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Economic Dynamics in Turkey in Public Data View

Master's Thesis

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Declaration

I declare I wrote the Master's thesis "Economic Dynamics in Turkey in Public Data View" myself, using only the listed bibliography.

The research was done under the support and guidance of prof. RNDr. Hana Skalská, CSC.
In Hradec Králové.

Date: 27.07.2019

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Annotation

This master's thesis, which is named "Economic Dynamics in Turkey in Public Data View", maps the changes of important macroeconomic indicators of Turkey within the time and uses the analysis of times series data with the aim to formally describe their development with the goal to find mutual associations and explain them in the context of Turkey society conditions. Quantitative methods are applied in order to reach the main aim of the research.

Various sources of data with different time intervals are used to get the economic indicators measured in time series. In order to make them comparable, the research is focused on the latest Government period of Turkey between years 2002 and 2018.

Keywords: economic indicators, GDP (Gross Domestic Product), inflation, interest rate, unemployment, exchange, rates, balance of trade, credit rating agencies, emerging markets, developing countries, OECD, data, statistics, time series

Anotace

Tato magisterská práce, nazvaná „Ekonomická dynamika v Turecku z pohledu veřejných dat", mapuje změny důležitých makroekonomických indikátorů Turecka v čase a využívá analýzu časových sérií dat se záměrem formálně popsat jejich vývoj, najít vzájemné spojitosti, a vysvětlit je v kontextu společenské situace v Turecku. Pro dosažení hlavního cíle této práce bylo využito kvantitativních metod. Různorodé zdroje dat s různými časovými intervaly jsou využity pro získání ekonomických indikátorů měřených v časových řadách. Z důvodu porovnatelnosti použitých dat se výzkum zaměřuje na období posledních vlád v Turecku v období mezi roky 2002 a 2018.

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1. Introduction

There is no moment when human being takes an action without making a decision. In our daily routines; in business, social, and personal life there are always several options to pick.

Making a decision is a crucial activity and responsibility that would affect both decision maker and stakeholders. Statistics is a golden science that serves for viewing and analysing any indicator via its time series data. It is necessary to use the correct data and analyse them with a proper statistical method. Decision maker would monitor the output and be able to forecast what is coming next with the observed data.

Statistics is used in several fields such as economy, finance, politics, history, medicals etc. in order to improve quality and efficiency. It also helps to understand the meaning of the past and current data.

This research is focused on description and analysis of the main economic dynamics of Turkey, which are explained, analysed and monitored via the most important indicators such as GDP (Gross Domestic Product), inflation rates, interest rates, exchange rates, unemployment rates and balance of trade; with their statistical data. Also the relation and correlation between the indicators are touched on briefly.

OECD and OECD countries, European Union and its members, emerging markets and developing countries, credit rating agencies and their scale are defined and compared on the base of analysis of time series data.

The most referenced statistical institutions such as OECD Data, EuroStat and TurkStat are described.

2. Objectives and Methodology

2.1. Objectives

The aim of the study is to map the economic view of Turkey with the selected indicators.

In order to achieve this aim, the set of objectives is defined below:

- to determine the main economic indicators of Turkey
- to describe and explain the selected economic indicators
- to describe time series data method
- to analyse selected economic indicators via time series data method

Time series can be very useful to understand the past and current situation of any data. This thesis emphasizes the importance of **presenting data in charts** in order to understand and analyse the time series data better.

2.1.1. Research Questions

RQ1: Which statistical institutions follow up the economic data of Turkey?

RQ2: What is the economic view of Turkey based on the main economic indicators?

RQ3: What are the Credit Rating Agencies and the economic grade of Turkey?

RQ4: Is there any relation between the economic indicators?

RQ5: Are there any unobserved factors that affect the economy?

2.2. Methods

The structure of study includes 2 main parts, such as theoretical and practical. Consecutively, the theoretical part is also dived into two parts: economical and statistical, which acquaint the reader with the basic concepts and definitions, used in the practical part of the research. Moreover, the statistical part of the theory provides a number of mathematical and statistical methods applied in practical part.

Quantitative methods are applied in order to reach the aim via the times series data technique. This technique was chosen as the most reliable one that able to measure both historical and current data, have been recorded throughout years and reflecting the state of the economy of Turkey in the given period via macroeconomic indicators.

Though rare, approaches of the opinion leaders are also taken into account in reaching the conclusion.

3. Theoretical Part

3.1. Economical Part

Dynamic stands for ***"continuously changes or developing"*** according to Cambridge dictionary ***(Cambridge University Press, 2019).*** Economic dynamics refers the economic development of the countries based on the main macroeconomic indicators. Here in the theoretical part; the main economic indicators that creates the dynamics of Turkey, statistical institutions and also some other related titles are explained.

