macroeconomic Concepts

3.3.1 Gross Domestic Product (GDP)

Gross Domestic Product is considered as one of the most important indicators to measure the performance of the economy of the country. GDP is defined as the total value of all the final goods and services produced by all enterprises (both resident and non-resident) within the domestic territory of a country in a certain year. (Agarwal, 2010, p. 21). Internationally, for better comparison of two or more countries can be used GDP recalculated per capita (Brčák and Sekerka, p.9).

When working with macroeconomic indicators, it is important to know whether these indicators are calculated at current (nominal) prices² or at constant prices³. Therefore, Nominal GDP is the total value of goods and services calculated at current prices and Real GDP is the total value of goods and services at constant prices. (Agarwal, 2010, p. 1)

Measurement of GDP

Gross Domestic Product can be measured by three approaches. The output approach, the expenditure approach and the income approach. As Agarwal (2010, p.28) points out, all three approaches should theoretically lead to the same result, because total expenditures on goods and services (GNE) must be equal to the total income paid to the producers (GNI), and that must be equal to the value of the output of goods and services (GNP).

The output approach (product method)

GDP is calculated as the sum of gross value added by institutional sectors (units) that are resident in the economy (in different economic activities) plus taxes on products and import (VAT, excise tax and customs duties) fewer subsidies on products (Brčák and Sekerka, 2010) The calculation scheme is, therefore:

GDP = production

– intermediary consumption

+ taxes on products and imports

– subsidies on products.

(2)

The Expenditure Approach

Calculation of GDP by expenditure approach is based on expenditures incurred in a given period by institutional units that are resident in the economy. GDP can be classified into four constituent parts:

² Current prices – prices in the value of currency for the particular year

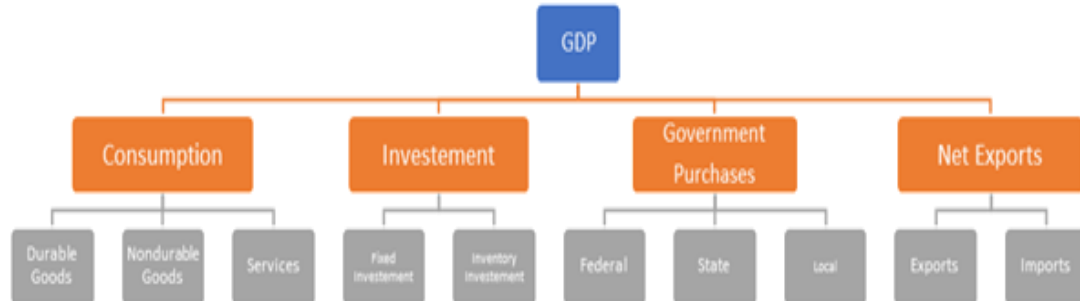
³ Constant prices – prices in the value of a particular base year (e.g. data for years 1990–2010 based on prices of the year 2000)

- **Private Consumption Expenditure** (C) includes goods and services purchased by households.
- **Investment Expenditure** (I) consist of goods and services bought for use in the future.
- **Government purchases** (G) are goods and services purchased by the different governments. It is to be considered that transfers to the individuals e.g. social security payments are not included in the GDP whereas they are not payments for any goods or services (Agarwal, 2010 p 29).
- **Net exports** (NX) are the difference between the value of goods and services imported to the country and value of goods and services exported to other countries.

Hence the calculation scheme is

$$GDP = C + I + G + NX \quad (3)$$

Figure 1: Scheme of GDP Expenditure Approach calculation



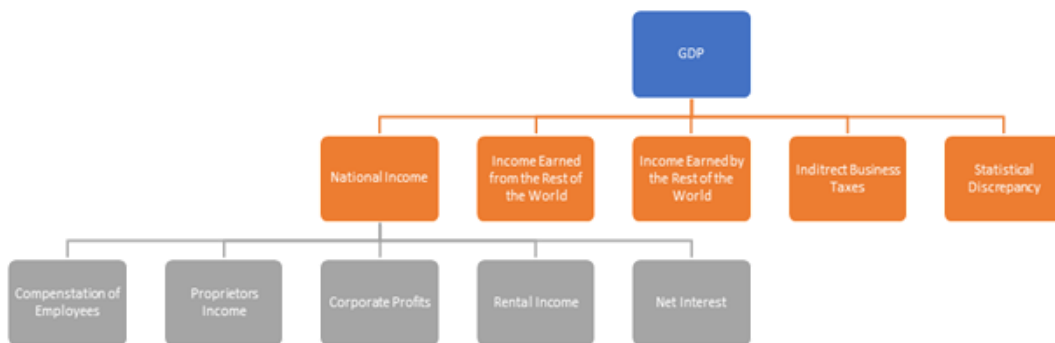
(Source: Adapted from Maitah, 2010)

The Income Approach

GDP calculated by the income approach is based on the sum of income of those institutional units who are directly involved in the production of goods and services in a given period. Hence the calculation scheme is:

$$\begin{aligned} \text{GDP} = & \text{employment income in the form of wages and social benefits} \\ & + \text{taxes on production and import} \\ & - \text{subsidies on production and import} \\ & + \text{mixed-income received from self-employment} \\ & + \text{total profit received by companies from economic activities} \end{aligned} \quad (4)$$

Figure 2: Scheme of GDP Income Approach Calculation



(Source: Adapted from Maitah, 2010)

Problems of GDP measurement

Dornbusch and Fischer (2005, p.35) point out, that although GDP data are usually used as a measure of welfare, or economic output, they are not flawless. Four major problems of measurement of GDP are emphasised.

- Some outputs are hardly measured because they are not traded in the market. These can be volunteer works, services provided by the government, or DIY home activities.

- It is problematic to measure correctly improvements of some goods. For example, quality of electronics such as computers or mobile phones has improved, but the price has fallen.
- There are parts of economic activities that cannot be counted in GDP. These activities are usually described as the underground economy or shadow economy. The ratio of the underground economy is difficult to measure, it is generally estimated. Cases of shadow economic activity are very diverse, it can be illegal drug dealing, illegal gambling, working while collecting unemployment benefits, or just selling home-grown vegetable for cash. According to World Bank (2010), a country with a lowest estimated rate of the underground economy in the year 2006 was Switzerland with 8.2% of GDP, in India shadow economy accounted for more than one-fifth of the GDP with 21.1% of GDP.

The environmental pollution and degradation are not considered in the measurement. Especially developing countries are affected, and environmental issues can reduce the annual growth rate for a few percent.

3.3.2 Price Indexes

The influence of price on the economic indicators is measured by the price indexes. The value of price index thus indicates how prices have changed relative to the base year. For calculation of price indexes, is important to define a group of items, sometimes called baskets. Three following price indexes are usually used: the GDP deflator, the consumer price index (CPI), and producer price index (PPI) (Brčák and Sekerka, 2010, p.25).

The GDP Deflator

The GDP deflator is a price index that involves all goods and services in the GDP. It is expressed as the ratio of nominal GDP in a given year to real GDP of that year. Because of the involvement of all goods and services in GDP, the GDP deflator is widely used for measuring of inflation (Dornbusch and Fischer, 2005; Brčák and Sekerka, 2010).

The formula is thus as follows:

$$GDP\ deflator = GDP\ current\ prices / GDP\ base\ year\ prices = (\sum p_t q_t / \sum p_0 q_t) \times 100 \quad (5)$$

Where

q_0 ... base year quantities of goods,

p_0 ... base year prices,

q_t ... current year quantities of goods,

p_t ... current price.

The Consumer Price Index (CPI)

The CPI measures the impact of price changes of a basket of goods and services purchased by households. This index differs from the GDP deflator because it involves specific basket of goods and services, which is the same every year, while the GDP deflator depends on all goods and services what produced each year in the economy, which can differ from year to year. Another difference is that CPI already includes prices of import and export, whilst the deflator includes only prices of goods produced in the given country. CPI is another index broadly used for measuring of inflation (Dornbusch and Fischer, 2005; Brčák and Sekerka, 2010). The formula is as follows:

$$CPI = (\sum p_t q_0 / \sum p_0 q_0) * 100 \quad (6)$$

Where

q_0 ... base year quantities of various good,

p_0 ... base year prices,

p_1 ... current price.

The Producer Price Index (PPI)

The PPI (or the WPI whole price index) is similar to the CPI, as it measures prices certain basket of goods. The difference is in the content of the basket because PPI includes raw materials, intermediate and final goods. Another difference is that CPI measures prices for which households actually spend their income, which is retail level, the PPI is constructed on the producer level, usually of the price of the first transaction. PPI,

therefore, serve as one of the business cycle indicators, observed by policymakers. (Dornbusch and Fischer, 2005; Brčák and Sekerka, 2010). The PPI is then calculated same way as the CPI.

3.3.3 Gross National Product (GNP) and Gross National Income (GNI)

Gross National Product can be considered as one of the most common alternative macroeconomic indicators (Brčák and Sekerka, 2010, p. 19). Compared to the GDP, GNP is defined as the value of all final goods and services produced in the specific period of time by all citizens of the country, regardless their whereabouts. It is, therefore, an income produced and earned by the all citizens of the nation (Agarwal, 2010, p. 21).

Gross National Income is used to make a comparison of GNP between countries with considering currency exchange rate, using an average of currency exchange rates over a given period adjusted for rates of inflation. Thus, GNI can be defined as a measure to make international comparison of output. When GNI is divided by the number of inhabitants, the result is called GNI per capita (Maitah, 2010).

3.3.4 Inflation

Inflation is defined as a persistent and an appreciable increase in general level of prices. In other words, decrease in the purchasing power of money. A sustained inflation takes place when general price level continues to rise over a fairly long period of time. The amount of goods and services available to be purchased for a monetary unit is decreased by the inflation, but the amount of goods and services available to be purchased by the income remains unchanged. Except for increase of the level of prices, inflation also leads to increase of incomes, rents, interest rates etc.

The opposite of inflation is deflation. It is a situation where exist a persistent decrease in the general level of prices, which leads to a decrease in the purchasing power of money. In addition, disinflation is a decrease in the rate of inflation at which prices are rising. (Agarwal, 2010, Brčák and Sekerka, 2010)

Measurement of inflation

The most usual form of the measurement of inflation is through the rate of inflation, which means a change in the price index compared to the previous year and expressed as a percentage. The formula is then as follows:

$$\pi_t = (P_t - P_{t-1} / P_{t-1}) * 100 \quad (7)$$

Where,

π_t ... rate of inflation,

P_t ... price index in period t,

P_{t-1} ... price index in the preceding year.

As far as the price index is considered, several price indexes can be used, although the Consumer Price Index (CPI) and Wholesale Price Index (WPI) are most often used. Consumer Price Index is a time series index. It is weighted average⁴ of prices of a specified basket of goods and services purchased by the consumer. The Wholesale Price Index (sometimes referred to as the Producer Price Index) is used to measure the change in the average price of goods traded in wholesale market. (Agarwal, 2010; Brčák and Sekerka, 2010).

Furthermore, inflation can be measured by the Gross National Product Deflator (GNP Deflator), which expresses the changes in the prices of all goods. GNP deflator can be thus obtained as follows:

$$\text{GNP Deflator} = \text{Nominal GNP} / \text{Real GNP} \quad (8)$$

where,

nominal GNP ... GNP at current prices,

real GNP ... GNP at constant prices.

⁴ Weighted average is a method of computing mean by giving values in a data set more influence according to some attribute of the data.

The cause of inflation

Increase in physical volume of money within the economy is the cause of inflation. The amount of money depends on the level of the development of given economy. More production requires more money. Inflation however exists when increase in volume of money is not equal to the volume of production in the economy. The volume of money is therefore controlled by the central banks.

The effect of inflation

As Agarwal (2010, p.279) points out, two types of effects of inflation exist, the economic and the social. In the economic effect of inflation Agarwal highlights, that considering income distribution, some gain, while others lose due to inflation. Those who gain are producers, manufacturers and farmers, as their income is derived from profits. Other group who gains due to inflation are those investing in equities and debtors experiencing a decrease in the burden of the interest owed by them. The losers are especially unorganized workers and agricultural labourers, those investing in bonds, creditors and recipients of income from rent. On the contrary, as far as the output and employment are considered in the short run, unanticipated inflation will lead to an increase in employment and therefore in the output. It can be also argued, inflation leads to better allocation of resources and thus increase in outputs, in short run. Inflation means depreciation of savings (Brčák and Sekerka 2010) and wages lag prices. This leads to big profit margins and shift of resources away from the wage goods to the capital goods. The result is thus increase in productive capacity and therefore economic growth. According to Agarwal (2010) and other economists, the moderate inflation is beneficial to economic growth. On the other hand, hyperinflation or inflation which occurs rapidly, can discourage savings and obstruct economic growth.

Brčák and Sekerka (2010) point out that the main social effect of inflation are negatively affected wages, as their purchase power decrease. Inflation does not affect owners of the tangible assets, because price of the properties increases along with the inflation. It could be then argued, that inflation affects more poor part of the population and makes those poorer and on the other hand works in favour of the richer part of the population (Agarwal, 2010).

3.3.5 Unemployment and the Labour Market

The unemployment usually goes side by side with the inflation. In the real world, full employment is impossible, therefore the amount of labour and capital are important explanatory variables for total production and GDP. The amount of labour is connected to the important macroeconomic variable – the unemployment rate (Jochumzen, 2010; Agarwal, 2010).

According to International Labour Organization (ILO), unemployed is a person above specified age who during the reference period was without work, not in paid employment or self-employment. He or she was currently available for work and was seeking work – had taken specific steps such as registration at a public or private employment exchange, application to employers, checking worksites etc.

Employed is person who during a specified brief period such as one week or one day performed some work for wage or salary in cash or in kind, had a formal attachment to the job but was temporarily not at work, performed some work for profit or family gain in cash or in kind, was with an enterprise (OECD, 2017).

All unemployed and employed people form a labour force. Unemployment can be thus defined as follows:

$$\text{Unemployment} = \text{Labour Force} - \text{Number of people employed} \quad (9)$$

The amount of unemployment in each country is then measured by the unemployment rate.

$$\text{Unemployment rate} = U / L \quad (10)$$

Where,

U ... total number of unemployed persons

L ... total labour force.

Above mentioned way of unemployment rate measurement can be although biased. It does not include persons working “unwillingly” for a less working hours. Even seasonality is hard to include in this measurement etc. Further issue is that in different

countries are used different statistical methods for gathering information about the employment (Brčák and Sekerka, 2010, p. 94).

It is important to mention, that in the market economy there always exists an unemployment. This phenomenon is called the natural rate of unemployment. It is the average rate of unemployment around which any economy fluctuates in the long run (Agarwal 2010).

Unemployment classification

Different types of unemployment can be distinguished. The most common types are following:

- Frictional unemployment
- Structural unemployment
- Cyclical unemployment
- Seasonal unemployment

Frictional unemployment exists, because labour market is in constant movement. People are temporarily unemployed because they are in transition between jobs or they just entered the labour market. Friction unemployment is a part of the natural unemployment rate in a market economy and is short in duration.

Structural unemployment emerges when individuals are unemployed, because of insufficient skill, or their skill are no longer in demand in the area where they live. Structural unemployment is the result of expansion of one branch of industry and recession of others. This kind of unemployment usually lasts longer than the frictional and may require the unemployed to seek retraining or to move.

Cyclical unemployment is connected to recession in economy or the cyclic fluctuations of economy. The real rate of unemployment is above the natural rate of unemployment.

Frictional and structural unemployment are both parts of the natural rate of unemployment and can be called as equilibrium unemployment or as a voluntary unemployment, while cyclical unemployment is sometimes described as involuntary.

Seasonal unemployment is the result of seasonal demand for work. The most common fields for seasonal working are agriculture, building industry etc. Seasonal

unemployment is part of the friction unemployment; therefore, it is part of the natural rate of unemployment (Brčák and Sekerka, 2010; Jochumzen, 2010).

Duration of unemployment

The duration of unemployment is defined as the average time for which person stays unemployed. Length of the duration of unemployment is also affected by the structural characteristics of labour market (Brčák and Sekerka, 2010; Agarwal, 2010).

Frequency of unemployment

The frequency of unemployment is expressed by the average number during a given period, in which the workers become unemployed. The frequency depends on several factors, the extent to which demand for labour varies with companies in different branches of the economy (Brčák and Sekerka, 2010). Agarwal (2010) adds that the frequency depends also on the growth rate of the labour force. The rate of unemployment is higher when the growth rate of labour force elevates and vice versa.

3.3.6 The Open Economy

As Brčák and Sekerka (2010, p.233) point out, the open economy represents connection of domestic economy with the foreign countries via trade with goods and services, and financial flows. While trade with goods and services is based on export and import, the financial or capital flows are based on allocation of assets in the most profitable countries by the investors. Thus, with increasing globalization, increase reciprocal interconnection of national economies.

Balance of Payments

The balance of payments expresses the economic transactions of the residents of a country with the rest of the world. Balance of payments includes two main accounts, the current account and the capital account, but usually includes also financial account, or errors and omissions.

Trade in goods and services, and transfer payments are recorded in the current account. Services payments include cargo, interest payments and royalty payments. In addition, services include net investment income. Transfer payments consist of all

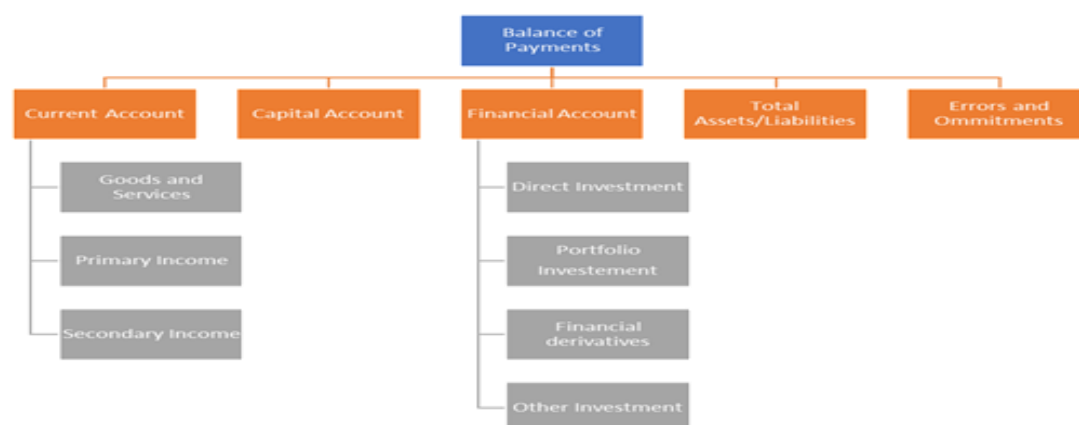
movements of goods and money, it can be contribution of international organizations, money send by foreign workers back to their home country etc.

The capital account records sales and purchases of stocks, bonds, and land. It includes all transactions connected to migration of the population, transfer of ownership rights, debt forgiveness and other capital transfers.

In the financial account are included changes in financial assets of government, banking, non-banking subjects and other subjects. These are direct investments in and outside the country, portfolio investments, financial derivates and other investments.

Errors and omissions may arise, because of the need of equability of accounts. Therefore, many transactions are only estimated, and errors can occur (Brčák and Sekerka, 2010).

Figure 3: Structure of Balance of Payments in India



(Source: Adapted from Reserve Bank of India, 2016)

Import and Export

Imports are goods which are bought from other countries. Import itself depends on domestic income, therefore import can be expressed as function of domestic income, price level expressed in domestic currency, price level expressed in foreign currency and exchange rate. The formula is then as follows:

$$M = M(Y, P_D, P_F, E_{D/F}) \quad (11)$$

Where,

M ... import,

Y ... domestic income,

P_D ... price level in domestic currency,

P_F ... price level in foreign currency,

$E_{D/F}$... exchange rate.

If price levels in domestic and foreign currency and exchange rate are constant, then import can be expressed as follows:

$$M = M_a + mY \quad (12)$$

Where $m > 0$.

Exports are goods which are made in one country and sold to other countries. Export of domestic country is considered to remain unchanged independently on domestic product (income), thus export can be described as an autonomous value. Export can be also described as function of the foreign revenue. Formula is as follows:

$$X = X(Y_F, P, P_F, E_{D/F}) \quad (13)$$

Where,

X ... export,

Y_F ... foreign income,

P ... price level in domestic currency,

P_F ... price level in foreign currency,

$E_{D/F}$... exchange rate.

Export can be also described as foreign import, therefore can be expressed in equation as function of foreign import. The formula is as follows:

$$X = M_{aF} + m_F Y_F \quad (14)$$

Where $m_F > 0$.

Net export indicates the surplus of exports over imports and depends on income. Thus, net export is expressed as follows:

$$NX = X - M \quad (15)$$

Where,

NX ... net export,

X ... export,

M ... import.

Exchange Rates

The exchange rate can be described as the price of one currency unit in terms of another currency (Jochumzen, 2010, p.15). The exchange rate is important, whereas it affects import and export and connects internal economics to the outside world. In most countries, the exchange rate is expressed by the foreign currency as the base. For example, in India, the Euro exchange rate would be described as 65 Indian Rupees (INR) per U.S. Dollar (USD). This way of determining the exchange rate is called the direct method. If the exchange rate is expressed by the domestic currency as the base, it is called the indirect method. Two types of exchange rate systems can be distinguished, fixed exchange rate system and floating exchange rate system (Brčák and Sekera, 2010; Jochumzen, 2010).

In a fixed exchange rate system, central banks of foreign countries are prepared to buy and sell their currencies at a fixed price in terms of some other currency (Dornbusch and Fischer, 2005, p. 152). But if the bank wants to keep the exchange rate without a change, it must necessarily hold a certain amount of foreign currency. This currency can be then provided in exchange to domestic currency. Such behaviour of the central bank is titled as intervention, the range of intervention is expressed by the balance of payments and can last as long, as the central bank has the sufficient reserves. Fixed exchange rate was used by the major countries after the World War II until the 1973 (Bretton-wood system, where each currency in the system was fixed to U.S. Dollar) to ensure development of world economy after the War, when the system collapsed, many countries has changed their system to flexible. (Brčák and Sekera, 2010; Dornbusch and Fischer, 2005).

In flexible (floating) exchange rate system, the central bank leaves the exchange rate to adapt to supply and demand for foreign currency. Floating exchange rate can be

divided into two types, clean floating and dirty floating. In the system of clean floating, the central bank steps aside and leave exchange rates to be determined loosely on the foreign markets. In this case, the national bank does intervene at all and transactions with reserves equal to zero. But most central banks in most countries somehow intervene by buying and selling of foreign currencies, which leads to influencing of exchange rate of the domestic currency. This type is then called a dirty floating (Brčák and Sekerka, 2010; Dornbusch, and Fischer, 2005)

Exchange rate is formed according to demand and supply in the foreign exchange market. Generally, demand and supply of the currency of given country is determined by the factors, which influence macroeconomic development of the country. These factors are, the development of international trade, equality of balance of payments, inflation, growth of the domestic production, interest rates, or political situation etc. Other factors influencing the exchange rate are the future expectations, or speculation on the foreign exchange market (Brčák and Sekerka, 2010).

As Dornbusch and Fischer (2005) point out, terminology can be really confusing in case of exchange rate and its system. Especially terms, depreciation, appreciation, devaluation and revaluation. Devaluation means, that in the fixed rate regime, the price of foreign currency is increased by the official action. In reality, with devaluation of currency, foreigners pay less for the devaluated currency and vice versa, residents of the devaluating country pay more for foreign currency. During devaluation, the exchange rate ($E_{D/F}$) is increasing. The opposite of devaluation is the revaluation.

Under the flexible exchange rate regime, any changes are referred to as depreciation and appreciation of the currency. Depreciation is happening, when domestic currency becomes less expensive in terms of foreign currency. Opposite of the depreciation is the appreciation, domestic currency appreciates, when it becomes more expensive in terms of foreign currency.

If the central bank defines a fluctuation range of exchange rate, then the movement of exchange rate within this range is perceived as appreciation or depreciation and if the movement is outside this range, it is called devaluation or revaluation (Brčák and Sekerka, 2010)

Foreign Direct Investment

Foreign investments can be classified in two ways: direct investment and portfolio (indirect) investment. Portfolio investment involves transactions of financial assets (bonds, or stocks). In this case investors lend their capital to maximise profit and minimise risks. In contrary to FDI, investors do not aim to the control of the foreign company (Lacina, 2001).

Foreign Direct Investment (FDI) is defined as an investment made by company, individual in one country in business interests in another country. The purpose of FDI is to gain and equity interest sufficient to provide control of a company. (Investopedia, 2017). Furthermore, OECD (2008) describes FDI as a key element in international economic integration (globalisation), which provides means for stable long-lasting links between economics. FDI usually involves capital investment, but also technology, or provision of management.

A direct investment relationship is recognised, when investor acquires 10% or more of the ordinary shares or voting power of a foreign enterprise. FDI can be categorised into three following types: horizontal, vertical, and conglomerate (Investopedia, 2017).

- In horizontal type of FDI the investor establishes the same type of business in foreign country as in its domestic country.
- Vertical FDI is related to the different type of business established by the investor in foreign country, which is however connected to its core business in a home country.
- A conglomerate FDI is not connected to the core business of the investor at all. Investor thus enters the industry without any previous experience. Therefore, this type of investment usually takes the form of a joint venture with company already operating in the industry.

Although, FDI is usually largely supported by the governments, there are both positive and negative impacts of FDI inflows on the host country. Czinkota (2015) points out, that on one hand, host country appreciates various economic contributions, on the other hand, investments from abroad increase worries of dependence, or interference.

Table 1: Pros and Cons of FDI Inflow with the Host Country

PROS OF FDI INFLOW	CONS OF FDI INFLOW
Improved capital flows	Low levels of R&D
Technology transfer	Risk of increase capital outflows
Regional development	Stifling of domestic competition
Increased competition	Erosion of host culture
Favourable balance of payments	Disruption of domestic business practices
Increased employment opportunities	Risk of interference by foreign governments

Source: Adapted from Czinkota, 2015)

3.4 Historical Development of India

Modern India occupies most of the South Asia. Almost one third of its frontier is coastline, in the rest, India borders with six countries: Pakistan, Nepal, China, Bhutan and Myanmar. Indian subcontinent has very rich and colourful history. Next chapter attempts to summarize most important historical events that shaped the face of India from ancient history to these days modern India. History of Indian subcontinent encompasses thousands of years of civilization. First evidence of human activity in the region even dates more than 500,000 years back to the past (Arnold, 2010, p.39). From Indus Valley Civilization, that eventually blended into Indo-Aryan Culture and Vedic Civilisation and rise of Buddhism, Hinduism and Jainism. Rise of Muslim dominions during Medieval period, incoming European merchants followed by the British colonisation, fights for independence and today's modern Indian Republic.

Picture 1: Map of India



(Source: international.gc.ca 2017)

3.4.1 Ancient India

Indus Valley Civilisation (3300 BCE – 1750 BCE), one of the world's oldest, together with Mesopotamia and Pharaonic Egypt is considered as a cradle of civilisation. The civilisation was located primarily around Indus River in the north-western part of

today 's modern India and Pakistan. The peak of the civilisation is dated between 2600 – 1900 BCE and is characterised by the cities built of bricks, drainage system alongside the roads or multi-storied houses. It is known, that inhabitants of Indus Valley had basics in metallurgy and handicraft and could produce copper or bronze.

When Aryan tribes from the northwest infiltrated the Indian subcontinent, and gradually merged with the earlier Dravidian inhabitants, they created the classical Indian culture, the Vedic society (ca. 1750 BCE – 600 BCE) (CIA, 2017). Name of the civilisation is derived from the texts of Vedas, which were written in the Vedic Sanskrit and are still sacred to Hindus. Early Vedic society is called Rigvedic, according to the Rigveda, the oldest Vedic text in which is the society described. At the end of the Rigvedic period, the society was mainly agricultural and started to be stratified in to four social classes called Varnas. Thus, Vedic can be perceived as synonym to Hinduism, the main religion in India that has evolved from the Vedas. The two well-known great epics were written during this period, the Ramayana and Mahabharata (KnowIndia, 2017).

Another occurrence that has shaped the future development of the world happened during the age of early empires between 7th and 6th centuries BCE. In 560 BCE Siddhartha Gautama, later known as Buddha, founder of Buddhism, was born. His philosophical system into a great culture throughout the southern and eastern India (KnowIndia, 2017).

The period between classical and on the verge of medieval age (ca. 300 BCE – 500 CE) among others, under the rule of the Gupta dynasty, has been described as the Golden Age of Indian History. Guptas wealth was engaged to sea trade with western countries, which provided exceptional wealth and prosperity. It is estimated, that during this period, economy of India has been the largest in the world, possessing around one-quarter of world's wealth (Arnold, 2010). At the end of the Gupta empire between the close of 5th and 6th century CE, various small independent kingdoms had arisen and attracted foreign invasions.

3.4.2 Medieval India

Medieval period in India is strongly associated with the rise of Islamic influence over the subcontinent. Islam initially entered the South Asia in the first century after the death of the prophet Muhammad. At the end of the 12th century CE in 1192 CE the second furious battle of Terrain took place and laid the foundation of Muslim rule in northern India.

The most important empire of this period and one of the greatest empires ever was the Mughal Empire. In 1526, Babur became first Mughal emperor of India, when he conquered territory of today's Afghanistan, Pakistan, Bangladesh and India. In following decades and centuries, several emperors ruled over the Mughal Empire. Under the rule of Sher Shah Suri (1540-1545) efficient public administration had been set up, roads were built, or the currency was changed to silver coins called Dam. He even provided justice to common men. Ruler Akbar (1556-1605), proved himself as capable organizer and administrator. He set up many institutions that became foundations of later administrative system. He is known also for his liberal policies towards non-Muslim population. In 1628 Shah Jahan, which means Emperor of the World in English, took over the Mughal Empire. During his reign the Empire experienced unique development of arts and culture. Shah Jahan is also known as the "architect king", as he had built world famous Red Fort in Delhi as illustration of achievements of civil engineering and arts of that time. But his greatest achievement is the Taj Mahal in Agra, the white marble mausoleum built for his late wife Mumtaz Mahal. The Mughal Empire started to disintegrate after the death of ruler Aurangzeb in 1707. Under him, the Empire reached its peak in the matter of area. Unfortunately, he kept his five sons away from the court, incapable to face the challenges from Marathas and the British.

Another significant occurrence of the medieval period is the rise of the Sikh power. Sikhism was founded at the beginning of the 16th century by Guru Nanak Dev around the Punjab region in the northeast of India. Sikhism is therefore one of the youngest religions in the world, based on faith and meditation on the name of one creator. Sikhs are well-recognisable for the five symbols they wear, Kesh (uncut hair), Kara (a steel bracelet), Kanga (a wooden comb), Kaccha (cotton underwear), and Kirpan (steel sword). These five

symbols were introduced to identify members of the community, and bound them together (BBC, 2009; KnowIndia, 2017).

3.4.3 Early Modern India

While the fall of the Mughal Empire indicates the end of the medieval era of Indian history, the arrival of the British indicates the beginning of the Indian's modern history. The foundation stone for the British domination over the India was laid in 1617, when British East India received permission to trade from the Mughal Emperor Jahangir (Ashok 2012, p.83). In 1757, after the decisive battle of Plassey, the British achieved political power in India, when the army of East India Company defeated the Nawab of Bengal, the last of the Mughal Empire and their French allies. In the following years, the British annexed Punjab, Peshawar and tribes in the north-western India, and by the 1856, the conquest of the India was established. But as a result, with growing discontent of the population from the peasantry to intellectuals, the rebellion against British broke out. Of

The rebellion, also known as the Indian Mutiny started in 1857 as the revolt of the military soldiers, but soon spread out over the country. The British though crushed the uprising within a year. As a result, the rule of East India Company over the country came to an end, when in 1858, queen Victoria declared that India would be governed in the name of the British Monarch through the Secretary of State. The following period between years 1858 and 1947 is known as the British Raj (KnowIndia, 2017).

Regarding the economy during the British rule, the two opposite opinions have occurred. While the economic stagnations during the British rule is attributed to over population, religion, caste, or social attitude on one hand, the other opinion is that stagnation is due to outlet of country's wealth and resources to the Britain. Which created all possible obstacles to the development. In Agriculture new land systems were introduced. In Bengal and neighbouring areas, new Zamindari system was introduced. Under this system, all peasants lost their ownership rights over their own land. In the other system called Ryotwari, the land stayed in the hands of the peasants, but they had to pay annual payment of land revenue. During the first fifteen years of the rule of the Crown, about a half of all revenue was raised from the land. Further, Indian government had to pay the expenditure on the British army based in India, which included pensions of army officers, expenditures on the office of the secretary of the state, or the payments to the

Bank of England. At the end of the 19th century, annual balance of trade with India was around £25 million. (Arnold, pp. 244-247).

Furthermore, the increasing interconnection of British and Indian economies, from which the British were who profited, had led to the change in technologies and communications. In 1870, Calcutta and London were connected by the telegraph. The notable change came with the railway. In 1853 started the construction of the railway system and by 1910, India had already the fourth largest railway system in the world. Unfortunately for Indians, they gained no money, the railway cost Indians £50 million, or experience in the engineering, because more than 90% of the superior posts in the railways were held by the British (Arnold p.248). The benefit of railroad network was in connecting of village based heartland and the important British imperial port cities as Bombay, or Calcutta. It accelerated the pace of extraction of raw materials from India and speeded up the transition from securing livelihood production agricultural production to commercial agricultural production. The tradition Indian handicraft industries were brought to the brink of destruction, as the local craftsmen could not compete with cheap and fast delivered products from the other parts of the British empire (Britannica, 2017)

As the number of British locomotives was increasing together with spreading railroad network, coal has started to be needed. In Behar, rich coalfield started to be mined. The production of coal jumped from around 500,000 tons in 1868 to over 20,000,000 tons by 1920. With coal industry is connected one of the greatest Indian companies, the Tata Iron and Steel Company started to production in 1911, when it launched India's modern steel industry. Tata concern continued to grow and after World War II, it became the largest steel complex in the British Commonwealth. While Bombay was known for its cotton industry, in Bengal started to grow the jute textile industry. In 1863 there were only two jute mills, but in 1882 already, there were 20 jute mills with more than 20,000 employees. The tea, indigo, and coffee were the most important plantation industries of that period. British tea production started in the 1850s in northern India, in southern India around 20 years later. By 1871 India had already over 300 tea plantations, covering more than 12,000 cultivated hectares and producing around 3,000 tons of tea. Further, by 1900 tea crop was so large, that 68,500 tons of tea could be exported to Britain, and replace tea from China in London. Besides jute textile industry in Bengal and coal and steel industry in Bihar, both areas were connected to the indigo industry. Indigo from India was exported

to European markets until the end of the 19th century when this natural dye was replaced by the synthetic ones. Coffee plantations prospered between 1860 and 1879 in southern India, after that, they were decimated by the blight and followed by the decade of decline (Britannica, 2017).

During the British Raj, India experienced several devastating famines. In 1770 the Bengal famine, which caused the death of nearly 10 million of the population of Bengal area, was the first famine British encountered. In the following years, famines had been appearing on regular basis, and caused deaths of tens millions of people between 1770 and 1944 and affected many more. The reasons for the more than a half-century of famines was various. The repeated and sustained food scarcity was caused by the poor monsoons on one hand, but also by the rigidity of the British government, when the food was rather sent by the railways to the distant markets instead of being provided to needed, on the other hand. (Arnold, p.251)

3.4.4 Modern India

As Arnold (2010) pointed out, the first half of the 20th century in India was dominated by two major endeavours. First were attempts to get out of the British supremacy, and second was political mission to fulfil the destiny of Indian nation. In years 1920 and 1922, the Non-Cooperation Movement under the leadership of Mahatma Gandhi and the Indian National Congress had appeared, besides as a reaction to Jallianwala Bagh Massacre (British troops fired on a large crowd of unarmed Indians during the religious festival in Amritsar in the Punjab region of India, killing several hundred people and wounding many hundreds more.) Its aim was to call for the nation's co-operation from the British Government, and thus break up the administrative set up of the country. This movement was actually a remarkable success as it gained the massive support of millions of Indians. This movement almost shook the British authorities. However, the Non-cooperation movement failed, and British Government sent so-called Simon Commission to India in 1927 to suggest further reforms in the structure of Indian Government. But the Commission did not include any Indian member, which led to another wave of protests all over the country and the Congress, as well as the Muslim League, gave a call to boycott the Commission.

Later, Mahatma Gandhi led the *Civil Disobedience Movement* that was launched during the Congress Session in 1929. The aim of this movement was a complete disobedience of the orders of the British Government. During this movement, it was decided that India would celebrate 26th January as Independence Day all over the country. The British Government although tried to repress the movement, which resorted to killing hundreds of people, and thousands were arrested. But it was too late, and the movement spread to all corners of the country. As consequence, roundtable conferences were arranged to calm down the situation, but without success and the Civil Disobedience Movement was revived.

In August 1942, Gandhi started yet another movement, the *Quit India* movement and decided to promote a mass civil disobedience called *Do or Die* to force the British to leave India. As a result, the movement was followed by violence directed at symbols and institutions of British colonial rule such as railway stations, telegraph offices, and government buildings. The government held Gandhi responsible for these acts of violence, suggesting that they were a deliberate act of Congress policy. Leaders of the Congress were arrested, the Congress was banned, and the police and army were brought out to suppress the movement. Although, two leaders of the movement, Netaji Subhash Chandra Bose, were able to escape abroad, where they started to organize the Indian National Army (INA) with one aim, to overthrow the British from India.

When the World War II started in 1939, without any discussion with Indian leaders, India was forced to participate in the war on behalf of the British. After the war, Labour Party with prime minister Clement Richard Atlee became the leading party in Britain. Labour party was known for their fondness for Indian freedom and overall end of imperialism. In March 1946, another mission was sent to India to investigate possibilities for creation of interim government and Constituent Assembly, which would be capable of adapting a constitution acceptable by the British. The interim government was eventually formed with Jawaharlal Nehru as its leader. Nevertheless, the Muslim League refused to accept the way of how new Indian state and government should be assembled and started to demand for independent state of Pakistan, which escalated into bloody violence between Muslims and Hindus, and eventually Indian leaders were left no choice but accept the partition.

After all troubles, India gained its freedom on August 14, 1947. Since then, India celebrates its Independence Day on August 15. Jawaharlal Nehru became thus the First Prime Minister of independent India and stayed in his office until 1964 (KnowIndia, 2017; Arnold, 2010).

3.4.5 Current political situation

Republic of India (English), or *Bhartiya Ganarajya* (Hindi) is Socialist Secular Democratic Republic with a parliamentary system of government. Federation comprises of 29 states and 7 union territories⁵. The Republic is governed in terms of the Constitution of India which was adopted by the Constituent Assembly on 26th November 1949 and came into force on 26th January 1950.

According to the Constitution of India, the head of the Executive of the Union is the President. As per Article 79, the council of the Parliament of the Union consists of the President and two Houses known as the Council of States (*Rajya Sabha* – up to 250 members) and the House of the People (*Lok Sabha* – up to 552 members). Article 74(1) of the Constitution provides that there shall be a Council of Ministers with the Prime Minister as its head to aid and advise the President. The real executive power is thus vested in the Council of Ministers with the Prime Minister as its head (National Portal of India, 2017).

Elections in such enormous and complex country are difficult affairs. In the last general elections to the *Lok Sabha* that were held in May 2014, 814 million people were eligible to vote. The election lasted over six weeks, but all votes were counted on a single day. The election in 2014 also broke the record, when 66% of those eligible voted.

Regarding judicial branch, The Supreme Court is the highest judicial authority in civil, criminal and constitutional cases. If a judge wants to be appointed to the Supreme Court, he must be recommended by the collegium – the four most senior judges of the court and then appointed by the President. The subordinate courts are High Courts, District Courts, and Labour Courts (Roger Darlington, 2017).

⁵ Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Chhattisgarh, Dadra and Nagar Haveli, Daman and Diu, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Lakshadweep, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, West Bengal

Political parties in India are either a National Party or a State Party. If a political party wants to be considered a National Party, it must be recognised in at least four states and must be ruling in those states or be in opposition. The oldest political party in India is India Congress Party, formed as Indian National Congress (INC) in 1885. Since its foundation, INC has been a dominant political party in India. First decades until 1947, the focus was on agitation against British supremacy and request of independence. Since 1947, when India really gained its independence, Congress Party required to be the governing party, and for most of the time of the country independence, Lokh Saba (House of People) has been controlled by the ICP. With some short periods out of power (1977-1980, 1989-1991, 1996-2004), the ICP has been ruling the country.

The leadership of ICP has been for an extended period of time dominated by a family of Jawaharlal Nehru, first prime minister of independent India who served for 17 years. His daughter Indira Gandhi became prime minister, and his grandson Rajiv Gandhi was also prime minister of India. Children of late Rajiv Gandhi are politically active as well; his son Rahul Gandhi is a member of parliament and his daughter Priyanka as a political campaigner. The Indian Congress Party nowadays leads the United Progressive Alliance (UPA), a coalition of centre-left parties, which comprises of a total of sixteen parties.

In elections in 2014, ICP lost to another major political party BJP (Bharatiya Janata Party). BJP party scored biggest election victory by any party in 30 years, and with 282 seats, it won a parliamentary majority by itself. BJP was established in 1980 and represents itself as a champion of the socio-religious cultural values of Hindu majority and advocated conservative social policies and strong national defence. The leader of BJP and current prime minister of India is Narendra Modi.