3.1.1. Economic Growth

Paul Michael Romer (co-recipient of the 2018 Nobel Memorial Prize in Economic Sciences) has proposed a metaphorical definition of economic growth related to kitchen:

"To create valuable final products, we mix inexpensive ingredients together according to a recipe. The cooking one can do is limited by the supply of ingredients, and most cooking in the economy produces undesirable side effects. If economic growth could be achieved only by doing more and more of the same kind of cooking, we would eventually run out of raw materials and suffer from unacceptable levels of pollution and nuisance. Human history teaches us, however, that economic growth springs from better recipes, not just from more cooking. New recipes generally produce fewer unpleasant side effects and generate more economic value per unit of raw material". (Romer, 2016)

Basically, Paul Romer states that the "recipe" of economic growth is to use a different kind of sources efficiently in a well-organized way.

According to Cambridge Dictionary, economic growth is defined as increasing the value of goods and services in a country or region and at the same time keeping the inflation low and encouraging savings and investments. ***(Cambridge University Press, 2019)***

Economic growth brings several benefits, but also some costs. Companies and workers get relatively high incomes. Governments receive higher taxes in line with the growth and this increases the public investments. Increased tax revenues help to reduce budget deficit. New business areas provide new job opportunities and decrease unemployment rates. On the other hand, fast growth may increase the inflation. Prosperous society may tend to buy imported products which causes foreign trade deficit. Higher resource consumption causes pollution. ***(Pettinger, 2017)***

3.1.2. Organization for Economic Cooperation and Development (OECD)

Organization for Economic Cooperation and Development (OECD) is an international economic organization founded in 1961. OECD provides a forum to the governments of 36 countries to work together, discuss the problems and find solutions.

Table 1: OECD Countries

Country	Membership	Country	Membership	Country	Membership
Australia	1971	Hungary	1996	New Zealand	1973
Austria	1961	Iceland	1961	Norway	1961
Belgium	1961	Ireland	1961	Poland	1996
Canada	1961	Israel	2010	Portugal	1961
Chile	2010	Italy	1962	Slovakia	2000
Czech Republic	1995	Japan	1964	Slovenia	2010
Denmark	1961	South Korea	1996	Spain	1961
Estonia	2010	Latvia	2016	Sweden	1961
Finland	1969	Lithuania	2018	Switzerland	1961
France	1961	Luxembourg	1961	Turkey	1961
Germany	1961	Mexico	1994	United Kingdom	1961
Greece	1961	Netherlands	1961	United States	1961

(OECD, 2019)

Main aims of the organization are as follows:

- Improving the living standards of the people in the member states, but especially developing countries with no financial stability;

- Supporting and assisting to the policy which ensures continuous and balanced economic development;

- Eliminating unemployment;

- Promoting economic expansion policy and supporting socio-economic development;

- Supporting the development of international trade between countries in accordance with international obligations;

- Improving democracy and human rights. ***(OECD, 2019)***

OECD Data

OECD Data provides access to hundreds of statistical series of eBooks and working papers from the 1960s to present via OECD.Stat, OECD iLibrary and OECD Key Tables platforms.

OECD Data is one of the world's largest and most reliable sources of comparable statistical, economic and social data.

Main economic indicators of OECD statistics include:

- International trade and commodities
- Education, science, technology and R&D
- Labour markets
- International direct investment / FDI
- National accounts
- Health
- Taxation
- Social expenditure
- Productivity
- Agriculture
- Pensions
- Globalisation indicators
- Telecommunications

(OECD, 2013)

3.1.3. European Union and Euro Zone (Euro Area)

European Union is an economic and political organization with its 28 members. It has standardized system of laws provides the same rights to all citizenships of the member countries. European Union polices ensures free movement of people, goods and services within the union borders.

It has been founded as "European Coal and Steel Community" in 1952 between 6 countries which are Belgium, France, (West) Germany, Italy, Luxembourg and the Netherlands. 1 January 1973, there was the first enlargement with the joining of Denmark, Ireland and the United Kingdom.

Table 2: European Union Members and Currencies

Country	Currency	EU Accession Date	Country	Currency	EU Accession Date
Belgium	EUR	25.03.1957	Sweden	SEK	01.01.1995
France	EUR	25.03.1957	Cyprus	EUR	01.05.2004
Germany	EUR	25.03.1957	Czech Republic	CZK	01.05.2004
Italy	EUR	25.03.1957	Estonia	EUR	01.05.2004
Luxembourg	EUR	25.03.1957	Hungary	HUF	01.05.2004
Netherlands	EUR	25.03.1957	Latvia	EUR	01.05.2004
Denmark	DKK	01.01.1973	Lithuania	EUR	01.05.2004
Ireland	EUR	01.01.1973	Malta	EUR	01.05.2004
United Kingdom	GBP	01.01.1973	Poland	PLN	01.05.2004
Greece	EUR	01.01.1981	Slovakia	EUR	01.05.2004
Portugal	EUR	01.01.1986	Slovenia	EUR	01.05.2004
Spain	EUR	01.01.1986	Bulgaria	LEV	01.01.2007
Austria	EUR	01.01.1995	Romania	RON	01.01.2007
Finland	EUR	01.01.1995	Croatia	EUR	01.07.2013

(European Union, 2019)

Table 2 gives the information about the accession dates of the member countries. Croatia is the last country that joined European Union in 2013.