The BJP is a leading party of a right-wing political coalition called the National Democratic Alliance (NDA). Currently, there are eight parties in the NDA coalition. (Roger Darlington, 2017; BBC, 2017)

3.5 India in Context of Economic Groups

India is a member of numerous economic groups and organizations, which have an impact on the development of its economy. Of most important and influential international organizations can be mentioned G20 countries, World Trade Organization (WTO), or Commonwealth of Nations.

3.5.1 BRICS

Acronym BRICS stands for Brazil, Russia, India, China, and South Africa. It is the association of emerging national economies, that together share a major share of the world's production and population. First, the acronym was used in 2001 by an economist of Goldman Sachs, Jim O'Neill. First, it was referred as BRIC, later in 2011, South Africa was included. All BRICS countries are also G20 countries.

First Summit was held in Yekaterinburg in 2009, after that, five more annual summits were held. In this period BRICS has developed a consensus amongst its members in areas of (i) coordination in multilateral fora, with focus on economic and political governance; and (ii) cooperation between members (BRICS, 2017).

Principal areas and topics of BRICS are Finance and Central Banks, Trade, Business Forum and Council, Financial Forum, Academic Forum and Think Tanks Council, Health, Science and Technology, Security, Agriculture, and Statistics. BRICS Finance Ministers meet regularly at the margins of the G20 meetings and of the biannual IMF and World Bank meetings. In case of trade, the Trade Ministers of BRICS meet on the eve of Summits. Institutional framework and concrete measures to expand cooperation in trade area are proposed by the Contact Group for Economic and Trade Issues, which reports to the ministers.

BRICS business council was established in 2013 with a purpose to make recommendations on the issue of trade and investment related to the business environment. This council consists of five CEOs of five companies of each country. Since 2010, presidents of national development banks of BRICS countries have met during the

Summits and have already signed eight agreements on financial cooperation. For Agriculture, the Action Plan 2012 – 2016 was approved in 2010 in Chengdu, providing guidance to the cooperation in the field. A Working Group of Agricultural Experts was established (BRICS, 2017).

3.5.2 SAARC

South Asian Association for Regional Cooperation (SAARC) comprises of eight Member states from the South Asian Region: Afghanistan, Bangladesh, Bhutan, India, Maldives, Pakistan, Sri Lanka and was established in 1985. Since 1987 the Secretariat of the Association has been set up in Kathmandu, Nepal.

Among others, the main objectives of the SAARC are: to promote the welfare and improve quality of life of people in South Asia; to accelerate economic growth, social progress and cultural development and to provide all individuals the opportunity to live in dignity; to promote active collaboration and mutual assistance in the economic, social, cultural, technical and scientific fields; or to cooperate with international or regional organizations with similar aims.

In the field of economic and financial cooperation of SAARC, an important Agreement on South Asian Free Trade Area (SAFTA) was signed by the foreign ministers of SAARC member countries. The SAFTA was reached in 2004 and came into force in 2006 with the promise of reduction of customs duties (Tariffs, Non-Tariff Measures, and Para-Tariffs) of all traded goods to zero by 2016 (SAARC, 2017).

By the definition of World Bank, Non-Tariff Measures include any measure, regulation, or practice, other than tariffs and para-tariffs. Para-Tariffs mean border charges and fees, other than tariffs.

The key instrument was Trade Liberalisation Programme. According to this programme, the contracting countries must follow the schedule of the tariff reduction. For the Non-Least Developed Contracting countries, there should be a fall by 20% within a time frame of 2 years, from the date of coming into force of the Agreement. For the Least

Developed⁶ countries, there should be a fall by 30% within the frame of 2 years. The subsequent tariff reduction from 20% to below 0-5% for Non-Least Developed countries should be done in the second-time frame of 5 years, and from 30% to below 0-5% for the Least Developed countries should be done in the second-time frame of 8 years. (World Bank, 2017)

3.5.3 AIFTA

ASEAN – India Free Trade Area (AIFTA) is yet another area of free trade in the Asian region between India and member states⁷ of ASEAN (Association of Southeast Asian Nations). The initial framework agreement was signed in 2003, the ASEAN-India Trade in Goods Agreement was signed in 2009 and ASEAN-India Trade-in-Services and Investments in 2015. With the signing of these two agreements, the AIFTA was finalised.

AIFTA covers approximately ninety percent of the tariff lines trade between ASEAN and India. Among other benefits, AIFTA allows back-to-back shipments of goods within member countries, and for third-party invoicing of goods. For tariff reduction, thirty-five percent of the product must originate from the ASEAN-India region.

Between years 2000 and 2016, FDI inflows into India from ASEAN countries were 54.97 billion USD, which represents 16.8% of the cumulative inflows received by India, and cumulative FDI outflows from India to ASEAN countries in the period 2007-2015 were about 38.6 billion US (Iesingapore, 2017; ASEAN, 2017).

3.5.4 BIMSTEC

Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising seven Member States; Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand located in the areas of the Bay of Bengal. BIMSTEC came into being in 1997 and represents reinforcement of relations among its members.

⁶ Least Developed Countries (LDCs) are defined by the UN as low-income, confronting severe structural impediments to sustainable development. They are highly vulnerable to economic and environmental shocks and have low levels of human assets.

⁷ Member states of ASEAN – Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

The main objective is to accelerate growth through cooperation in different sectors by utilizing regional resources and mitigating of globalization in the area. BIMSTEC is, therefore, a sector-driven cooperation group. It focuses on many sectors including trade, technology, energy, transport, tourism, fisheries, agriculture, poverty alleviation, environment or climate change etc. Each member state is responsible for coordination of specific sectors, India is thus responsible for coordination of Transportation and Communication, Tourism, Environment and Disaster Management, and Counter-Terrorism and Transitional Crime.

In 2005 the Asian Development Bank (ADB) has become a development partner for BIMSTEC to promote and improve transport infrastructure and logistics among member countries. The ADB has created and already communicated to all members the project called BIMSTEC Transport Infrastructure and Logistic Study. (BIMSTEC, 2017)

3.5.5 India and OECD

Although India is not a member of Organization for Economic Co-Operation and Development, India and OECD retain working relations, when they have been co-operating since 1995. Also, in 2007, the OECD Council at Ministerial level adopted a resolution to strengthen co-operation with India, Brazil, Indonesia, China and South Africa, these strengthening processes have the potential to lead to future membership of these countries.

India benefits especially from the opportunity to discuss main policy issues and to learn from the experiences of the OECD countries with a similar background. On the other hand, OECD countries benefit through increased engagement in trade and investments.

India participates in OECD general activities such as Board of the OECD's Development Centre, participates as an observer in several OECD Committees and working groups. India also supports the regional activities of OECD in Asia by hosting regional forums and workshops on issues of investment, taxation, or development (OECD, 2017).

4 Practical Part

This chapter is focused on evaluating of Indian economic growth. Firstly, the main macroeconomic indicators are analysed in the period from 1995 to 2016, and trend analysis is used for prediction of future values. Secondly, three main sectors of the economy are analysed with emphasis on main import and export commodities for each sector. Further, this chapter focuses on factors influencing economic growth such as demographics, transport infrastructure, education, market size, labour cost and others. Furthermore, the statistical analysis with an econometric model of Indian economic growth is described in this chapter.

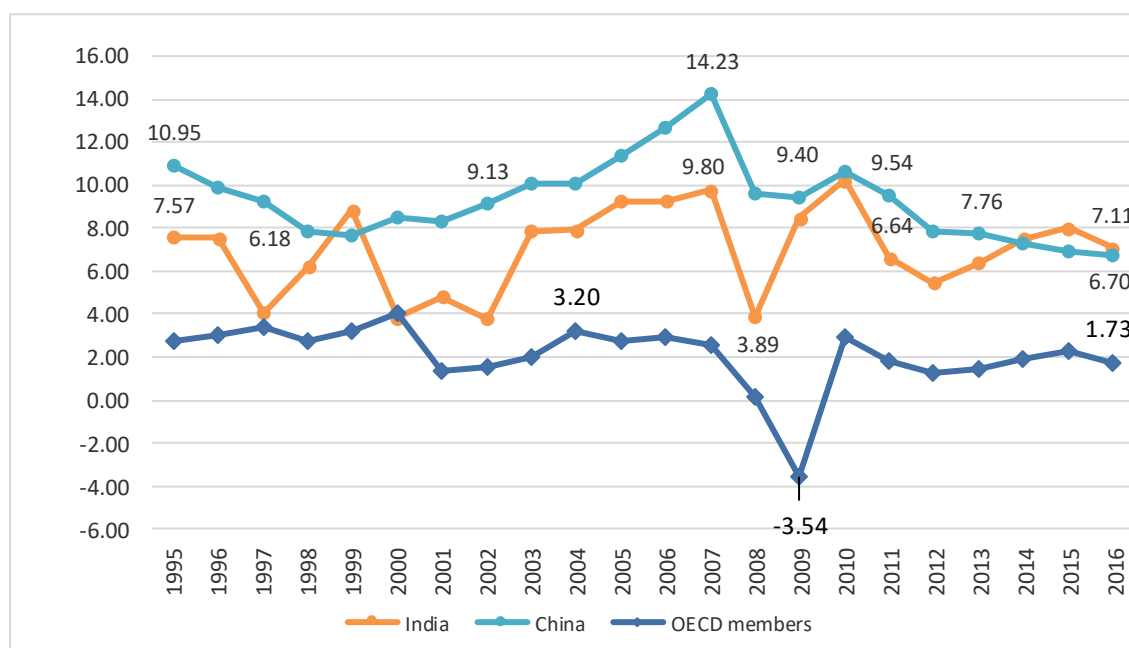
4.1 Trend Analysis of Indian Macroeconomic Indicators

India is one of the fastest growing economies in the world and one of the most important powers in the region along with China. For evaluation of economic growth, GDP development and other macroeconomic indicators such as inflation rate, unemployment rate, exchange rate, and balance of payments, are used. These macroeconomic indicators are analysed in the period from 1995 to 2016. Moreover, the trend analysis of abovementioned indicators is used for prediction of their future values.

4.1.1 GDP Growth

When India gained its independence from Britain in 1947, the centrally-planned, mixed economy was created. In the beginning, India focused on heavy industry, which turned out to be unsustainable. Therefore, in 1991, India started to loosen economic restrictions through liberalization and privatization policies and opened the economy to the international trade. Since then, its economy started to grow exponentially (Investopedia, 2016). According to OECD (2017), India is the fastest-growing G20 economy with an annual growth rate over 7%. The growth was supported by the faster structural reforms, move towards a rule-based policy framework and low commodity prices.

Figure 4: GDP Annual Growth Rate 1995-2016 [%]



(Source: Data provided by World Bank, 2017)

In 2014, India has surpassed China, another major fast-growing economy, for the first time since 1999, and since then retains its higher economic growth (Figure 4). As data provided by World Bank shows, in 2016 India was a 7th largest economy in terms of nominal GDP and third largest in terms of GDP in PPP (World Bank, 2017). Furthermore, GDP expressed in PPP (purchasing power parity) can be seen as a preferable method for an explanation of how large the economy of the country is, whereas purchasing power parity eliminates the differences in price levels between countries.

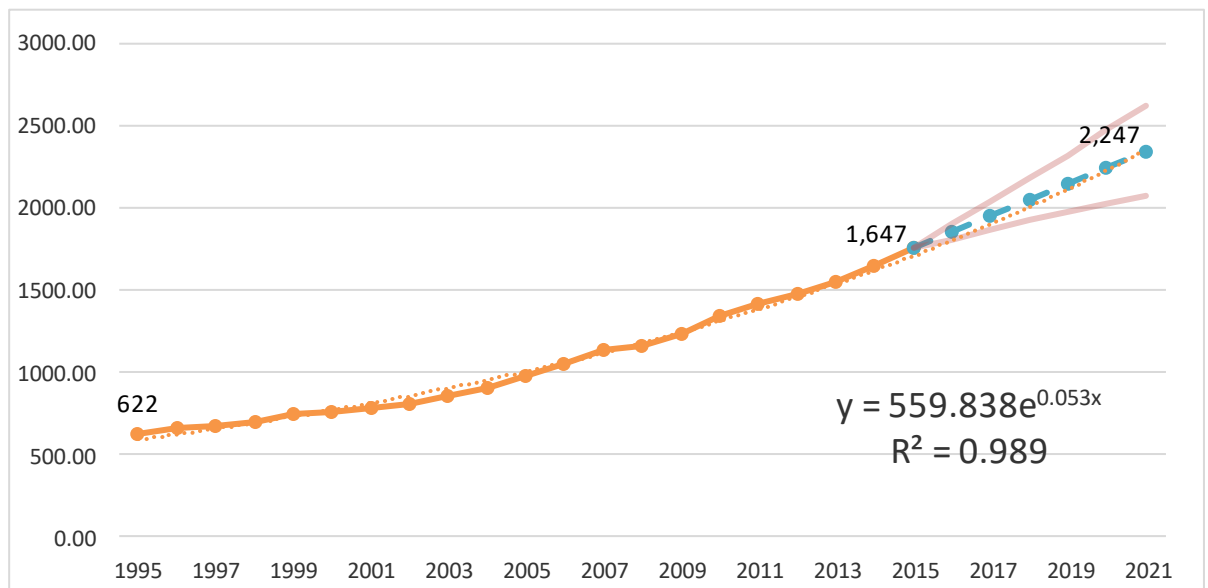
Nevertheless, the development of India’s GDP growth rate displays fluctuations during the period from 1995 to 2016. The fluctuations range from 3.8% in the year 2002 to 10.26% in 2010. The GDP growth rate decrease between 1996 – 1997 from 7.55% to 4.05% emerged as a reaction to turbulent and unfavourable international economic environment such as the East Asian crisis, unusual volatility in capital and forex markets of industrial countries, or low capital flows to developing countries. In addition, in 1996 were introduced reform initiatives in critical infrastructure subsectors, furthermore, new policy measures such as industrial de-licensing, trade policy, or foreign investment were introduced as well. After the following two years of steady growth, India experienced a

steep fall from 8.85 % in 1999 to 3.84% in the year 2000. This was caused mainly by the extension of East Asian crisis to countries in other continents, sharp devaluation in Brazil in 1999. World trade growth decelerated sharply as well at that time, commodity prices fell, and deflation affected the global economy, thus also India. The GDP growth rate decreased from 4.82% in 2001 to 3.80% in 2002. Afterwards, GDP growth rate experienced a steady growth between 2002 and 2007. Additionally, India experienced 3 consecutive years of GDP growth rate more than 9%, specifically 9.28 % in 2005, 9.26% in 2006, and 9.80% in 2007 (Figure 4). (Indian Ministry of Finance, 2017)

In 2008, Indian economy, same as the majority of the world, was hit by the financial crisis, following the collapse of investment bank Lehman Brothers in the United States. The GDP growth rate, therefore, declined to 3.89%. In following years, however, Indian economy was able to get back on the track of GDP growth due to high capital inflows attributed to the Quantitative Easing (QE) undertaken by the USA to fight the economic slowdown. GDP growth rate improved up to 10.26% in 2010. Another growth slump appeared between 2010 and 2011, when growth rate decreased to 6.64%, mainly due to domestic policy logjam, tax disputes and shaken investor confidence in Indian economy with attendant lower Gross Domestic Savings Rate (GDSR) and Gross Fixed Capital Formation (GFCF) (Figure 4). (Indian Ministry of Finance, 2017)

Since 2012, the Indian economy has been growing again. Since 2014, the structural reforms have brought a new growth stimulus. As the OECD (2017) points out, the predictability of macroeconomic policy and its outcomes have been improved by the reaffirmation of fiscal rules and the application of inflation targeting, clearer rules for auctioning of oil, gas and coal mines, or the simplification of administrative requirements to scrap the out-dated laws. The rules for foreign direct investments (FDI) have been also changed, reducing the share of FDI inflows requiring the approval from the government.

Figure 5: Trend Analysis of GDP per capita [constant 2010 USD]



(Source: Data provided by World Bank, 2017)

GDP per capita (expressed in constant 2010 US Dollars) rose by 67% between 1995 and 2016 from \$622 to \$1,861, compared to 24% upsurge for OECD countries in the same period. Although the gross domestic product has been increasing year by year, in 2016, it stood only at 5% of the OECD average (Appendix).

The exponential trend line fits best for the estimation of future growth of GDP per capita. In case of the exponential trend, the measured values are increasing or decreasing at a more rapid rate, compared to steady linear trend. The calculation is based on data from Table 24 (Appendix). Additionally, the coefficient of determination R^2 is used to provide information about the goodness of fit of the model. Values of R^2 range from 0 to 1. If the R^2 value equals 1, it means the regression line fits perfectly the data, and vice versa.

The figure 5 displays the equation $y = 5559.838e^{0.053x}$ and a R^2 value of 0.989. This high value indicates that about 99 percent of the variability of GDP per capita values can be explained by this model and the deviation of the real data can be only about 0.1 percent. From the model can be seen an obvious rising trend. It indicates a stable economic growth, which should continue in following years between 2017 with estimated GDP per capita value of 1,954 USD, and 2021 with estimated GDP per capita value of 2,345 USD (Table 2).

Table 2: Estimated Future Values of GDP per Capita [constant 2010 USD]

Year	2017	2018	2019	2020	2021
GDP	1,954	2,051	2,149	2,247	2,345

(Source: Own calculation)

The growth will be upheld by the continuation of the contemporary structural reforms. Agriculture will continue to provide the momentum to the economy, but industry should increasingly take over as a growth driver. Private consumption will remain a stable source of growth and private investment should eventually accelerate (World Bank, 2017). The potential game-changer, that could speed-up the growth is the implementation of the Goods and Services Tax (GST). GST should help to make India a common market and to promote investment, productivity and competitiveness. (OECD, 2017).

The Goods and Services Tax was launched on 1 July 2017 after 13 years of preparations. GST replaces former indirect taxes and levies that were usually different for each state and brings the unity to the taxation system with the principle “one good, one tax”. The model introduced in India is unique and reflects the federal structure of the country. GST model comprises two main components. First, the Central GST (C-GST) is imposed and collected by the central government, and the second component State GST (S-GST) is collected and appropriated by each state of the India. For the interstate transaction within India will be then set an integrated GST (I-GST) at a rate equal to C-GST and S-GST. Furthermore, Indian GST system is specified by the number of rates, from exempt, low-rated, to standard-rated with additional cesses (Table 3). The multiplicity of rates is given by the variety of objectives such as the need to retain rates down for a number of essential goods to protect poorer sections from price rises. (World Bank, 2017; Government of India, 2017).

As key benefits of GST system, Indian Ministry of Finance (2017) states primarily: furthering cooperative federalism, reducing corruption and leakage, simplifying tax structure, creating a common market, eliminating bias in favour of imports, reducing consumer tax burden, and boosting revenues and investment leading to medium-term economic growth.

Table 3: GST Rates and Exclusions from GST Base

IGST (%)			Number of Goods Categories	Major Goods (Sectors) Excluded
CGST (%)	SGST (%)	Total (%)		
0	0	0	88	Alcohol
1.5	1.5	3	Gold and jewellery	Petroleum and energy
2.5	2.5	5	173	Electricity
6	6	12	200	Land and real estate
9	9	18	521	Education
14	14	28	229	Healthcare

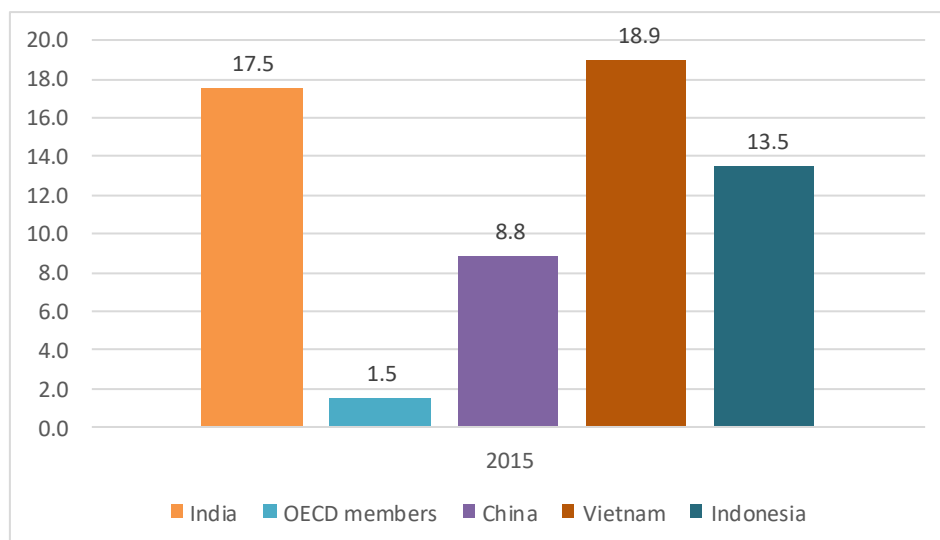
(Source: Data provided by the Government of India, 2017)

Although the GST, is a huge step forward to improve the economic performance of India, there are also challenges lying ahead. Room for improvement finds itself especially in goods (sectors) excluded from the GST. Alcohol, petroleum and energy products, electricity and some of the land and real estate transactions are outside the GST base but are taxed by the Centre and states outside the GST. Moreover, healthcare and education are exempted under the GST at all, thus are not taxed by Centre and states. Including of alcohol and real estate into the GST would improve transparency and reduce corruption, furthermore, the inclusion of electricity into the GST would improve the competitiveness of Indian industry, whereas taxes on power are embedded in producer's costs, and can be claimed back as input tax credit (Government of India, 2017).