Eurozone, with the official name Euro Area, is a monetary union between 19 countries of European Union. These countries left their currencies and adopted Euro. There are also non-European countries which have special agreements to use Euro as official currency such as Andorra, Monaco, San Marino, and Vatican City. Kosovo and Montenegro have accepted Euro as official currency as well but they have no representations in European Central Bank.

Although Iceland, Liechtenstein, Norway and Switzerland are not in European Union; they are strongly connected with European Economic Area. These countries are under European Free Trade Association (EFTA) and operates economic activities together with European Union.

Albania, the Republic of North Macedonia, Montenegro, Serbia and Turkey are EU candidate countries and following EU legislations and standards according to EU enlargement policy. ***(European Union, 2019)***

The goals of European Union are announced ***(European Union, 2019)*** as below:

“ - Promote peace, its values and the well-being of its citizens

- ***Offer freedom, security and justice without internal borders***
- ***Sustainable development based on balanced economic growth and price stability, a highly competitive market economy with full employment and social progress, and environmental protection***
- ***Combat social exclusion and discrimination***
- ***Promote scientific and technological progress***
- ***Enhance economic, social and territorial cohesion and solidarity among EU countries***
- ***Respect its rich cultural and linguistic diversity***
- ***Establish an economic and monetary union whose currency is the euro. ”***

European Union give importance to the values such as “human dignity, freedom, democracy, equality and human right”. Law and justice are decided by countries judicially but European Court of Justice has the right to give “the last word”. ***(European Union, 2019)***

EuroStat

European Statistical Office (EuroStat) provides statistical information to institutions of European Union. Not only for EU member countries but also analyse and publish the data for EFTA and EU candidate countries. Eurostat does not collect the data itself but keeps the data by the authorities of the states. Eurostat describes set of the activities in different sectors as below:

“ - Resources

- ***Methodology, Dissemination, Cooperation in the European Statistical System***
- ***Macro-economic statistics***
- ***Government finance statistics (GFS) and quality***
- ***Sectoral and regional statistics***
- ***Social statistics***
- ***Business and trade statistics ” (EuroStat, 2019)***

TurkStat (Turkish Statistical Institute)

Turkish Statistical Institute is a government organization founded in 1926 in order to collect data of population, resources, economy, society, and culture in Turkey.

The mission of TurkStat is:

- Preparing the official statistical researches and controlling the compliance of statistics with international statistical institutions and organizations
- Determining the statistical definitions and classifications in cooperation with relevant national and international institutions and organizations
- Following the updated scientific methods and information technologies in the field of statistics, cooperating with other countries and international organizations in order to coordinate the establishment of national and international information network.
- Evaluating, analysing and publishing statistical information of economic, social, demographic, cultural, environmental, scientific and technological fields; and also making scientific and technical description of the results of official statistics.

(TurkStat, Turkish Statistical Institue, 2019)

3.1.4. Emerging Markets

It is essential to revise what "developing countries" are in order to explain the phenomenon of emerging markets. Developing countries have some features of developed countries. However they are industrially less evolved with a lower human development index (HDI) compared to industrialized countries. ***(Wikipedia, 2019).*** We consider economies of developing countries, emerging markets.

Emerging markets have similar characteristics amongst themselves. The level of **per capita income** of developing countries are **low to middle** compared to developed countries. Moreover, developing countries are willing to industrialize rapidly. Therefore, higher growth rates can be monitored on developing countries more than the developed countries. Nevertheless, despite their attempts to reach higher scale of industrialization, the volume of industrial production in these countries is still lower compared to developed countries.

Immature capital markets, because of the lack of information, makes it **risky** for foreign investors to fund into developing countries. By the reason of higher socio-political instability and volatility, emerging markets are considered to be **fragile economies**.

The report of S&P Dow Jones Indices, published on June 13, 2018, includes 23 emerging markets which are listed with their GDP weights in total GDP below:

Table 3: Emerging Markets (by S&P Global, 2018)

No	Country	Weight	No	Country	Weight	No	Country	Weight
1	Brazil	7,05%	9	India	12,78%	17	Qatar	0,62%
2	Chile	1,46%	10	Indonesia	2,37%	18	Russia	4,20%
3	China	34,95%	11	Malaysia	2,87%	19	South Africa	7,03%
4	Colombia	0,60%	12	Mexico	2,88%	20	Thaiwan	13,93%
5	Czech Republic	0,18%	13	Pakistan	0,26%	21	Thailand	3,06%
6	Egypt	0,24%	14	Peru	0,45%	22	Turkey	0,99%
7	Greece	0,44%	15	Philippines	1,36%	23	UAE	0,74%
8	Hungary	0,27%	16	Poland	1,27%	**Total**		**100,00%**

(S&P Global, 2018)

3.1.5. Credit Rating Agencies (The Big Three)

Credit rating agencies measure whether a company or a country can fulfil its financial obligations on time or not. Basically, they evaluate the companies and countries according to their financial system and inform global investors with true analysed data and information. Those evaluations have crucial role in the financial and economic activities of countries and companies in order to attract investors. ***(FinansPara, 2018)***

There are 3 major U.S. based companies (The Big Three) controlling 95% of all the market:

- Standard & Poor's (S&P)
- Moody's
- Fitch

(Council on Foreign Relations (CFR), 2019)

According to BillionTrader, following rating categories are used:

Table 4: Grade Scale of the Big Three (redesigned according to long term grades by author)

<table>
<tr><th>Moody's</th><th>S&P</th><th>Fitch</th><th colspan="2">Description</th></tr>
<tr><td>Aaa</td><td>AAA</td><td>AAA</td><td>Prime</td><td rowspan="10">Investment Grade</td></tr>
<tr><td>Aa1</td><td>AA+</td><td>AA+</td><td rowspan="3">High Grade</td></tr>
<tr><td>Aa2</td><td>AA+</td><td>AA</td></tr>
<tr><td>Aa3</td><td>AA-</td><td>AA-</td></tr>
<tr><td>A1</td><td>A+</td><td>A+</td><td rowspan="3">Upper Medium Grade</td></tr>
<tr><td>A2</td><td>A</td><td>A</td></tr>
<tr><td>A3</td><td>A-</td><td>A-</td></tr>
<tr><td>Baa1</td><td>BBB+</td><td>BBB+</td><td rowspan="3">Lower Medium Grade</td></tr>
<tr><td>Baa2</td><td>BBB</td><td>BBB</td></tr>
<tr><td>Baa3</td><td>BBB-</td><td>BBB-</td></tr>
<tr><td>Ba1</td><td>BB+</td><td>BB+</td><td rowspan="3">Speculative</td><td rowspan="14">Non-Investment Grade</td></tr>
<tr><td>Ba2</td><td>BB</td><td>BB</td></tr>
<tr><td>Ba3</td><td>BB-</td><td>BB-</td></tr>
<tr><td>B1</td><td>B+</td><td>B+</td><td rowspan="3">Highly Speculative</td></tr>
<tr><td>B2</td><td>B</td><td>B</td></tr>
<tr><td>B3</td><td>B-</td><td>B-</td></tr>
<tr><td>Caa1</td><td>CCC+</td><td>CCC</td><td>Substantial Risks</td></tr>
<tr><td>Caa2</td><td>CCC</td><td>/</td><td>Extremely Speculative</td></tr>
<tr><td>Caa3</td><td>CCC-</td><td>/</td><td>Default Imminent with Little</td></tr>
<tr><td rowspan="2">Ca</td><td>CC</td><td>/</td><td rowspan="2">Prospect for Recovery</td></tr>
<tr><td>C</td><td>/</td></tr>
<tr><td>C</td><td rowspan="3">D</td><td>DDD</td><td rowspan="3">In Default</td></tr>
<tr><td rowspan="2">D</td><td>DD</td></tr>
<tr><td>D</td></tr>
</table>

(BillionTrader, 2015)

Each agency has their own standards and scales to evaluate company or countries. In each of the three institutions, the highest grades are expressed as AAA, and later levels are symbolized as AA1 or AA+. When evaluating countries and companies, the lowest investment levels given are BBB- and Baa3. If the score is below BBB- and Baa3, they are put in non-investment categories. In these grades, investments are quite risky and the markets are speculative. These markets try to reach at least the lowest level of investment grade to attract foreign investors. ***(The Council on Foreign Relations, 2015)***

3.1.6. Selected Economic Indicators

Gross Domestic Product (GDP)

The modern concept of GDP was announced by Simon Kuznets - the chief architect of the United States national accounting system - in the report of US Congress, in 1934. Kuznets developed the first complex set of calculations of national income. ***(Wikipedia, 2019)***