But on the other hand, economic performance could be also distorted by external factors. OECD (2017) mentions financial turbulences and geopolitical risks. Geopolitical risks could be caused by the increasing tensions with neighbouring countries. It would affect consumer and business confidence and create pressure, especially on military spending. Because highly leveraged companies and public banks with large loans are vulnerable to major shocks coming from domestic and foreign financial markets, the investment would suffer and need of recapitalisation would, which would have a negative impact on economic growth.

Share of Agriculture in GDP

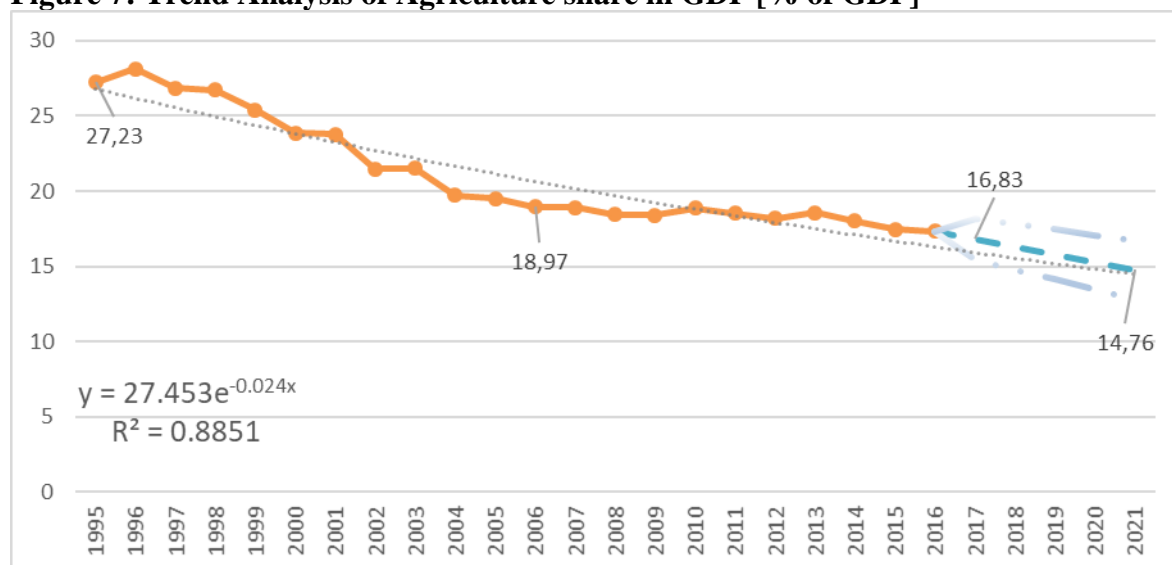
Figure 6: Share of Agriculture in GDP in Selected Countries [% of GDP]



(Source: Data provided by World Bank, 2017)

Figure 6 displays comparison of agriculture GDP share in selected developing and developed countries in the year 2015. Relatively high share of agricultural production in GDP for India (17.5%), Indonesia (13.5%), Vietnam (18.9%), but also China (8.8%) confirms that these countries still belongs among developing countries, compared to developed countries represented in Figure 6 by OECD member states with average share of agriculture in GDP from 1.5%. In contrary, the share of agriculture in India's GDP has been continuously declining since 1995. While in 1995, agriculture contributed to the GDP from about 27%, in 2016 it was already from about 17% (Figure 7), which represents 36% drop in the monitored period between 1995 and 2016. But in terms of real currency, contribution to the GDP rose from about 180 billion USD (constant 2010 USD) to about 344 billion USD (constant 2010 USD), which represents 47% increase between 1995 and 2016 (Table 24, Appendix). It means, while the share of agriculture in GDP has been declining since 1995, the real added value has been increasing.

Figure 7: Trend Analysis of Agriculture share in GDP [% of GDP]



(Source: Data provided by World Bank 2017)

The trend analysis of agriculture share in GDP displays the equation $y = 27.453e^{-0.024x}$ with a coefficient of determination (R^2) equal to 0.8851 (Figure 7). This means that development of agriculture share in GDP can be explained by about 88% by exponential trend line. Although the R^2 is high, the forecast of future values is based on the method of exponential smoothing. Figure 7 also displays the forecast of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of a share of agriculture in GDP for the year 2021 will be with 95% probability between 12.83% and 16.69%. All estimated values for years 2017 – 2021 are shown in Table 4. From the trend line depicted in Figure 7 is apparent, that the real future values of Agriculture share in GDP should be closer to the lower confidence level and the prognosis, rather than to upper confidence level.

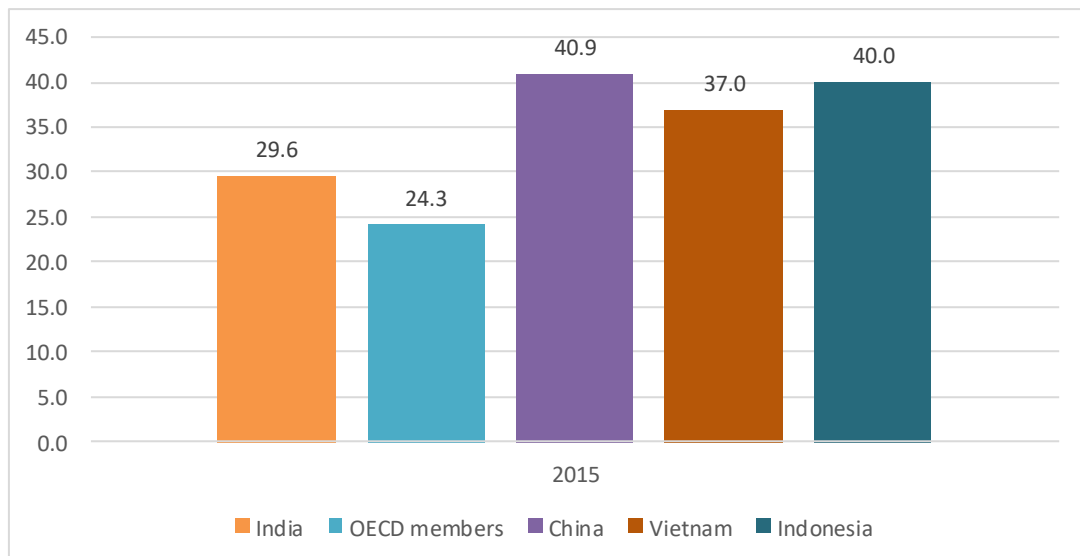
Table 4: Estimated Future Share of Agriculture in GDP [% of GDP]

Year	2017	2018	2019	2020	2021
LCL	15.47	14.79	14.13	13.47	12.83
Prognosis	16.83	16.31	15.80	15.28	14.75
UCL	18.20	17.84	17.47	17.08	16.69

(Source: Own calculation)

Share of Industry in GDP

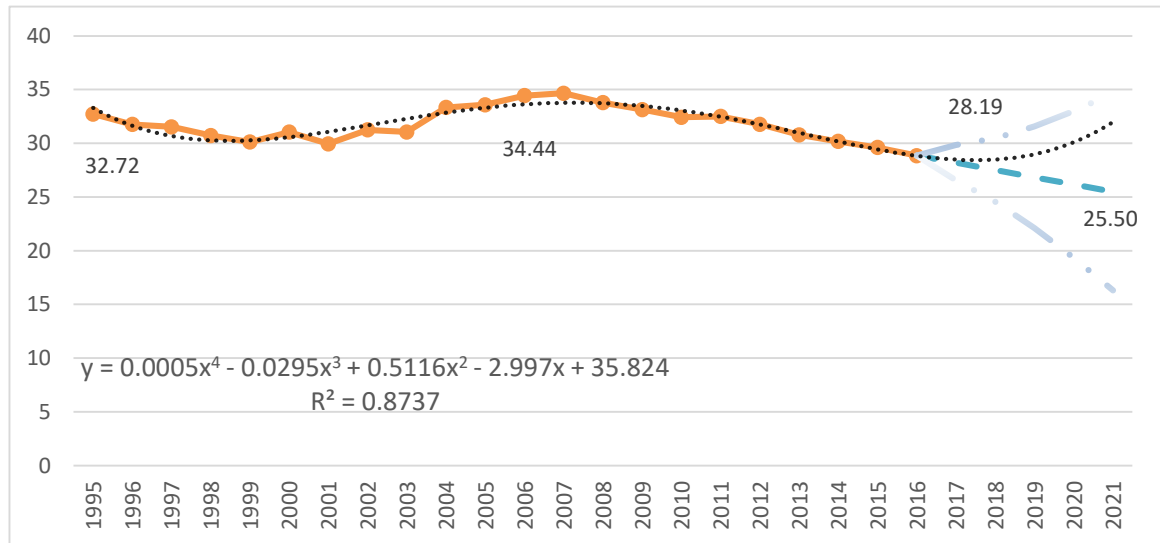
Figure 8: Share of Industry in GDP in Selected Countries [% of GDP]



(Source: Data provided by World Bank, 2017)

Figure 8 displays comparison of shares of an industry in GDP in selected developing and developed countries in the year 2015. India's share of industrial production (29.6%) is approaching that of developed countries represented in figure 8 by the OECD member states (24.3%). The share of industry in GDP is even about 11% lower than in China (40.9%) and also Indonesia (40%). Vietnam with a share of industry in GDP equal to 37% is quite high compared to India. The share of industry in India's GDP has had decreasing tendency since 1995 but with moderate fluctuations between years 2001 and 2007 (Figure 9). The lowest share of industry in GDP was in 2016 with 28.9%, while the highest rate was in 2007 with about 34.7% of GDP. Considered the real currency, contribution to the GDP rose from about 170 billion USD (constant 2010 USD) in 1995 to about 710 billion USD (constant 2010 USD) in 2016, which represents 75% increase during the monitored period. It means, while the share of industry in GDP has slightly fluctuating since 1995, the real added value has been increasing (Appendix).

Figure 9: Trend Analysis of Industry share in GDP [% of GDP]



(Source: Data provided by World Bank, 2017)

Because of the slight fluctuations during the monitored period, as the best fitting trend function appears to be polynomial trend function of the fourth degree. Trend analysis of industry share in GDP thus displays the equation $y = 0.0005x^4 - 0.0295x^3 + 0.5116x^2 - 2.997x + 35.824$ and coefficient of determination (R^2) equal to 0.8737 (Figure 9). This means that development of industry share in GDP can be explained by about 87% by polynomial trend line. Although the R^2 is high, the forecast of future values is based on the method of exponential smoothing. Figure 9 also displays the forecast of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of a share of industry in GDP for the year 2021 will be with 95% probability between 16.31% and 34.68%. The estimated value is therefore 25.5% for the year 2021, all other estimated values for years 2017 – 2021 are shown in Table 5. The relatively high span between estimated lower and upper confidence level is given by the polynomial trend of the dataset. Depending on the degree of polynomial function, the share of industrial production in GDP could go up as depicted in Figure 9, but also down. But if no unpredicted situation will appear, it is likely that share of the industry will be decreasing moderately as show the prognosis numbers from Table 5.

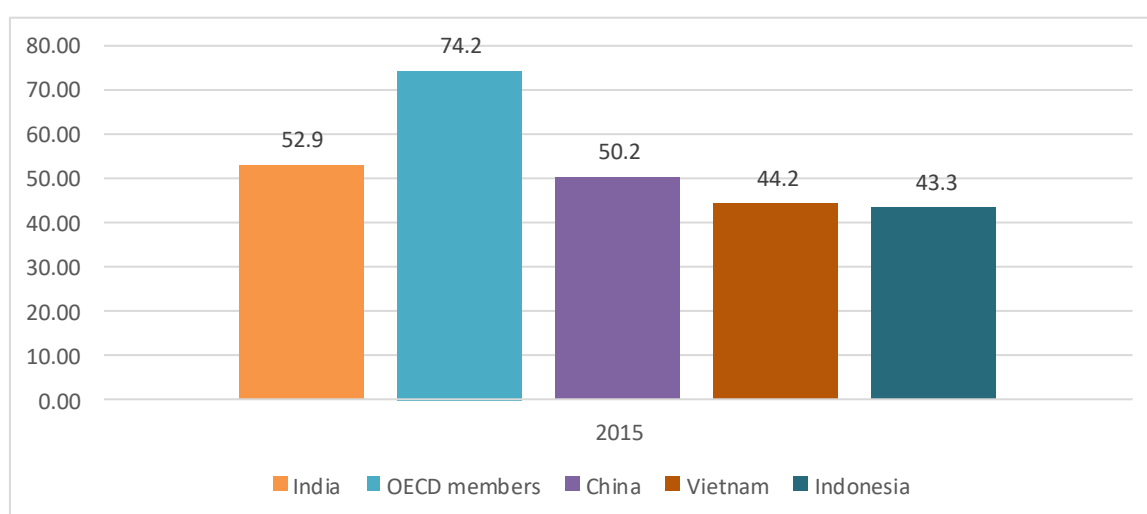
Table 5: Estimated Future Share of Industry in GDP [% of GDP]

Year	2017	2018	2019	2020	2021
<i>LCL</i>	26.55	24.56	22.12	19.35	16.31
Prognosis	28.19	27.52	26.84	26.17	25.50
<i>UCL</i>	29.84	30.48	31.57	32.99	34.68

(Source: Own calculation)

Share of Services in GDP

Figure 10: Share of Services in GDP in Selected Countries [% of GDP]

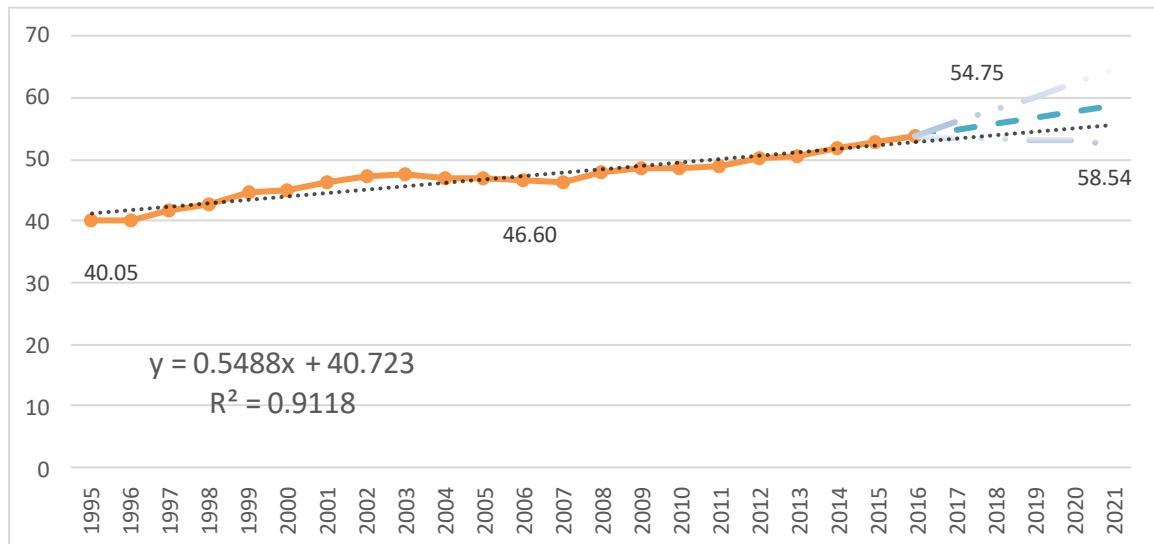


(Source: Data provided by World Bank, 2017)

Comparison of countries according to share of services in GDP in the year 2015 is displayed in Figure 10. Developed countries have usually share of services 70% and more which is confirmed by 74.2% share of services in GDP for OECD member countries. India shows still room for growth in the service sector with 52.9% share of GDP in 2015. Similar share possesses China with 50.2%, Vietnam (44.2%) and Indonesia (43.3%) did not even reach the level of 50% of GDP contributed by services. In contrary, the share of services in India's GDP has been continuously increasing since 1995. As the share of industry in the economy has been declining very moderately, the growth of the services has been allowed mostly at the expense of agriculture. While in 1995, services contributed to the GDP from about 40%, in 2016 it was already from about 54% (Figure 8), which represents 24% growth in the monitored period between 1995 and 2016. If the absolute values are taken

into account, services contribution to the GDP rose from about 183 billion USD (constant 2010 USD) to about 1,206 billion USD (constant 2010 USD), which represents enormous 87% increase between 1995 and 2016, the most from all sectors of the economy. (Appendix).

Figure 11: Trend Analysis of Services share in GDP [% of GDP]



(Source: Data provided by World Bank, 2017)

The contribution of the service sector to the GDP is best explained by the linear trend. Figure 11 displays the equation $y = 0.5488x + 40.723$ with coefficient of determination (R^2) equal to 0.9118. This means that development of services share in GDP can be explained by about 91% by linear trend line. Although the R^2 is over 0.9, the forecast of future values is based on the method of exponential smoothing. Figure 11 also displays the forecast of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of a share of services in GDP for the year 2021 will be with 95% probability between 52.96% and 64.53%. The estimated value for the year 2021 is thus 58.54 %, all estimated values for years 2017 – 2021 are shown in Table 6.

Table 6: Estimated Future Share of Services in GDP [% of GDP]

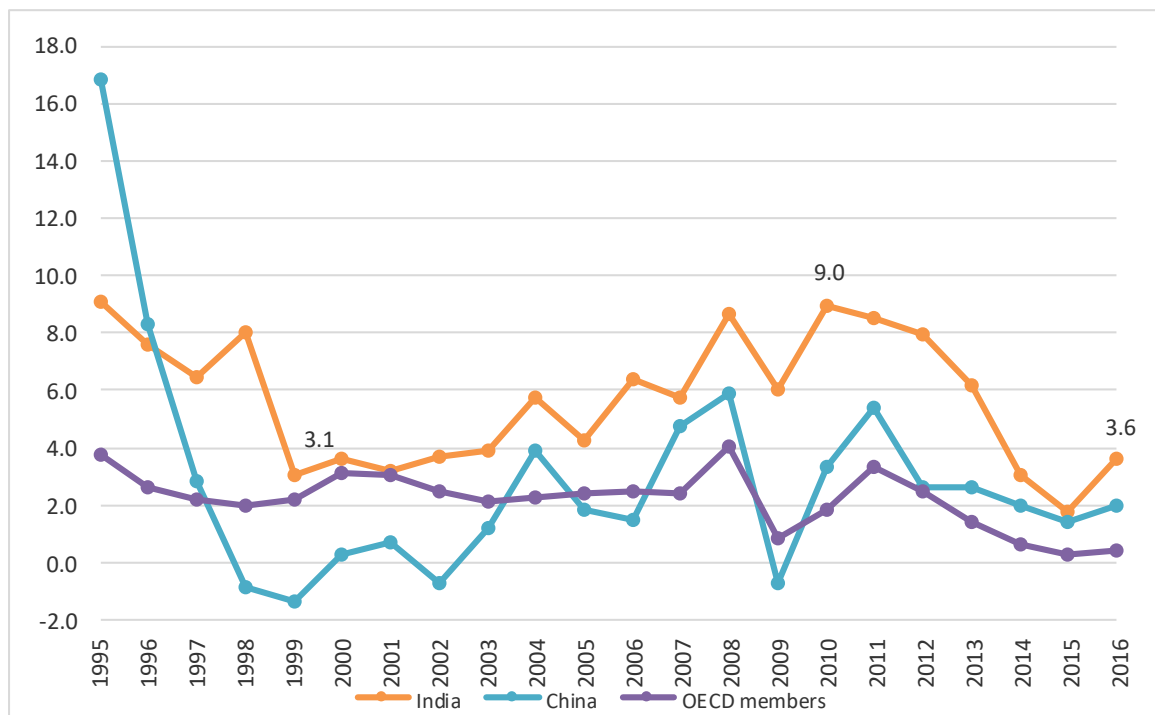
Year	2017	2018	2019	2020	2021
<i>LCL</i>	53.49	53.42	53.25	52.96	52.96
Prognosis	54.75	55.70	56.65	57.60	58.54
<i>UCL</i>	56.02	57.98	60.05	62.23	64.53

(Source: Own calculation)

4.1.2 Inflation

Since the start liberalization of the economy in 1991, the aim of Indian government has been to sustain economic growth with a low rate of inflation. High inflation, high deflation, but also high fluctuation in the price level are generally undesirable phenomena.