GNP (gross national product) commonly used from World War II until 1990s and then it has been replaced by GDP. Philipp Lepenies points out that "GDP is the most powerful statistical figure in human history" and explains it as a value of the total domestic economic output of a country's economy in a specific time. ***(Lepenies, 2016)***

It is necessary to have a more detailed look on the definition word by word. "Gross" states that ***"no deduction has been made for the depreciation of machinery, buildings and other capital products used in production".*** "Domestic" signifies that ***"it is production should be performed by the resident institutional units of the country"***. The "product" refers to ***"final goods and services, those that are purchased, imputed or otherwise, as: the final consumption of households, non-profit institutions serving households and government; fixed assets; and exports (minus imports)". (Glance, 2009)***

GDP is mostly used synonymously with national well-being. Robert Costanza, Maureen Hart, Stephen Posner and John Talberth from Boston University criticize this approach. According to them, one cannot easily say there is a parallelism with welfare, unless GDP fulfils the goals of society - not only economic parameters, but also social needs such as freedom and others. ***(Costanza, Hart, Posner, & Talberth, 2009)***

Prateek Agarwal explains the factors which affect economic growth as "natural resources, physical capital or infrastructure, population or labour, human capital, technology and law". Agarwal also lists the factors that limit the economic growth, which are "poor health and low levels of education, lack of necessary infrastructure, flight of capital, political instability, institutional framework, the world trade organization". ***(Intelligent Economist, 2019)***

GDP per capita or per capita income represents GDP per person; in other words, dividing total GDP value to total population. Per capita income is an important indicator to measure the economic performance of a country and compare with the others. However, it is a direct average calculation which does not show the real distribution of GDP among people fairly. ***(Economics, 2019)***

Policy Interest Rate

The most common definition of interest is the price paid for the use of money. It is the price borrowers need to pay moneylenders for its future value. ***(Campbell R. McConnell, 2017)***

Risk is the crucial factor for the interest rates to set. If the moneylender believes that the borrower has a high risk financially, the borrower would be charged with a high interest rates. ***(Investopedia, 2019)***

Policy interest rate is an interest rate set by monetary authorities (central banks) to regulate main monetary dynamics such as consumer prices, exchange rates etc. Each country has different policies to set their interest rates according to their economic situation. The most common policy interest rate instruments are **overnight lending rate, discount rate** and **repurchase rate**. Authorities increase policy interest rates in order to curb high inflation, currency depreciation, excessive credit growth or capital outflows. Conversely, decreasing interest rate would be aimed at boosting economic activity by fostering credit expansion or currency depreciation in order to gain competitiveness. ***(Focus Economics, 2018)***

Central Bank of Turkey considers overnight interest rate and 1 week repo. According to the definition of Bank of Canada, **"*the overnight interest rate is the interest rate at which major financial institutions borrow and lend one-day (or "overnight") funds among themselves; the Bank sets a target level for that rate*" *(Bank of Canada, 2019)***. Repo (repurchase agreement) rate stands for the rate that central banks lends money to commercial banks for short term ***(The Economic Times, 2019).***

Inflation Rate

Inflation is the persistent increase of general level of prices. If there is high inflation; consumers, with the same amount of money, are able to buy less goods and services comparing to previous periods. In other words, it represents the situation when PPP (Purchasing Power Parity) goes down. Inflation does not have to be affected by the price increase of all the goods and services. Some of them could stay on the same level but the others may rise up. ***(Campbell R. McConnell, 2017)***

There are several ways to measure inflation rates. The calculation methods will be explained in the statistical part of my paper. The most common way to measure inflation rate is via Consumer Price Index (CPI). CPI is an index that measures the prices of a fixed "market basket" of some goods and services each month and year. ***(Campbell R. McConnell, 2017)***

Producer Price Index (PPI) is also a measurement of inflation at the wholesale, or producer level. The PPI measures the average changes over time in the selling prices received by domestic producers. ***(Majaski, 2019)***

There is another way to measure inflation rate by GDP price index that has more complicated calculations. GDP price index includes not only consumer goods and services, but also capital goods, goods and services purchased by government, and goods and services that enter world trade. ***(Campbell R. McConnell, 2017)***

Inflation can be examined into two categories on the basis of **rate** and **cause.**

According to the basis of rate, 3 groups can be distinguished:

- Moderate Inflation (also known as Creeping Inflation) stands for a single digit (less than 10%) annual inflation rate.
- Galloping Inflation: In this type of inflation, annual price increases reach two or even three-digits.
- Hyper Inflation refers extremely high rate. The annual price increase is above %1000. In this period, the currency of the country loses its value constantly and people prefer to invest their money into gold, silver or foreign currencies. ***(Business Jargons, 2019)***

Then, inflation on the basis of cause can be divided into 2 types:

- Demand-pull Inflation: This situation occurs when the demand is over than the production capacity of the country (demand). In other words, when the demand doesn't reach the supply, prices rise up.
- Cost-push Inflation: Another kind of inflation caused by the supply side. When the costs rise up, it affects the price of the goods upwards. ***(Campbell R. McConnell, 2017)***

Economists often point out the relation between interest rates and inflation and more common approach is that interest rates affect inflation rates. This effect can be negative or positive, which depends on the type of inflation. While the interest rate has decreasing effect on demand-pull inflation, it has increasing effect on cost push inflation.

Exchange Rate

The basic definition of an exchange rate is the value of one country's currency in relation to another currency. ***(Arthur O'Sullivan, 2003)***

It is wise to start to explain the need for exchange markets in connection with foreign trade. Each country has its own currency that helps people to make domestic and daily trades. The difference between domestic and international trade is the involvement of different national currencies. ***(Campbell R. McConnell, 2017)***

Exchange rate system is mainly divided into 2 groups, such as flexible or floating exchange rate system and fixed exchange rate system.

- Flexible, or Floating Exchange Rate System: In this system, the government has no effect on the exchange rates. The exchange rate is determined by the natural result of the supply and demand balance.
- Fixed Exchange Rate System: The government is authorized to set the exchange rate. ***(Campbell R. McConnell, 2017)***

Both flexible and fixed exchange rate system has some advantages and disadvantages, which are presented in the table below:

Table 5: Fixed versus Flexible Exchange Regimes

	Flexible Exchange Rate System		Fixed Exchange Rate System
Advantages	- Exchange rates adjusts to shocks and imbalances - Less vulnerable to speculative attacks - Monetary policy effective - No need to raise interest rates or a cause recession to defend the ER	**Disadvantages**	- Difficult to adjust to imbalances - Vulnerable to speculative attacks - Monetary policy ineffective - May need to raise interest rates or cause recession to defend the exchange rate.
Disadvantages	- Volatile exchange rates and prices -> uncertain future - Harder to control or reduce inflation	**Advantages**	-Stable exchange rates -> facilitates Trade and Investment - Credibility to fight inflation and reform

(McCoy, 2015)

If the demand of the local currency rises up, the local currency appreciates, and if the demand goes down that currency depreciates. Similarly, while the supply of the local currency goes up, the local currency depreciates and otherwise it appreciates. Besides, technically, while one currency appreciates, the other one depreciates relative to it. ***(Campbell R. McConnell, 2017)***

Currently, the accepted international exchange system is called "managed floating exchange rate system". This system is quite similar to flexible exchange rate system with the difference in some interventions of countries made to stabilize exchange rates. ***(Campbell R. McConnell, 2017)***

Balance of Trade

Before explaining the balance of trade, it is important to understand the components of international trade that are "export" and "import". Kimberly Amadeo defines export as the goods and services produced in a country and bought by the people of another country. Amadeo also explains import; the goods and services purchased by a country's residents that are produced in a foreign country. The equilibrium between export and import makes up the balance of trade. ***(Amadeo, Exports and Their Effect on the Economy, 2019)***

Tourism is widely accepted as an export trade since overall product and services are bought in a country by visitors. ***(International Trade Center, 2017)***

If a country has more imports than its exports, it causes a trade deficit. In the same way, if a country imports less than exports, that creates a trade surplus. Trade deficit is not a desired condition, because it means that the country's products and services are not attracted by foreign markets could create recession in the economy with causing less production and unemployment. This result may increase the imports and enlarge the gap the difference between export and import negatively. ***(Rama-Poccia, 2018)***

Governments try to avoid trade deficit. Amadeo explains how to avoid trade deficit in 4 ways:

- Increasing taxes for import goods. Import goods would get higher prices which affects people bear not to buy those products. However, this way would not be welcomed by other countries and would possibly cause retaliation.
- Subvention to domestic companies. Government supports companies to protect domestic production. In this way, companies lower the costs and in connection with this the prices of the products decrease. People prefer to buy domestic products than import goods with the advantage of lower prices.
- Developing bilateral, regional or global trade agreements between countries have an effect to increase exports.
- Devaluation of local currency. This has augmentative effect on exports. Since the local currency loses its value against other currencies, the prices of the goods become lower and more competitive than other countries' products.

  (Amadeo, Imports and How They Affect the Economy, 2019)

Unemployment Rate

According to the International Labour Organization (ILO), unemployment rate is a measure of inability of an economy to create employment for people who do not work but actually available to work and look for job actively. Unemployment rate shows the efficiency and effectiveness of an economy to absorb its labour force. ***(International Labour Organization (ILO), 2019)***

There are three types of unemployment:

- **Frictional Unemployment:** This type of unemployment is actually a temporary unemployment. People who are fired or find a new job has mostly that gap period. They normally have a job but because of some reasons they change their job. Meanwhile, for mostly short term, these people are temporarily unemployed. However, they are able to find a job easily.
- **Structural Unemployment:** Changes in consumer demand and technology over time affect the structure of total labour demand. Technology alteration and automation affect the demand of labour and may cause some jobs to disappear.