Figure 12: Inflation Rate Based on Consumer Prices [annual %]



(Source: Data provided by World Bank)

From the Figure 12 is evident, that since 1995 the annual inflation rate based on consumer prices has been higher compared to OECD countries, only in 2001, India's annual growth rate approached OECD countries with 3.7% for India and 3.0% for OECD members. Since then, in terms of the inflation rate, the difference between India and OECD has started to increase again. In case of China, rapid fall in inflation had appeared between 1995 and 1998, from 16.9 % to -0.8%. Since then, China retains lower annual inflation than India, and since 2003, inflation is similar to OECD countries. When the average inflation for the period between 1995 and 2016 is considered, India shows average inflation of 7.2 % for this period, while China 2.9 % and OECD countries only 2.2 % (Appendix).

Figure 12 also demonstrates a high rate of fluctuations between 1995 and 2016. These can be caused by several reasons. Higher inflation in developing countries, like India, is caused by the growing wealth of the population, which leads to growing demand for before unavailable goods and services in the economy, which leads to higher prices. Furthermore, weather condition is related to inflation as well, historically, always when drought has appeared in India, it led to the high inflation rate. Moreover, inflation peaks in 1998 and 2010 (Figure 12) were caused in 1998, by low oil prices, but rising prices of food, and in 2010 by drought and rising commodity prices. (Government of India, 2017)

In India, inflation is one of the most closely observed economic variables as it has a considerable influence on the life of an average consumer. As Agarwal (2010) points out, while most of the developed countries use the CPI to calculate inflation, India rather uses WPI, because there are problems associated with using of CPI, although there are data available for CPI in India as well.

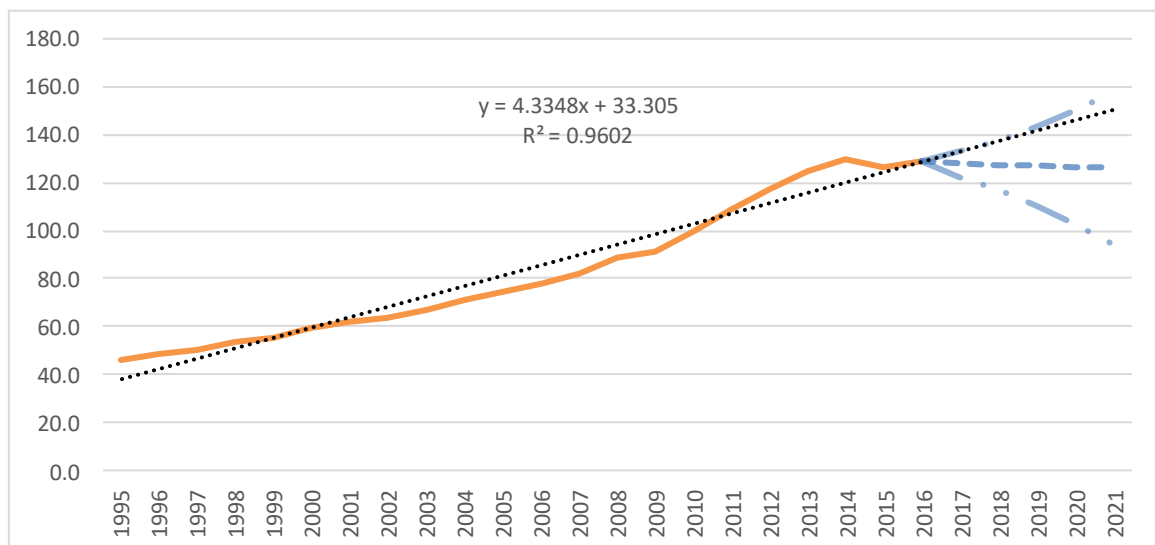
Table 7: Inflation Rate – an increase in WPI with the base year [2010=100]

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Base Index	46.3	48.4	50.6	53.6	55.4	59.1	61.9	63.5	66.9
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Base Index	71.3	74.7	78.2	82.1	89.2	91.3	100.0	108.9	117.7
Year	2013	2014	2015	2016					
Base Index	125.1	130.0	126.4	128.9					

(Source: Data provided by World Bank, 2017)

The base index is thus inflation rate counted as an increase in WPI compared to the base period (average 2010 = 100) and expresses the change in the price level between reference year and the average of 2010. The trend line is used to find the trend in the inflation measured by WPI. The linear trend line fits best to the data set from Table 7 and show the steady development of the inflation.

Figure 13: Trend Analysis of Inflation Rate [2010=100]



Source: Data provided by World Bank (2017)

The Figure 13 displays the equation $y = 4.3348x + 33.305$ with coefficient of determination (R^2) equal to 0.9602. This means that development of WPI inflation can be explained by about 96% by linear trend line. The forecast function in MS Excel 2016 is used for determination of future values. Figure 13 also displays the forecast of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of inflation rate for the year 2021 will be with a probability of 95% between 94.5 and 157.7. Although from the trend line function in Figure 4 is evident, that the real future values of inflation will be likely closer to the upper confidence level rather than to lower confidence level (Table 8).

Table 8: Estimated Future Inflation Rate [2010=100]

Year	2017	2018	2019	2020	2021
<i>LCL</i>	<i>122.3</i>	<i>117.3</i>	<i>110.8</i>	<i>103.1</i>	<i>94.5</i>
Prognosis	127.9	127.5	127.0	126.6	126.1
<i>UCL</i>	<i>133.6</i>	<i>137.7</i>	<i>143.3</i>	<i>150.1</i>	<i>157.7</i>

(Source: Own calculation)

Demonetisation

Another recent important government measure, which influenced an Indian economic development was the demonetisation from November 8, 2016. Prime Minister Narendra Modi announced that day, that current 500 INR and 1000 INR banknotes would immediately become an illegal form of currency. This was an unprecedented event, as about 23 billion banknotes have been demonetised, which represents 86% of the total value of the currency in circulation, or 10% of GDP. Although this demonetisation can be better described as a currency exchange, as the 500 INR and 1000 INR bills could be exchanged for lower-denomination notes and new 500 INR and 2000 INR banknotes (OECD, 2017; World Bank, 2017).

Demonetisation was part of the government's measures to eliminate falsified banknotes, fight corruption and "black money", and to reduce tax evasion. Another no less important objective was to promote a digital (non-cash) payments. Problems occurred, when the amount demonetised banknotes surpassed the amount of new valid banknotes distributed. Also, daily and weekly restrictions of new notes distribution came into force to keep a steady pace, but it eventually led to the long lines at cash withdrawals and people had to wait even several hours. As the effect of this situation, the value of a currency with the public reached in December 2016 only 46% of the pre-demonetisation value. Although later in April 2017, the liquidity had reached already the 80% of the pre-demonetisation levels (World Bank, 2017).

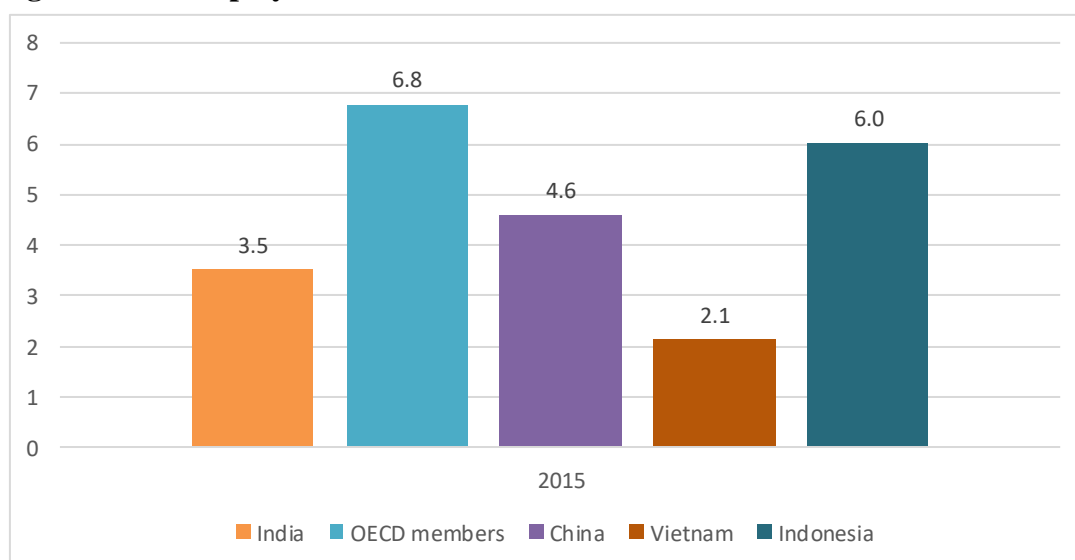
As OECD (2017) states, demonetisation should bring in long-term benefits, although in short-term it has had transitory costs. In short-term, the most affected group by demonetisation would have been the low-income workers and households. As the

demonetisation targets also on the informal economy, and poor usually work in the informal sector (farming, small retailers etc.), and are not able to move to non-cash payments.

4.1.3 Unemployment Rate and Labour Force

Unemployment affects both, directly and indirectly, hundreds of millions of people globally. In India, a country with about half of the population below the age of 27 (Figure 25), the way of how the government will manage unemployment and new jobs creation will be one of the crucial elements of further economic growth. Although unemployment rate in the year 2015 was around half of the developed countries, 3.5% unemployment rate in India compared to 6.8 % unemployment rated in OECD countries (Figure 14). This might thus suggest, that problem with unemployment in India and other developing countries is more structural.

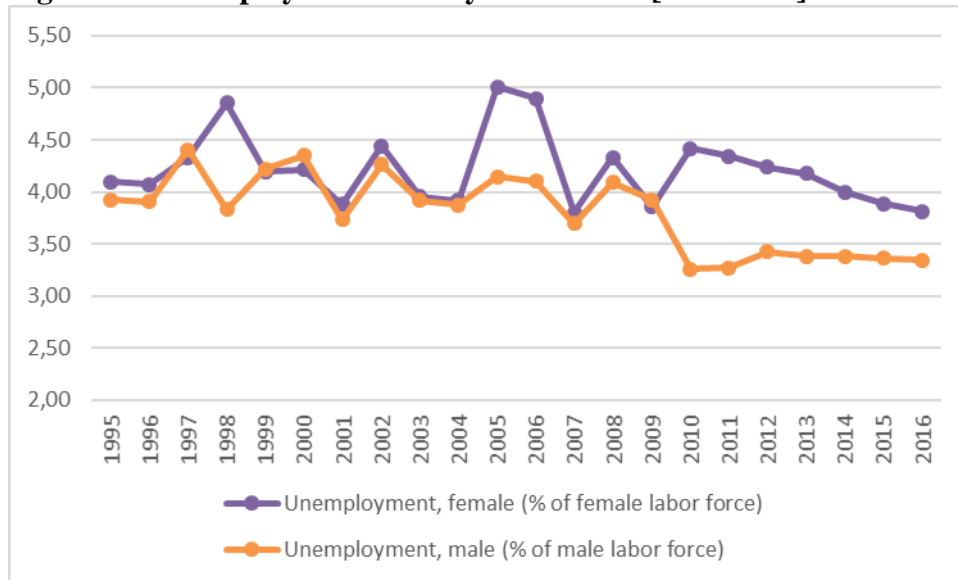
Figure 14: Unemployment Rate in Selected Countries [annual %]



(Source: Data provided by World Bank, 2017)

Figure 15 displays the differences in the unemployment rate between genders. Generally, women’s unemployment rate is higher, than men’s unemployment rate. Highest differences appeared in 1998, 2005 to 2006, and in 2010, when the difference was about 1% between men and women. Since then, annual unemployment rate difference between genders has been decreasing, although the difference is still relatively high.

Figure 15: Unemployment Rate by the Gender [annual %]



(Source: Data provided by World Bank, 2017)

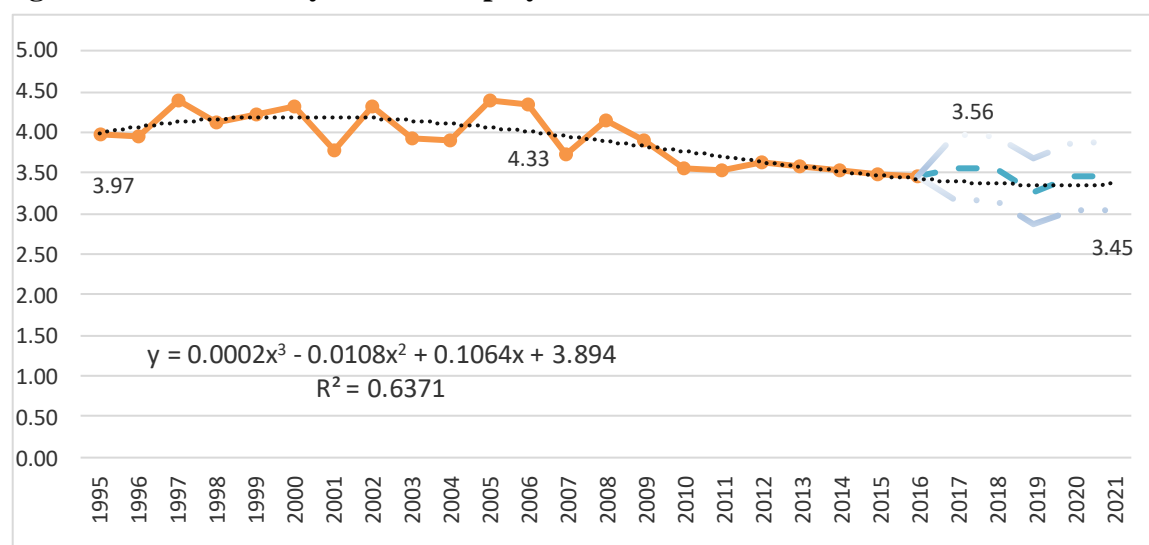
Trend analysis of unemployment rate is displayed in Figure 16. Equation of the trend is $y = 0.0002x^3 - 0.0108x^2 + 0.1064x + 3.894$ and coefficient of determination (R^2) is equal to 0.6371 (Figure 16). This means that development of unemployment rate can be explained only from about 64% by the polynomial trend of the third degree. The coefficient of determination is quite low; therefore, the forecast of future values is made in MS Excel 2016 and is based on the method of exponential smoothing with added seasonality effect. Figure 16 also displays the forecast of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of unemployment rate for the year 2021 will be with 95% probability between 3.04% and 3.86%. The estimated value for the year 2021 is therefore 3.45%, all other estimated values for years 2017 – 2021 are displayed in Table 9.

Table 9: Estimated Future Unemployment Rate [annual %]

Year	2017	2018	2019	2020	2021
<i>LCL</i>	3.16	3.15	2.85	3.05	3.04
Prognosis	3.56	3.55	3.26	3.46	3.45
<i>UCL</i>	3.96	3.96	3.67	3.87	3.86

(Source: Own calculation)

Figure 16: Trend Analysis of Unemployment Rate [annual %]



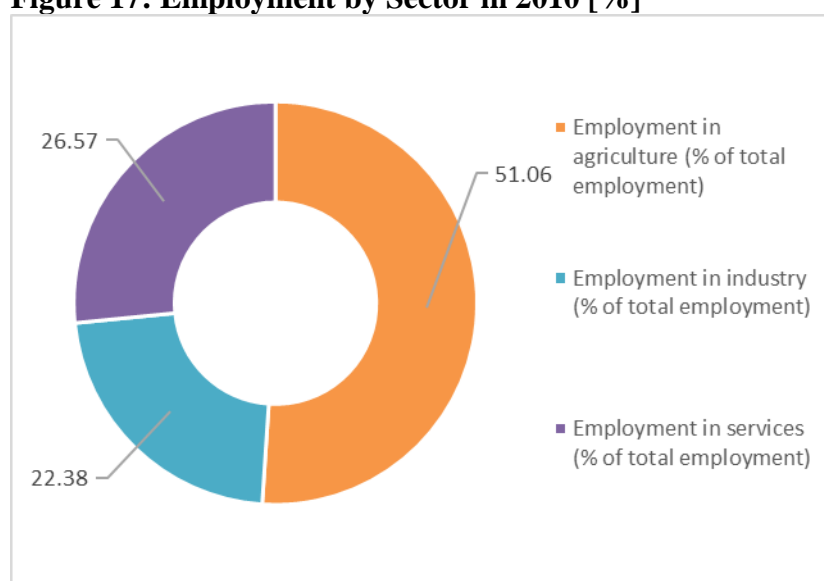
(Source: Data provided by World Bank, 2017)

From Figure 16 is apparent that the unemployment rate had been fluctuating between 3.5% and 4.5% in the period from 1995 to 2012, in terms of unemployment rate, it seems that the impact of the global financial crisis in 2008 has not been so devastating as in e.g. developed countries. Since 2010, the unemployment rate has been steadily decreasing. As mentioned before, the problem in India is not about the unemployment rate, which is low compared to other countries. The problem lies in the structure of employment together with the large and young population. According to ILO, unemployment in India should exceed 18 million people in the year 2018 at rate about 3.4%, which corresponds with estimation made in this thesis (Table 9). International Labour Organization in its World Employment and Social Outlook (2017) stresses the problematics of vulnerable forms of employment that does not grant workers any security scheme, such as contributing family workers, or own account workers. Furthermore, four

out of five workers in developing/emerging countries are in vulnerable forms of employment.

Moreover, the structure of the employment by economic sectors does not correspond to the contribution of each sector to the GDP. In 2010, agriculture accounted for 51% of the workforce, while its contribution to the GDP was lowest with 18.9% of GDP or about 290 billion USD, compared to 22% in industry, with contribution of 32% to the GDP or 498 billion USD and about 27% in services with contribution of about 49% to the GDP or 748 billion USD (Figure 17). Despite various policy initiatives, the manufacturing sector has not been able to create mass employment, unlike in countries such as China. Further, casual and contractual employment is replacing permanent jobs in the manufacturing sector (World Bank, 2017).

Figure 17: Employment by Sector in 2010 [%]

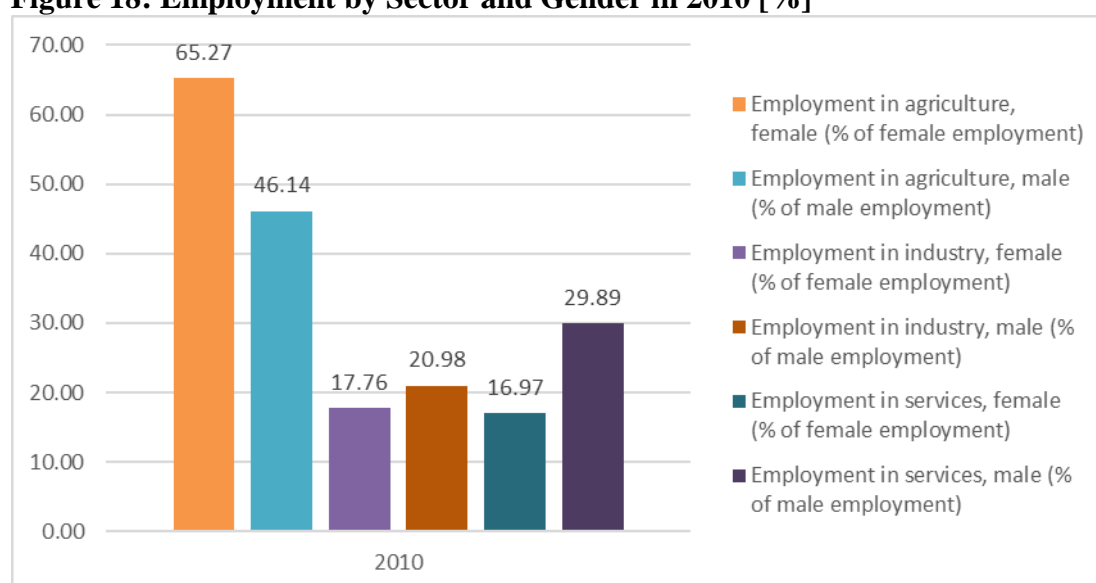


(Source: Data provided by World Bank. 2017)

Considering employment by sectors and gender, from Figure 18 is obvious, that women work mostly in agriculture, with 65% of all employed women in 2010. Increasing participation of women in the labour market is one of the key challenges of India's growth. Although the share of women employed in agriculture has been declining, it is still about 20% more than the share of men (Figure 18). Which means, women remain tied to farm-based work with low salary, working usually on family farms. The share of women in

traditional services such as hotels, restaurants, trade etc. is low, the better situation is in case of education, administration, or health, but in those sectors, the share of women is still lower than in other countries. The reason why women do not have a higher share in other sectors can be also found in Indian labour laws. Maternity benefits in India are not at the same level as in other countries, women are prevented from certain types of jobs by law, and flexibility of regular wage jobs is on low level as well (World Bank, 2017)

Figure 18: Employment by Sector and Gender in 2010 [%]



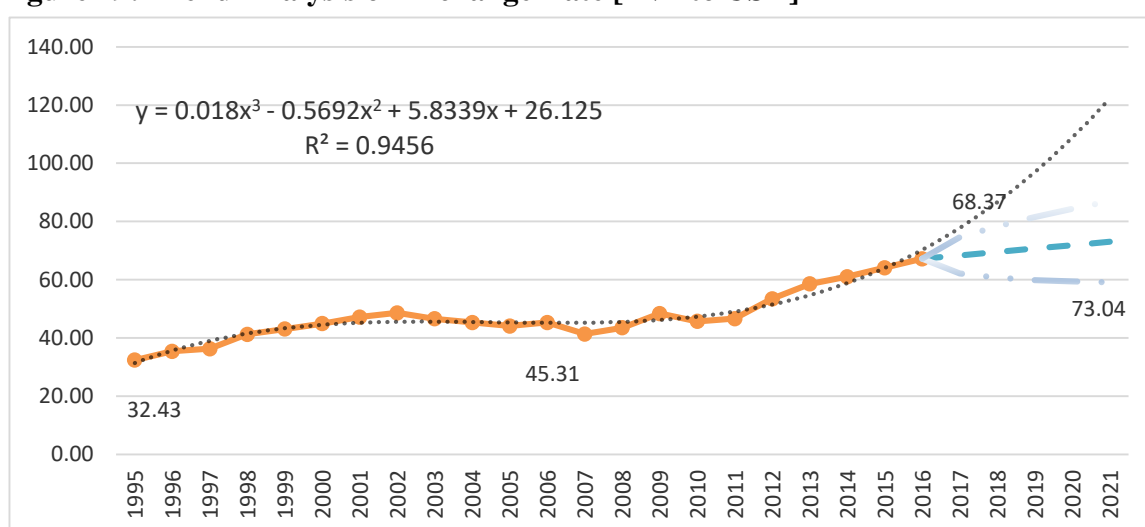
(Source: Data provided by World Bank, 2017)

4.1.4 Exchange Rate

The exchange rate is a very important macroeconomic factor, as it can be perceived as the most important price in the economy. Since 1993 when India moved towards market-determined exchange rates, Indian Rupee has generally depreciated against the US Dollar. After the Asian crisis, particularly after the years 2002 to 2003, capital flows into India surged creating space for speculation on the Indian rupee. The Reserve Bank intervened actively in the forex market to reduce the volatility in the market. During this period, the Reserve Bank made direct interventions in the market through purchases and sales of the US Dollars in the forex market and sterilised its impact on the monetary base. Exceptions to the depreciating tendency of Rupee have appeared during period 2003-2005

and during 2007-2008 (Figure 19) when the Rupee had appreciated because of the global weakness of Dollar and large capital inflows due to the financial crisis. The Rupee has also depreciated against other major international currencies. Another important feature has been the reduction in the volatility of the Indian exchange rate. Among all currencies worldwide, and certainly, among all emerging market economies, the volatility of the rupee-dollar rate has remained low. Moreover, the rupee in real terms generally witnessed stability over the years despite volatility in capital flows and trade flows (RBI, 2010)

Figure 19: Trend Analysis of Exchange Rate [INR to USD]



(Source: Data provided by OECD, 2017)

Figure 19 displays the trend analysis of exchange rate of Indian rupee to US Dollar. The equation of the trend is $y = 0.018x^3 - 0.5692x^2 + 5.8339x + 26.125$ with coefficient of determination (R^2) equal to 0.9456. This means that development exchange rate can be explained by about 95% by polynomial trend line of the third degree. The estimation of future values is although created by forecast function in MS Excel 2016 with the method of exponential smoothing. Figure 19 also displays the estimation of the future values, together with confidence interval $\alpha = 95\%$. It can be thus said, that the estimated future value of inflation rate for the year 2021 will be with a probability of 95% between 59.08 Rupees for one USD and 87.01 Rupees for one USD. The estimated value for the year 2021 is thus 73.04 INR to USD. Although from the trend line function in Figure 19 and its high R^2 can

be predicted, that the future values of the exchange rate will be probably closer to the upper confidence level rather than to lower confidence level.

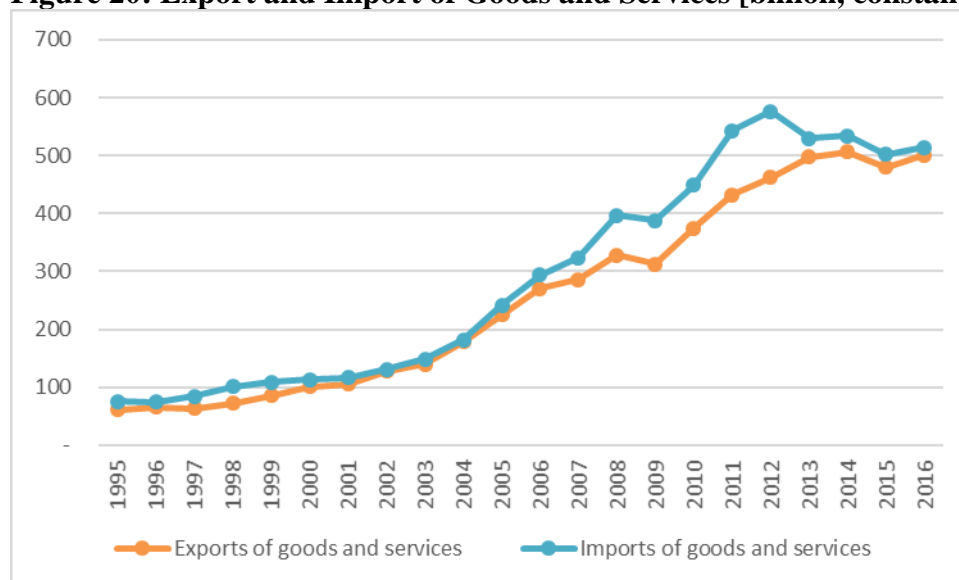
Table 10: Estimated Future Exchange Rate [INR to USD]

Year	2017	2018	2019	2020	2021
<i>LCL</i>	62.13	60.71	59.90	59.39	59.08
Prognosis	68.37	69.54	70.71	71.87	73.04
<i>UCL</i>	74.61	78.36	81.51	84.36	87.01

(Source: Own calculation)

4.1.5 Trade Balance

Figure 20: Export and Import of Goods and Services [billion, constant 2010 USD]



(Source: Data provided by World Bank, 2017)

Figure 20 shows the number of imports and exports of goods and services between 1995 and 2016. It is clear, that India has been a net importer, which corresponds with its large population. Since 2008, the difference between exports and imports started to increase and peaked in 2012, when imports of goods and services exceeded exports by about 114 billion USD. Since 2013, the gap between imports and exports has started to decrease again, when in 2016, the difference was lowest in 10 years since 2006, imports exceeded exports by about 12.5 billion (Figure 21). In total figures, Figure 20 displays rising trend with two slight drops in 2009 after the worldwide crisis and in 2013, within the

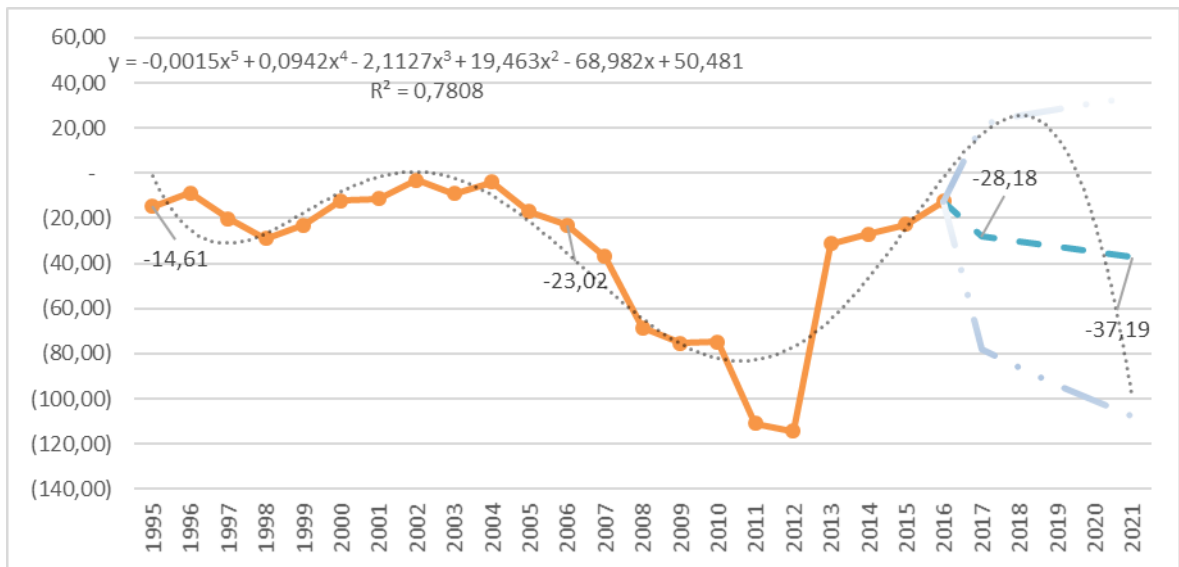
observed period. While in 1995, the value of imports of goods and services accounted for about 76 billion USD, in 2016 it was already about 514 billion USD, which represents 85% increase in the value of imports of goods and services between 1995 and 2016.

In case of exports, the value had risen from about 61 billion USD to about 501 billion USD, which represents even 88% increase between 1995 and 2016 (Appendix). Development of share of imports and exports of goods and services in GDP corresponds with the development of total values. In 1995 share of imports in GDP accounted for about 12% of GDP, in 2016 it was about 20% of GDP, which represents 41% increase between 1995 and 2015. In case of exports, in 1995 share in GDP was about 11%, and in 2016 it was about 19% of GDP. This represents a 43% increase within the observed period (Appendix).

In 2016, India was the 18th largest export economy and 14th largest import economy in the world. The most important exported commodities are refined petroleum with 9.9% share in all exported commodities), diamonds (9.3%), jewellery (4.9%), packaged medicaments (4.5%), cars (2.5%) and rice with 2.1% share of all exports. The top destinations for Indian exports are thus: USA (16%), United Arab Emirates (12%), Hong Kong (5.1%) China (3.5%), and United Kingdom with 3.3% of all commodities exported to the UK.

In case of imports, the top imported commodities were: crude petroleum (18%), gold (6.6%), diamonds (5.5%), coal briquettes (3.7%), telephones (3.1%), in case of foodstuff products, the top imported commodities are palm oil (1.6%) and dried legumes (1.2%). The most important countries of origin for Indian imports are China (18%), USA (5.9%), United Arab Emirates (5.6%), Saudi Arabia (5.4%), and Switzerland (4.3%) (OEC, 2017).

Figure 21: Trend Analysis of Trade Balance [billion, constant 2010 USD]



(Source: Data provided by World Bank, 2017)

Figure 21 displays trend analysis of India's trade balance (exports-imports). The equation is $y = -0.0015x^5 + 0.0942x^4 - 2.1127x^3 + 19.463x^2 - 68.982x + 50.481$ with coefficient of determination (R^2) equal to 0.7808. This means that development of trade balance can be best explained by about 78% by the polynomial trend of the fifth degree. The forecast function in MS Excel 2016 is used for determination of future values. Figure 21 also displays the forecast of the future values, together with confidence intervals at the level of importance $\alpha = 95\%$. It can be thus said, that the estimated future value of trade balance for the year 2021 will be with a probability of 95% between -107.76 billion USD and 33.38 billion USD. This wide range is given by the polynomial trend, although it is unlikely that exports of goods and services would exceed imports in near future, which is given by the size of the population as well as the structure of exported goods (Reuters, 2013). In table 11 are listed all forecasted future values of India's trade balance together with lower and upper confidence levels.

Table 11: Estimated Values of Indian Trade Balance [billion, constant 2010 USD]

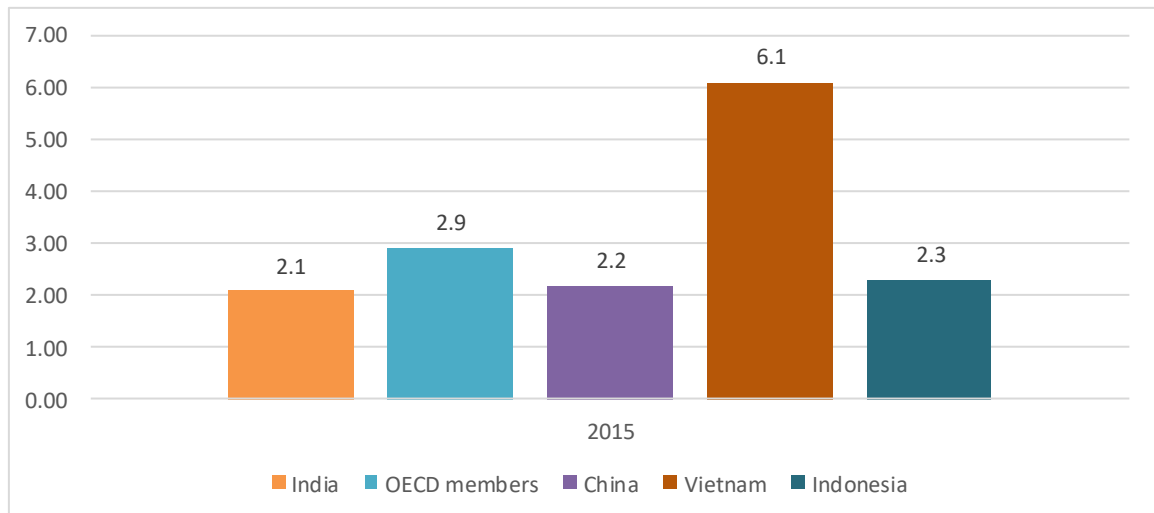
Year	2017	2018	2019	2020	2021
<i>LCL</i>	-77.95	-86.10	-93.70	-100.89	-107.76
Prognosis	-28.18	-30.43	-32.68	-34.94	-37.19
<i>UCL</i>	21.60	25.24	28.34	31.03	33.38

(Source: Own calculation)

4.1.6 Foreign Direct Investment

FDI is one of the key consequences of globalisation, and many researchers have studied the impact of FDI inflows on economic growth (see Agrawal and Khan, 2001).

Figure 22: FDI inflows in Selected Countries [% of GDP]



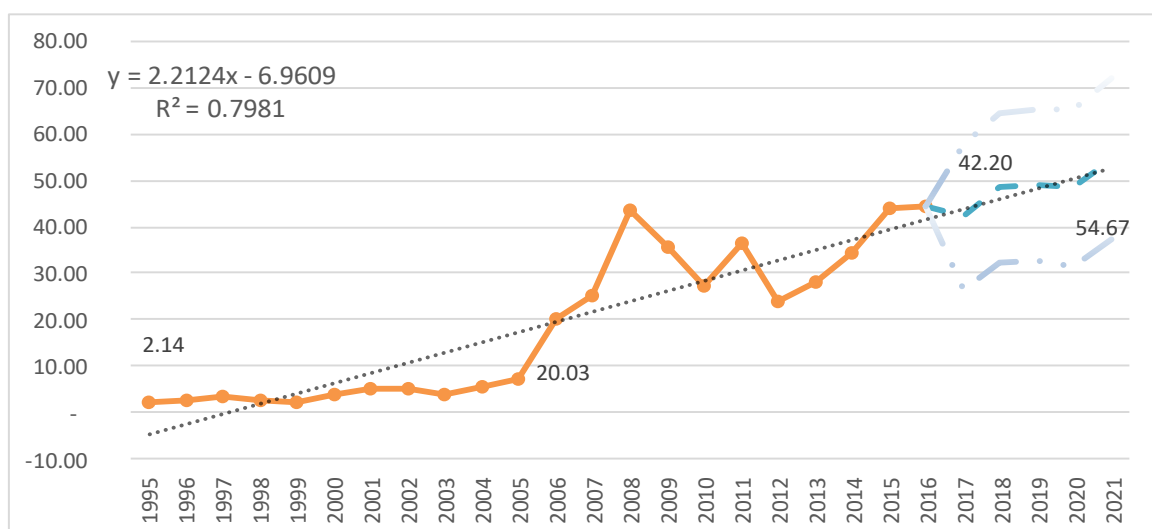
(Source: Data provided by World Bank)

Figure 22 shows foreign direct investment inflows in a selected group of countries as share of GDP in year 2015. In India, as well as in China and Indonesia, FDI inflows accounted for about 2% of GDP. In developed countries represented by OECD members average, FDI inflows were almost 3% of GDP. Only in Vietnam FDI accounted for more than 6% of GDP. Except Vietnam, Figure 22 displays that there are no significant differences between developed and emerging countries, in case of FDI inflows as share of GDP of a given country.

From 1995 to 2005, there was steady but sluggish growth in FDI inflows in India. Since 2005, besides as a result of liberalization policies in 1990s and other governmental

measures (Mamata, 2010), FDI inflows has been increasing rapidly. Although overall Asian countries showed quite resilience during the financial crisis, India's FDI inflows have decreased by about 16 billion USD between 2008 – 2010 (Figure 23). In 2014, Indian government introduced new measures to get back on track and promote FDI. FDI deregulation focused on civil aviation, agriculture, railways and construction, agriculture, or defence, and reduced the administration processes connected to FDI inflows (OECD, 2017).

Figure 23: Trend Analysis of FDI inflows [billion, current USD]



(Source: Data provided by World Bank, 2017)

Figure 23 displays the trend analysis of foreign direct investment inflows. The equation of the trend is $y = 2.2124x - 6.9609$, and the coefficient of determination (R^2) equals to 0.7981. Development of FDI inflows can be thus explained from about 80% by linear trend line. The estimation of future values is although created by forecast function in MS Excel 2016 with method of exponential smoothing and added seasonality. Figure 23 also displays the estimation of the future values, together with confidence interval $\alpha = 95\%$. Therefore, future value of FDI inflows for year 2021 has been estimated to 54.67 billion USD, lower confidence level value for year 2021 has been estimated to 37.21 billion USD and upper confidence to 72.13 billion USD. All estimated values with lower and upper confidence level are shown in Table 12

Table 12: Estimated Future Values of FDI inflows [billion, current USD]

Year	2017	2018	2019	2020	2021
<i>LCL</i>	26.63	32.38	32.53	31.48	37.21
Prognosis	42.20	48.44	49.06	48.49	54.67
<i>UCL</i>	57.77	64.49	65.59	65.49	72.13

(Source: Own calculation)

4.2 Trend Analysis of Socio-Economic Indicators

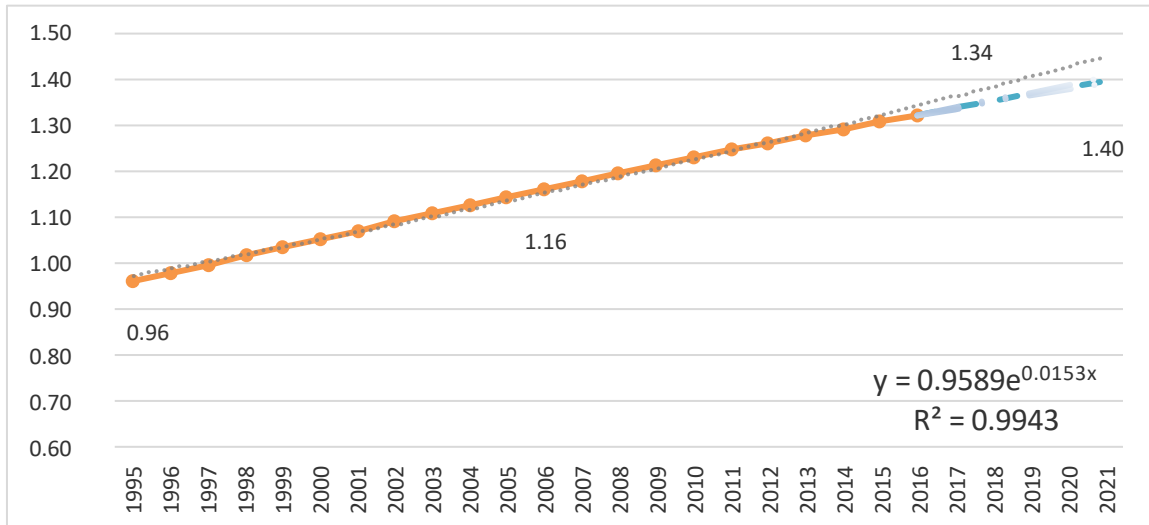
4.2.1 Demography

Demography has always been an alluring statistical indicator, as it demonstrates the composition of population – how many inhabitants lives in the region, how many has moved, number of births and deaths etc. For India, the second most populous country in the world with one half of population younger than 27 years of age, the demographic development is crucial for further the economic development

According to the latest data, in India live more than 1.34 (2017 est.) billion people (UN, 2017). In case of ethnicity, 72% of population belong to Indo-Aryan ethnic group, 25% to Dravidian and 3% to mongoloid and other ethnic groups (CIA, 2017). But the official national Census of India (last in 2011) does not recognise ethnic groups, it recognises tribal groups as Scheduled Castes and Tribes.