  While frictionally unemployed workers have saleable skills and good educational background, structurally unemployed workers need additional trainings and relocation to find a job. Also, unlike frictional unemployment, structural unemployment has a long term period.
- **Cyclical Unemployment:** Unemployment that is caused by a decrease in absolute spending is called cyclical unemployment and regularly starts in the recession period of the business cycle. Due to lack of demand of goods and services during recession period, there would be no need in many employees and the unemployment rate would rise up.

  (Campbell R. McConnell, 2017)

There is also another kind of unemployment called "Seasonal Unemployment" which, as it its name suggests, stands for some seasonal jobs. Tourism and agricultural sectors might be the examples of this kind of unemployment.

Zero unemployment rate is not really realistic and practical. That is the reason we consider "natural unemployment rate" as an "accepted" unemployment rate. FED (Federal Reserve) estimates it between 4.5% and 5%. Natural unemployment rate can be described as the mix of frictional, structural, and surplus unemployment (occurs when the government intervenes with minimum wage laws or wage/price controls). ***(Amadeo, Natural Rate of Unemployment, Its Components, and Recent Trends, 2019)***

3.2. Mathematical and Statistical Part

3.2.1. Average Annual Growth Rate

In order to measure average annual growth rate over time series, we simply use Average Annual Growth Rate (AAGR) calculation.

AAGR is a way to measure the average growth rate in long term trends. The periods should be always used throughout equal periods of time such as weeks, months or years.

Equation 1: AAGR Formula

$$AAGR = \frac{GR_A + GR_B + \cdots + GR_n}{N}$$

Where:

GR_A = Growth rate in period A

GR_B = Growth rate in period B

GR_n = Growth rate in period n

N = Number of all periods

(Hayes, 2019)

3.2.2. Index Numbers

Index numbers is a technique of measuring changes in the general level of prices over a period of time. In order to analyse time series, we need one value measured at one point in time to compare other values which are measured in different periods of time. At this point, we require a **base period index** to compare all the data values fairly. Base period of the index number is set as 100.

Equation 2: The Simple Index Number

$$I_t = \frac{y_t}{y_0}.100$$

Where:

I_t = Index number at time period *t*

y_t = Value of the time series at time *t*

y_0 = Value of the time series at the index base period

(Groebner, Shannon, Fry, & Smith, 2007)

Paasche Index

The amounts of the current year are used as the weighting factor. Therefore, the amounts of the current year are included in both the denominator and numerator.

Equation 3: Paasche Index

$$I_t = \frac{\sum q_t p_t}{\sum q_t p_0}.(100)$$

Where:

q_t = Weighting percentage at time *t*

p_t = Price in time period *t*

p_0 = Price in the base period

(Groebner, Shannon, Fry, & Smith, 2007)

Laspeyres Index

It is similar to Paasche Index, but includes the crucial difference: instead of considering current period's weights, Laspeyres Index uses base period's weights.

Equation 4: Laspeyres Index

$$I_t = \frac{\sum q_0 p_t}{\sum q_0 p_0} =.(100)$$

Where:

q_0 = Weighting percentage at base period

p_t = Price in time period *t*

p_0 = Price in the base period

We use Laspeyres Index while calculating inflation rates with Consumer Price Index or Producer Price Index.

(Groebner, Shannon, Fry, & Smith, 2007)

3.2.3. GDP Deflator

The nominal GDP is sum of the final product and services of a country in a year. The real GDP takes into account inflation and gives accurate outcome.

GDP Deflator is a calculation technique of price inflation or deflation with the respect of base year and also used in order to convert nominal GDP to real GDP.

Equation 5: GDP Deflator

$$\text{GDP Deflator} = \frac{Nominal\ GDP}{Real\ GDP}\ x\ 100$$

(LumenLearning, 2019)

3.2.4. Time Series

Time series data is the data of the previous periods that have been measured over time. The forecaster must analyse the relevant time series to predict them more accurate.