Population growth rate is stable 1.2% annually, while between 60's and 90's of the twentieth century, there was a population boom with growth rate over than 2% (World Bank, 2017).

Figure 24: Trend Analysis of Indian Population [Billion]



(Source: Data provided by World Bank, 2017)

Figure 24 displays the trend analysis of Indian population growth. The equation of the trend is $y = 0.9589e^{0.0153x}$, and the coefficient of determination (R^2) is equal to $R^2 = 0.9943$. Therefore, the growth of Indian population can be explained from very satisfying 99% by exponential trend. The estimation of future values is created by forecast function in MS Excel 2016 using method of exponential smoothing. Figure 24 also displays the estimation of future values, together with confidence interval $\alpha = 95\%$. Therefore, for year 2021 the population number has been estimated to 1.40 billion people. In 2024, population of India is estimated to surpass China, and become the most populous country in the world. All estimated values with lower and upper confidence level are shown in Table 13.

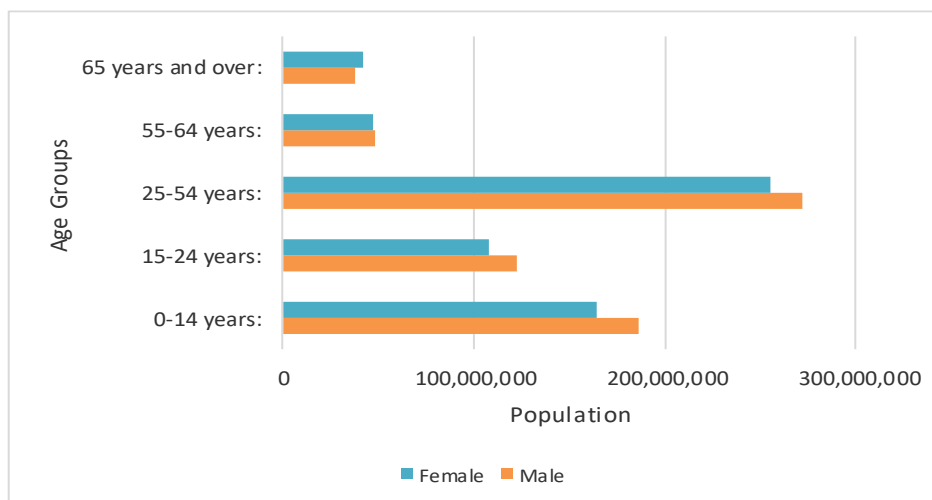
Table 13: Estimated Future Values of Indian Population [billion]

Year	2017	2018	2019	2020	2021
LCL	1.34	1.35	1.37	1.38	1.39
Prognosis	1.34	1.35	1.37	1.38	1.40
UCL	1.34	1.36	1.37	1.39	1.40

(Source: Own calculation)

Age structure of India is completely different than in the developed countries. Median age of population in India is 27.6 years (26.9 for men, 28.3 for women). Such young population is one of typical indicators for developing countries in the demographic transition. This could represent an obstacle in terms of problematic involvement of youth in the working process. But on the other hand, with support of education and growth of the economy, young population can lead to even faster development of the country. In comparison to aging population of developed countries, this youthful structure of population has higher potential to the future (CIA, 2017).

Figure 25: Age Structure of Indian Population



(Source: Data adapted from CIA, 2017)

India has 22 languages recognised by the constitution and 31 languages have received the status of official languages. Hindi is the official language of Indian Union, but there is no national language determined by the Indian Constitution. English enjoys the status of subsidiary official language, but certainly is the most important language for national, political and business communication. The most spoken language is abovementioned Hindi (41%), followed by Bengali (8.1%), Telugu (7.2%) or Marathi (7%) and others.

Religion and caste system still plays an important role in Indian society, although discrimination based on caste system is officially prohibited by Indian constitution since 1950. Traditional Hindi cast system recognises five casts, which stratify society: Brahmins (priests, teachers), Kshatriyas (warriors, rulers), Vaishyas (farmers, traders, merchants),

Shudras (labourers), and Dalits also called untouchables (endogenous tribes, another religions). Except official languages, there are 780 registered languages, but more than 1,700 languages are spoken around India (CIA, 2017; Readme India, 2016).

4.2.2 Urbanization

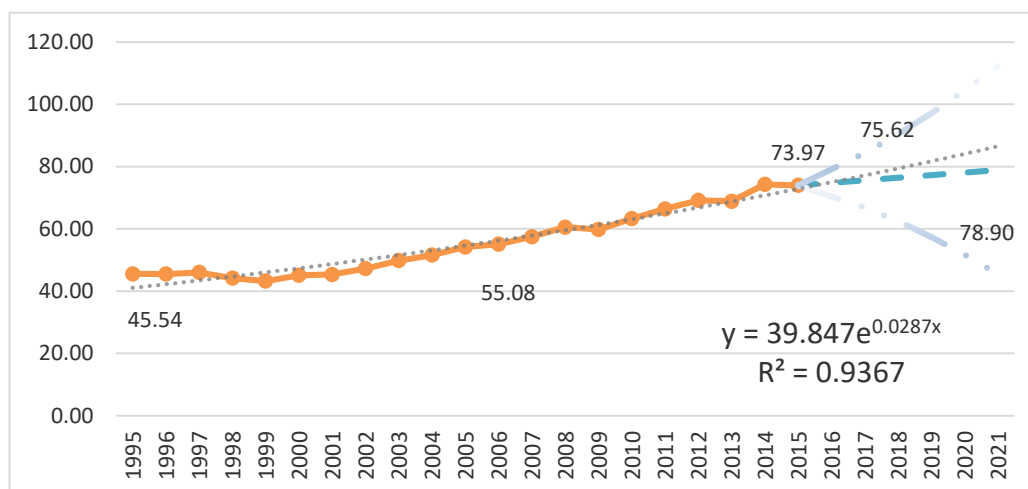
India still belongs among countries with high share of inhabitants (66.5%) living in the countryside. Urban population (33.5%) is low compared to world average (54% in 2016). On the other hand, although the rate of urbanisation has decreasing tendency, 3.9% in 1970 compared to 2.3% in 2016, the urbanisation process in India is still fast. The population of major urban areas such as New Delhi (capital) with 25 million inhabitants or Mumbai with 21 million inhabitants will continue to grow (CIA, 2017, Worldbank, 2017).

4.2.3 Education

Education should be one of key drivers of economic growth. India's education system is one of the largest and most complex education systems in the world. According to last census in 2011, adult literacy rate in India was 69.3%, while in 2001 it was 61%. Although literacy rate is different for men and women. In 2011 literacy rate of women was only 59.3%, while literacy rate of men was 78.9% (World Bank, 2017). This situation presents large space for improvement. Indian government realises importance of education, as public spending education increased from 3.3% of GDP in 2005 to 4% in 2012. Indian schools are owned by the government (central, state, or local government bodies), or by private sector. Indian education system is basically structured as follows (British Council, 2014):

- Pre-Primary (18 months – 5 years of age)
- Primary – classes 1 to 5 (6 years – ten years)
- Upper Primary / Middle School – classes 6 to 8 (11 years – 14 years)
- Secondary – classes 9 to 10 (14 years to 16 years)
- Higher Secondary – classes 11 to 12 (16 years to 18)
- Tertiary – university education

Figure 26: Trend Analysis of Secondary Education Enrolment [%]



Source: Data provided by World Bank, 2017

For the analysis of Indian education development is used data set for secondary education enrolment. Especially because of availability of data. Figure 26 displays the trend analysis of secondary education enrolment. The equation of the trend is $y = 39.847e^{0.0287x}$, and the coefficient of determination (R^2) is equal to 0.9367. Therefore, the development of Indian secondary education enrolment can be explained from about 94% by exponential trend. The estimation of future values is created by forecast function in MS Excel 2016 using method of exponential smoothing. Figure 26 also displays the estimation of future values, together with confidence interval $\alpha = 95\%$. Therefore, for year 2021 the population number has been estimated to 78.9% of young people will be enrolled for secondary level of education. All estimated values with lower and upper confidence levels are shown in Table 14.

Table 14: Estimated Future Values of Secondary Education Enrolment [%]

Year	2017	2018	2019	2020	2021
LCL	66.87	62.50	57.43	51.72	45.44
Prognosis	75.62	76.44	77.26	78.08	78.90
UCL	84.37	90.37	97.08	104.43	112.35

(Source: Own calculation)

4.3 Econometric Model

In this chapter, one-equation econometric model is used to evaluate how the selected macroeconomic and socio-economic indicators affect Indian economic growth. The econometric model is based on economic model and the analysis tries to explore the dependency of GDP growth on population, inflation rate, unemployment rate, exchange rate, population growth, trade balance, FDI inflow, life expectancy, number of new patents and secondary education enrolment.

Table 15: Declaration of Variables

	Variable	Type of the variable	Units
y₁	GDP growth	Endogenous	Annual %
x₁	Unit vector	Exogenous	
x₂	Inflation (CPI)	Exogenous	Annual %
x₃	Exchange rate	Exogenous	INR to USD
x₄	Unemployment rate	Exogenous	Annual %
x₅	Population growth	Exogenous	Annual %
x₆	Trade balance (export-import)	Exogenous	Billion, constant 2010 USD
x₇	Foreign Direct Investment inflow	Exogenous	% of GDP
x₈	Life expectancy	Exogenous	years
x₉	Number of new patents	Exogenous	
x₁₀	Secondary education enrolment	Exogenous	% of population
u₁	Error term	Stochastic	

(Source: Own elaboration)

The basic assumption of economic model is that GDP growth will be influenced by the exogenous variables, the further assumptions are thus as follow:

- Increase in inflation causes decrease in GDP growth
- Increase in exchange rate of INR to USD causes decrease in GDP growth
- Increase in unemployment rate causes decrease in GDP growth
- Increase in population growth causes increase in GDP growth
- Increase in trade balance causes increase in GDP growth
- Increase in FDI inflow causes increase in GDP growth
- Increase in life expectancy causes increase in GDP growth
- Increase in number of new patents causes increase in GDP growth
- Increase in secondary school enrolment causes increase in GDP growth

The economic model is thus as follows:

$$y_t = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10})$$

The one-equation econometric model must contain a unit vector and the error term (stochastic variable) u_t . All variable, their types and units are specified in Table 15. The econometric model is based on the economic model with GDP growth as an endogenous (explained) variable and inflation rate, exchange rate, unemployment rate, population growth, trade balance, FDI inflows, life expectancy, number of new patents, and secondary education enrolment as exogenous (explanatory variables). The econometric model is thus as follows:

$$y_{1t} = \gamma_{11}x_{1t} + \gamma_{12}x_{2t} + \gamma_{13}x_{3t} + \gamma_{14}x_{4t} + \gamma_{15}x_{5t} + \gamma_{16}x_{6t} + \gamma_{17}x_{7t} + \gamma_{18}x_{8t} + \gamma_{19}x_{9t} + \gamma_{110}x_{10t} + u_{1t}$$

Table 16: Data Set

	y1	X2	X3	X4	X5	X6	X7	X8	X9	X10
1995	7.57	10.22	32.43	3.97	1.92	-14.61	0.60	60.42	1.55	45.54
1996	7.55	8.98	35.43	3.95	1.90	-8.89	0.63	60.89	1.66	45.48
1997	4.05	7.16	36.31	4.39	1.87	-20.20	0.87	61.34	1.93	46.03
1998	6.18	13.23	41.26	4.12	1.84	-28.85	0.63	61.78	2.25	44.15
1999	8.85	4.67	43.06	4.22	1.81	-22.88	0.48	62.19	2.21	43.22
2000	3.84	4.01	44.94	4.31	1.77	-12.30	0.78	62.59	2.21	45.06
2001	4.82	3.68	47.19	3.78	1.73	-11.28	1.07	62.99	2.38	45.34
2002	3.80	4.39	48.61	4.32	1.70	-3.04	1.03	63.37	2.69	47.27
2003	7.86	3.81	46.58	3.93	1.66	-8.96	0.61	63.76	3.43	49.82
2004	7.92	3.77	45.32	3.89	1.62	-3.97	0.78	64.16	4.01	51.57
2005	9.28	4.25	44.10	4.40	1.58	-16.87	0.90	64.56	4.72	54.17
2006	9.26	6.15	45.31	4.33	1.55	-23.02	2.18	64.97	5.69	55.08
2007	9.80	6.37	41.35	3.72	1.51	-36.91	2.10	65.39	6.30	57.48
2008	3.89	8.35	43.51	4.15	1.47	-68.54	3.66	65.81	6.43	60.56
2009	8.48	10.88	48.41	3.91	1.42	-75.44	2.69	66.23	7.26	59.79
2010	10.26	11.99	45.73	3.55	1.37	-74.68	1.65	66.64	8.85	63.29
2011	6.64	8.86	46.67	3.54	1.31	-110.93	2.00	67.03	8.84	66.42
2012	5.46	9.31	53.44	3.62	1.26	-114.22	1.31	67.40	9.55	69.16
2013	6.39	10.91	58.60	3.57	1.22	-31.29	1.52	67.74	10.67	68.90
2014	7.51	6.65	61.03	3.53	1.19	-27.05	1.70	68.05	12.04	74.28
2015	8.01	4.91	64.15	3.49	1.17	-22.58	2.08	68.33	12.58	73.97

(Source: Data provided by World Bank, OECD, 2017)

Because of the data availability, the data set uses observations from year 1995 to 2015 (Table 16).

The correlation matrix has been created to identify high multicollinearity (dependency) in the model. The correlation matrix is always a square matrix, which has only ones on its diagonal. Other elements in the matrix have values in the interval (-1,1), and high and inappropriate multicollinearity have correlations, that have coefficient higher than 0.8 in absolute value. If there is a high multicollinearity in the model, it can be reduced by appropriate transforming of the original data set (e.g. gradual differences), using dummy variable, or omitting the variable which causes the multicollinearity.

Table 17: Correlation Matrix with High Multicollinearity

y1	x2	x3	x4	x5	x6	x7	x8	x9	x10	
1	0.0898	0.0116	-0.2671	-0.2091	-0.0241	0.0351	0.195	0.2490	0.2066	y1
	1	-0.1264	-0.3018	-0.1493	-0.5339	0.2205	0.1154	0.2275	0.2299	x2
		1	-0.5697	-0.8373	-0.1836	0.3262	0.8286	0.8217	0.7809	x3
			1	0.7053	0.4519	-0.2617	-0.6686	-0.7405	-0.7295	x4
				1	0.5689	-0.6226	-0.9955	-0.9804	-0.9763	x5
					1	-0.5419	-0.5681	-0.5349	-0.5729	x6
						1	0.6535	0.5923	0.6141	x7
							1	0.9632	0.9567	x8
								1	0.9907	x9
									1	x10

(Source: Calculation provided by SW Gretl, 2017)

High multicollinearity appeared among variables exchange rate (x3), population growth rate (x5), life expectancy (x8) and secondary education enrolment (x10) (Table 17). Correlation among these variables can be caused by the spurious relationship, although the variables in the model are not casually related to each other. Spurious relationship appears can appear as the result of presence of an unseen factor, or simply coincidence.

Therefore, the method of gradual differences has been chosen to reduce multicollinearity in this model. Method of gradual differences shortens the number of observations, as the new value for year 1996 is calculated as original value of 1996 – original value of 1995. Therefore, it is necessary to omit observations for year 1995. New correlation matrix is as follows:

Table 18: Correlation Matrix with First Differences

y1	x2	d_x3	x4	d_x5	x6	x7	d_x8	x9	d_x10	
1	0,0782	-0,4361	-0,2691	-0,0410	-0,0331	0,0499	-0,0396	0,2741	0,0304	y1
	1	0,4144	-0,3151	-0,2633	-0,5858	0,2835	0,2186	0,3019	-0,1815	x2
		1	-0,1056	0,1138	-0,2604	0,0773	-0,1968	0,2002	-0,4374	d_x3
			1	0,3101	0,4532	-0,2630	0,5506	-0,7598	-0,2449	x4
				1	0,7281	-0,2808	-0,0666	-0,2436	-0,3856	d_x5
					1	-0,5291	0,0296	-0,5214	-0,2796	x6
						1	-0,1795	0,5685	0,2437	x7
							1	-0,7574	-0,2619	d_x8
								1	0,3659	x9
									1	d_x10

(Source: Calculation provided by SW Gretl, 2017)

The new correlation matrix does not contain any cases of high multicollinearity. In case of endogenous variable y1, the strong dependency between y1 and other variables is desirable. From the correlation matrix (Table 18 is obvious that no strong dependency is present. As a stronger dependence can be considered relationship between y1 (GDP growth) and d_x3 (gradual difference of exchange rate) with index of correlation -0.4361. Moderate dependence can be found between GDP growth and number of new patents (x9) with correlation index 0.2741, and unemployment rate (x4) with correlation index -0.2931. Other exogenous variables have no significant dependency to the GDP growth.

Parameters of econometric model are estimated by using ordinary least square method in Gretl. Matrix X (values of exogenous variables) and vector y (values of endogenous variables) were estimated by the formula $(X^T X)^{-1} X^T y$ and SW Gretl (see Appendix). Estimated values of OLS parameters are in Table 19.

Estimated form of one-equation econometric model is thus:

$$y_{1t} = -20.3969 - 0.273313x_{2t} - 0.472743x_{3t} + 0.976158x_{4t} + 4.29783x_{5t} + 0,00731903x_{6t} - 1.35235x_{7t} + 56.5707x_{8t} + 1.23836x_{9t} - 0.655355x_{10t} + u_{1t}$$

Table 19: Parameters estimated by OLS

X1	X2	D_X3	X4	D_X5
-20.3969	-0.273313	-0.472743	0.976158	4.29783
X6	X7	D_X8	X9	D_X10
0,00731903	-1.35235	56.5707	1.23836	- 0.655355

(Source: Own elaboration)

4.3.1 Economic verification

Economic verification evaluates the way and intensity of effect of explanatory variables on the explained variable.

- If other variables are equal to zero, annual GDP growth rate is equal to -20.3 %
- If the inflation increases by 1% annually, the GDP growth rate decreases by 0.2% annually. This corresponds to the assumption.
- If first differences of exchange rate increase by 1 INR to USD, the GDP growth rate decreases by 0.4% annually. This corresponds to the assumption.
- If unemployment rate increases by 1% annually, the GDP growth rate increases by 0.9% annually. This does not correspond to the assumption.
- If first differences of population growth rate increase by 1%, the GDP growth rate increases by 4.3% annually. This corresponds to the assumption.
- If trade balance increases by 1 billion USD in 2010 constant prices, GDP growth increases by 0.007% annually. This corresponds to the assumption.
- If FDI inflows increase by 1% of GDP, the GDP growth rate decreases by 1.35% annually. This does not correspond to the assumption.
- If first differences of life expectancy increase by 1 year, the GDP growth increases by 56.57 % annually. This corresponds to the assumption, but the value is too high.
- If number of new patents increases by 1 thousand, GDP growth rate increases by 1.2% annually. This corresponds to the assumption.
- If first differences of secondary school enrolment increase by 1%, the GDP growth rate decreases by 0.65% annually. This does not correspond to the assumption.

4.3.2 Statistical verification

Statistical verification is used for evaluation of conformity of model data with the statistical significance of structural parameters.

Table 20: OLS and modified OLS, using observations 1996-2015 (T=20)

	Coefficient	p-value		Coefficient	p-value
X1	-20.3969	0.2324	X1	-20.8064	0.1672
X2	-0.273313	0.3299	X2	-0.274368	0.3032
d_X3	-0.472743	0.0701 *	d_X3	-0.467268	0.0456 **
X4	0.976158	0.6383	X4	0.994587	0.6113
d_X5	4.29783	0.9496	X6	0.00868798	0.6559
X6	0.00731903	0.8059	X7	-1.35302	0.0752 *
X7	-1.35235	0.0907 *	d_X8	57.0139	0.0718 *
d_X8	56.5707	0.0960 *	X9	1.24734	0.0148 **
X9	1.23836	0.0259 **	d_X10	-0.656940	0.0418 **
d_X10	-0.655355	0.0538 *			

(Source: Data provided by Gretl, 2017)

Table 20 (on the left side) displays statistical significance of tested parameters based on OLS method. P-values shows, that only variable x9 (number of new patents) is statistically significant at the level of significance $\alpha = 0.05$. The other variables d_X3 (first differences of exchange rate), x7 (FDI inflows), d_x8 (life expectancy), and d_x10 (first differences of secondary education enrolment) are significant at level of significance $\alpha = 0.1$. As the model includes some superfluous variables (d_x5, x6) according to the p-values, which add nothing to the total variance explained by the regression equation. Therefore, the model is going to be transformed by omitting variable with the highest p-value d_x5 (first difference of population growth).

After modification of the model (Table 20 on the right) by omitting variable d_x5, statistical significance of explanatory variables has increased. Three variables (d_x3, x9, d_x10) are now statistically significant at the level $\alpha = 0.05$, and two (x7, d_x8) at the level $\alpha = 0.1$.

Table 21: Statistical verification

R-squared	Adjusted R-squared	p-value (F)
0,684040	0,454251	0,048550

(source: Data provided by Gretl, 2017)

According to the p-value (0.048550), the model is statistically significant. Coefficient of determination (R^2) is equal to 0.684040. It shows that changes in GDP growth are explained by changes of exogenous variables from 68%. Adjusted R^2 has usually lower value because it reflects number of predetermined variables. Value of Adjusted R^2 is in this case quite low 0.454251.

4.3.3 Econometric verification

For econometric verification of the model are used following tests: done tests: test for autocorrelation, test of heteroskedasticity, and test for normality of residuals. The level of significance is $\alpha = 0.05$.

Tests of autocorrelation

Durbin-Watson (DW) test

Mean value of DW statistics is equal 2 and finds itself in the interval $<0;4>$. Calculated value of Durbin-Watson is 2.476217. According to degrees of freedom is the lower bound equal to 0.5022, and the upper bound is equal to 2.52082. Therefore, calculated DW lies in the so called “grey zone”, and it cannot be decided whether there is an autocorrelation in the model or not. For the verification of autocorrelation is thus used Breusch-Godfrey test.

Breusch-Godfrey test

P-value of BG test is 0.249. Null hypothesis (H_0) says that there is no autocorrelation in the test. Calculated value of the BG test is higher than the level of significance $\alpha = 0.05$. Therefore, null hypothesis cannot be rejected. There is no autocorrelation in the model.

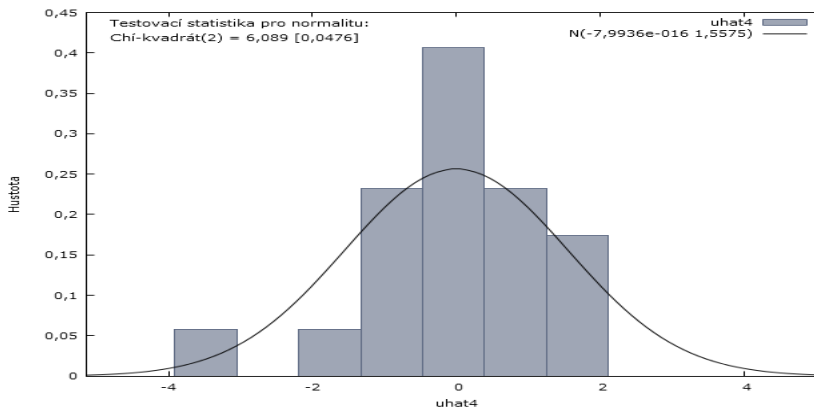
Test of heteroscedasticity

For testing of heteroscedasticity is used White test. Null hypothesis (H_0) says that there is constant covariance of residuals, which means there is homoscedasticity. Calculated p-value of White test is 0.750548, and is thus higher than level of significance $\alpha = 0.05$. Null hypothesis cannot be rejected, and the values confirm constant and finite variance.

Test for normality of residuals

For testing for normality of residuals is used Jarque-Bera test. Null hypothesis (H_0) says that there are normality of residuals in the model. Value of JB test is 0.0332499, which is lower than significance level significance $\alpha = 0.05$. Therefore, null hypothesis can be rejected, and residuals are not normally distributed. Distribution of residuals is shown in figure 27.

Figure 27: Test for Normality of Residuals



(Source: Calculation provided by Gretl, 2017)

4.4 Cointegration

As the short-term significant relationship at the level $\alpha = 0.05$ was found for explained variable y_1 (GDP growth) and explanatory variables d_{x3} (differences of exchange rate), x_9 (number of new patents), and d_{x10} (secondary education enrolment), the long-term relationship is tested by cointegration. While short-term relationship has tendency to diminish in time, in long-term relationship, time series have tendency to come back to their equilibriums states.

For testing of cointegration (long-term relationship) is used Engle – Granger test. But first, it is needed to determine, whether the variables are stationary or not. Stationarity of time series is important assumption for further testing. Null hypothesis of Dicky-Fuller test says that there is a unit root in the variable and therefore it is non-stationary. If p-value of augmented Dicky-Fuller test is lower than $\alpha = 0.05$, then null hypothesis is rejected and there is no unit root in the variable, which means variable is stationary.

First differences were used to eliminate the non-stationarity of time series, although variables d_x3, d_x5, and d_x8 remained non-stationary as their p-value is higher than $\alpha = 0.05$ after using first differences (Table 22). Therefore, they are not used for further cointegration testing.

Table 22: Augmented Dicky-Fuller test for stationarity

Variable	y1	d_x2	d_x3	x4	d_x5
p-value	0,03638	0,001626	0,07701	0,01716	0,9279
Variable	d_x6	d_x7	d_x8	d_x9	d_x10
p-value	0,0431	0,006211	0,9626	0,0001901	0,0006979

(Source: calculation provided by Gretl, 2017)

For Engle-Granger test, the null hypothesis is that there is a unit root and therefore variables are not cointegrated. The test showed p-value lower than the $\alpha = 0.05$ and thus rejection of null hypothesis for three variables. Therefore, cointegration exists between y1 (GDP growth) and d_x6 (first differences of trade balance), y1 and d_x9 (first differences of number of new patents), and y1 and d_x10 (secondary education enrolment) (Table 23).

Table 23: Engle – Granger, cointegration between y1 and exogenous variables.

Variable	d_x2	x4	d_x6	d_x7	d_x9	d_x10
p-value	0,06249	0,07309	0,04448	0,1614	0,01507	0,04321

(Source: calculation provided by Gretl, 2017)

5 Results

In year 1991, Indian government started with liberalization processes, leading to open market economy and economic growth. The aim of this thesis is to evaluate the post-liberalization growth. The trend analysis shows, that Indian GDP per capita has been growing exponentially since 1995, when GDP has increased by 67%, from 622 USD in 1995 to 1,861 USD in 2016, and India became the fastest growing G20 country. The trend analysis also shows, that GDP will continue to grow in following years, as the predicted value for year 2021 is 2,345 USD. The growth will be upheld by continuation of contemporary structural reforms. The most important are the demonetisation from 2016 and implementation of the Goods and Services Tax. After 13 years of preparations, GST unifies tax rates across all 29 Indian states and should lead to reduction of corruption, consumer tax burden, and boost of revenues and investments. India still has relatively high share of Agriculture in GDP, in 2015 the share was 17.5% compared to 8.8% in China and 1.5% in developed OECD countries. But share of agriculture has been exponentially decreasing and in 2021, the share of agriculture in GDP should be 14.75%. Share of industry in GDP has been stable since 1995, with value moving around 30% of Indian GDP. In contrary, contribution of service sector to the has been continuously increasing and in 2016 was reached 54 % of Indian GDP. Furthermore, in absolute values, share of services in GDP rose from 183 billion USD in 1995 to 1,206 billion USD in 2016.

Since the start of liberalization, the aim of Indian government was to sustain economic growth with low rate of inflation. India reached highest annual inflation rate in year 2010 with 9%. Since then inflation rate has been decreasing to 3.6% in 2016. In this thesis is analysed inflation as the wholesale price index, because it is the most closely observed indicator in India and therefore the most accurate. The trend analysis of WPI shows the constant increase in price level. As the price level in India in 2010 is considered as 100%, in 2021, predicted value of inflation should be 126% compared to 40% in 1995. As mentioned before, another important recent government measure is the demonetisation of Indian currency. In 2016, current 500 INR and 1000 INR banknotes became immediately illegal. This means that in one moment, 23 billion banknotes were demonetised, which accounted for about 10% of GDP. The main aim of demonetisation was to eliminate falsified banknotes, fight corruption and reduce tax evasion.

Unemployment in India affects millions of people. In country with half of the population below age of 27, the way how government will manage unemployment and new job opportunities may be crucial element of further economic growth. Although, the unemployment rate has been stable and relatively low, between 3,5% and 4.5%, problems with unemployment are more structural. Unemployment of women has been higher than men's unemployment. The difference was highest in 2010, when female unemployment was almost 4.5%, while male unemployment was only about 3.2%. Furthermore, there should be about 18 million people unemployed in India in 2018 according to ILO. The biggest issue is the form of employment, as the four out of five workers in developing countries work under the vulnerable forms of employment, which does not grant any security scheme. Moreover, structure of the employment by the economic sectors does not correspond to contribution of each sector to the GDP, as the most people has worked in agriculture, while it contributed least to the GDP. About half of the working population was employed in agriculture in 2010, 22% in industry, and 27% in services. Moreover, one of key challenges for India is in women's employment, as women remain tied to farm-based, low skilled, and poorly paid work much more than men. Reason for this can be found in Indian labour laws. Women in India are prevented from certain types of jobs by law and maternity benefits are not at the same level as in other countries.

India moved towards market determined exchange rates in 1993, and since then, Indian Rupee has been depreciating against the US Dollar. While in 1995, the exchange rate was 32.43, in 2016 it was already 67.2 Rupees for on USD. The forecast shows moderate growth as in 2021, the exchange rate should be 73.04 INR for one USD. India has had negative trade balance since 1995, with imports exceeding exports significantly between 2008 and 2017. India was 18th largest economy in terms of export in 2016, with value of exports equal 501 billion USD. The most important export commodities are refined petroleum, diamonds, and jewellery. The top export destinations are USA, UAE, Hong Kong and China. In case of imports, India is the 14th largest import economy in the world and imported goods and services in total value of 514 billion USD in 2016. The most important import commodities are crude petroleum, gold and diamonds, and the top countries of origin for Indian import are China, USA, and countries oil producing countries UAE and Saudi Arabia. The trend analysis shows that in following years, imports will continue to exceed exports.

After the liberalisation processes and other governmental measures, the foreign direct investment inflows have been increasing significantly. In 1995, the value of FDI inflows was about 2.1 billion USD, in 2016 it was already 44.4 billion USD which represented almost 2% of GDP. The trend analysis shows continuation of growth in the future, the estimated value of FDI inflows for year 2021 is 54.7 billion USD.

One of key elements of Indian economic development is its population. India is the second most populous country in the world after China. Trend analysis shows exponential growth. While in 1995 the population was under one billion, in 2016 the estimated population was already 1.3 billion people. The forecasted population for year 2021 is 1.40 billion people and according to UN report, India should replace China as world's number one populous country by 2022. Although, the annual growth rate has been decreasing constantly and in 2016 was about 1.1%. This corresponds to increasing standards of living as well as education. The improvement of education is in the thesis analysed via secondary school enrolment, which has been increasing steadily since 1995. In 2015, the share of pupils enrolled in secondary form of education reached 74%. In terms of urbanization, about 2.3% of population moved from countryside to major cities in 2016.

The econometric model examines the dependency of GDP growth to the macroeconomic indicators such as inflation rate, exchange rate, unemployment rate, FDI inflows, trade balance, and socio-economic indicators, such as population growth, life expectancy, number of new patents and secondary school enrolment. The interesting fact is that most of the macroeconomic indicators appeared to be statistically insignificant in the model. The most important and statistically significant variables influencing Indian GDP growth, are exchange rate, number of new patents and secondary school enrolment. Furthermore, the testing of cointegration shows that statistically significant long-term relationship can be found only between Indian GDP growth and number of new patents, which support the endogenous growth theories and importance of R&D for the economic growth of the country.

6 Conclusion

India is a country with tremendous potential. India possesses a nuclear arsenal, has the third largest army in the world, but also has own cosmic program. If well handled, its large and young population can be a driver of future economic growth.

In the framework of the thesis was found that GDP has grown steadily since the liberalization of Indian economy, and Indian government takes continuous measures and implements new policies to support the growth. As the potential game changers from the macroeconomic point of view are new Goods and Services Tax from 2017 and Demonetisation from 2016. While the new GST focuses on the uniformed tax rates all around India and therefore more effective tax collection, the Demonetisation was focused on the reduction of “black money” and focus support of non-cash transactions. Indian Rupee has steadily depreciated against USD since the 1990s, to support FDI inflows in the country. The share of FDI in GDP has been therefore increasing. Indian unemployment rate has been relatively low, and the inflation rate has been increasing steadily. The econometric model showed a statically significant relationship between GDP growth and exchange rate, and a number of new patents which represent the focus of India in R&D. Cointegration test then showed significant long-term relationship also between a number of new patents and GDP growth, which indicates overall importance of research and development for India.

Although all macroeconomic indicators show that India is on the right path, it still must deal with many obstacles. The society is still deeply stratified, the position of women in society is not as same as in the developed countries, and caste system still prevails in minds of many people. This is interconnected to the fairly low literacy rate and a large number of people living under the poverty line of 1.25 USD per day. But if India will at least partially succeed in overcoming these challenges, it can become one of the so-called global superpowers in the future.

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8 Appendix

Table 24: Indicators Data

Series Name	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Population, total (Billion)	0.96	0.98	1.00	1.02	1.03	1.05	1.07	1.09	1.11	1.13	1.14	1.16	1.18	1.20	1.21	1.23	1.25	1.26	1.28	1.29	1.31	1.32
Inflation, consumer prices (annual %)	10.22	8.98	7.16	13.23	4.67	4.01	3.68	4.39	3.81	3.77	4.25	6.15	6.37	8.35	10.88	11.99	8.86	9.31	10.91	6.65	4.91	4.94
Wholesale price index (2010 = 100)	46.3	48.4	50.6	53.6	55.4	59.1	61.9	63.5	66.9	71.3	74.7	78.2	82.1	89.2	91.3	100.0	108.9	117.7	125.1	130.0	3.5	128.9
Unemployment, total (% of total labor force)	3.97	3.95	4.39	4.12	4.22	4.31	3.78	4.32	3.93	3.89	4.40	4.33	3.72	4.15	3.91	3.55	3.54	3.62	3.57	3.53	3.49	126.4
exchange rate (to USD)	32.43	35.43	36.31	41.26	43.06	44.94	47.19	48.61	46.58	45.32	44.10	45.31	41.35	43.51	48.41	45.73	46.67	53.44	58.60	61.03	64.15	67.20
Imports of goods and services (% of GDP)	12.16	11.67	12.06	12.82	13.51	14.06	13.58	15.41	15.82	19.86	22.66	24.93	25.15	29.50	26.16	27.10	31.08	31.26	28.41	26.00	22.25	20.63
Exports of goods and services (% of GDP)	10.96	10.49	10.80	11.13	11.57	13.13	12.69	14.41	15.10	18.05	19.82	21.66	21.01	24.27	20.62	22.59	24.54	24.53	25.43	23.01	19.94	19.18
GDP growth	7.57	7.55	4.05	6.18	8.85	3.84	4.82	3.80	7.86	7.92	9.28	9.26	9.80	3.89	8.48	10.26	6.64	5.46	6.39	7.51	8.01	7.10
GDP per capita (billion constant 2010 US\$)	622	657	671	699	747	762	785	802	850	903	971	1,045	1,130	1,157	1,237	1,346	1,416	1,475	1,550	1,647	1,758	1,861
FDI, net inflows (% of GDP)	0.60	0.63	0.87	0.63	0.48	0.78	1.07	1.03	0.61	0.78	0.90	2.18	2.10	3.66	2.69	1.65	2.00	1.31	1.52	1.70	2.08	1.96
FDI, net inflows (BoP, billion current US\$)	2.14	2.43	3.58	2.63	2.17	3.58	5.13	5.21	3.68	5.43	7.27	20.03	25.23	43.41	35.6	27.4	36.5	24.0	28.2	34.6	44.0	44.5
Industry, value added (% of GDP)	32.7	31.8	31.5	30.7	30.1	31.0	30.0	31.2	31.1	33.3	33.6	34.4	34.7	33.8	33.1	32.4	32.5	31.8	30.8	30.2	29.6	28.8
Services, etc., value added (% of GDP)	40.05	40.11	41.62	42.52	44.47	45.08	46.28	47.29	47.43	46.92	46.90	46.60	46.40	47.78	48.46	48.70	48.97	50.03	50.62	51.80	52.93	53.80
Agriculture, value added (% of GDP)	27.2	28.1	26.8	26.7	25.4	23.9	23.8	21.5	21.5	19.7	19.5	19.0	18.9	18.4	18.4	18.9	18.5	18.2	18.6	18.0	17.5	17.4
Exports of goods and services (billion constant 2010 US\$)	61.4	65.3	63.8	72.6	85.7	101.2	105.6	127.9	140.1	178.2	224.7	270.4	286.4	328.2	312.9	374.2	432.5	462.0	498.0	506.8	479.9	501.5
Imports of goods and services (billion constant 2010 US\$)	76.0	74.2	84.0	101.5	108.6	113.5	116.9	130.9	149.1	182.2	241.5	293.4	323.3	396.8	388.3	448.9	543.5	576.2	529.2	533.9	502.5	514.1
Trade Balance (export:import)	-14.6	-8.9	-20.2	-28.9	-22.9	-12.3	-11.3	-3.0	-9.0	-4.0	-16.9	-23.0	-36.9	-68.5	-75.4	-74.7	-110.9	-114.2	-31.3	-27.1	-22.6	-12.5
Exports of goods and services (% of GDP)	11.0	10.5	10.8	11.1	11.6	13.1	12.7	14.4	15.1	18.0	19.8	21.7	21.0	24.3	20.6	22.6	24.5	24.5	25.4	23.0	19.9	19.2
Imports of goods and services (% of GDP)	12.2	11.7	12.1	12.8	13.5	14.1	13.6	15.4	15.8	19.9	22.7	24.9	25.2	29.5	26.2	27.1	31.1	31.3	28.4	26.0	22.3	20.6
Unemployment, total (% of total labor force)	3.97	3.95	4.39	4.12	4.22	4.31	3.78	4.32	3.93	3.89	4.40	4.33	3.72	4.15	3.91	3.55	3.54	3.62	3.57	3.53	3.49	3.46
Unemployment, female (% of female labor force)	4.10	4.07	4.33	4.86	4.20	4.22	3.88	4.44	3.95	3.92	5.01	4.90	3.80	4.33	3.86	4.42	4.34	4.24	4.18	4.00	3.89	3.81
Unemployment, male (% of male labor force)	3.92	3.90	4.41	3.83	4.22	4.35	3.73	4.26	3.92	3.88	4.14	4.10	3.69	4.09	3.92	3.26	3.27	3.43	3.38	3.38	3.36	3.34

(Source: Data provided by World Bank, 2017)

Table 25: Matrix X and Vector y

X1	X2	D_X3	X4	D_X5	X6	X7	D_X8	X9	D_X10	Y1
1	8.98	3.00	3.95	-0.02	-8.89	0.63	0.47	1.66	-0.06	7.55
1	7.16	0.88	4.39	-0.03	-20.20	0.87	0.45	1.93	0.55	4.05
1	13.23	4.95	4.12	-0.03	-28.85	0.63	0.44	2.25	-1.88	6.18
1	4.67	1.80	4.22	-0.03	-22.88	0.48	0.41	2.21	-0.93	8.85
1	4.01	1.88	4.31	-0.04	-12.30	0.78	0.40	2.21	1.84	3.84
1	3.68	2.25	3.78	-0.04	-11.28	1.07	0.40	2.38	0.28	4.82
1	4.39	1.42	4.32	-0.03	-3.04	1.03	0.38	2.69	1.93	3.80
1	3.81	-2.03	3.93	-0.04	-8.96	0.61	0.39	3.43	2.55	7.86
1	3.77	-1.26	3.89	-0.04	-3.97	0.78	0.40	4.01	1.75	7.92
1	4.25	-1.22	4.40	-0.04	-16.87	0.90	0.40	4.72	2.60	9.28
1	6.15	1.21	4.33	-0.03	-23.02	2.18	0.41	5.69	0.91	9.26
1	6.37	-3.96	3.72	-0.04	-36.91	2.10	0.42	6.30	2.40	9.80
1	8.35	2.16	4.15	-0.04	-68.54	3.66	0.42	6.43	3.08	3.89
1	10.88	4.90	3.91	-0.05	-75.44	2.69	0.42	7.26	-0.77	8.48
1	11.99	-2.68	3.55	-0.05	-74.68	1.65	0.41	8.85	3.50	10.26
1	8.86	0.94	3.54	-0.06	-110.93	2.00	0.39	8.84	3.13	6.64
1	9.31	6.77	3.62	-0.05	-114.22	1.31	0.37	9.55	2.74	5.46
1	10.91	5.16	3.57	-0.04	-31.29	1.52	0.34	10.67	-0.26	6.39
1	6.65	2.43	3.53	-0.03	-27.05	1.70	0.31	12.04	5.38	7.51
1	4.91	3.12	3.49	-0.02	-22.58	2.08	0.28	12.58	-0.31	8.01

(Source: Own calculation)