Time series plot is crucial in determining time series components. All time series data have characteristics of one these components:

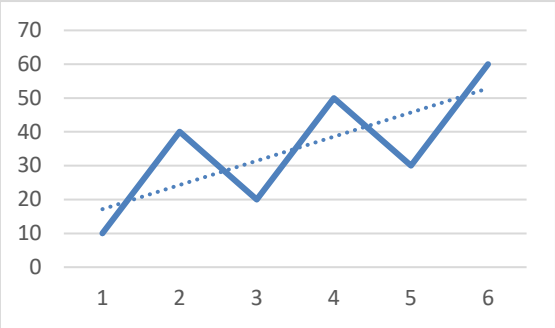
- Trend Component
- Seasonal Component
- Cyclical Component
- Random Component

(Groebner, Shannon, Fry, & Smith, 2007)

Trend Component

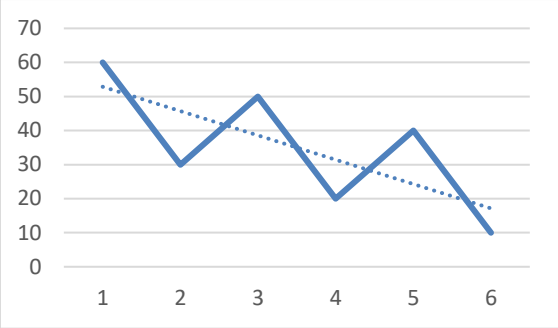
The trend is the long term increase or decrease of a time series. Trend can be positive and show an upward trend; or negative, demonstrating a downward trend throughout the given period of time.

Figure 1: Example of Upward Linear Trend



(Source: Author)

Figure 2: Example of Downward Linear Trend

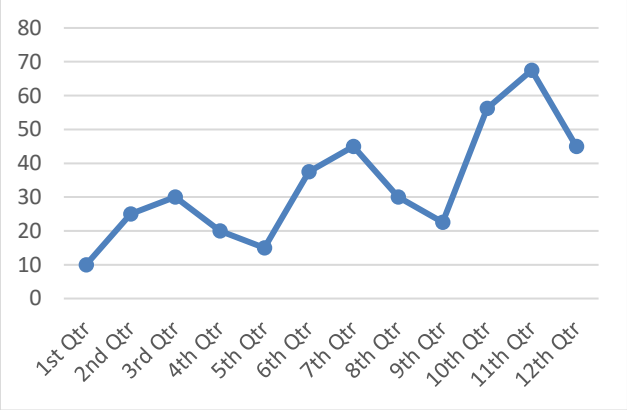


(Source: Author)

If the increase or decrease rate of the change is relatively constant, then the trend is linear and is called a linear-trend. The trend can also be parabolic when the rate of change is not constant which is called a non-linear trend. The trend can be measured over years, months or days, unlikely seasonal component. ***(Groebner, Shannon, Fry, & Smith, 2007)***

Seasonal Component

Figure 3: Example of Seasonal Component



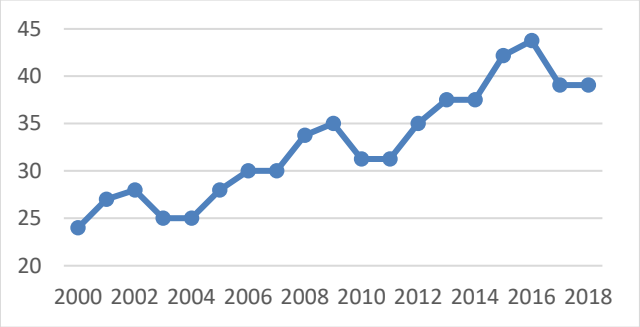
(***Source: Author)***

Seasonal Component is another component of time series. Time series reflects repetitive behaviour. Repetition period might be long or short term. Recurrence period occurs when the shortest period of a repetition of a pattern. For seasonal component recurrence period can be maximum one year. The data can be measured semi-annually, quarterly, monthly or daily. When the repetitious pattern with a recurrence period is longer than one year we cannot talk about seasonal component but cyclical component that will be explained in the next title.

Figure 3 can be an example of a seasonal component. Similar behaviour would be expected previous or following years quarterly. ***(Groebner, Shannon, Fry, & Smith, 2007)***

Cyclical Component

Figure 4: Example of Cyclical Component



(***Source: Author)***

Cyclical component is alike to seasonal component but recurrence period is longer than one year and similarly wave-like pattern throughout the time series. National economic indicators such as unemployment rates, GDP etc. may show cyclical behaviour. In order to analyse cyclical component, we require longer time data to monitor it clearly.

Cyclical component has similar view to seasonal in longer period. ***(Groebner, Shannon, Fry, & Smith, 2007)***

Random Component

As yet; we have pointed trend, seasonal and cyclical components that have regular behaviour. Trend component has increasing or decreasing patterns. Also seasonal and cyclical components have wavy but repetitive and "predictable" patterns. However, not all time series have those patterns and have "unpredictable" behaviours refers random component. ***(Groebner, Shannon, Fry, & Smith, 2007)***

Random component might be described as cluster of noise since all the patterns are independent and random.

3.2.5. Correlation Coefficient

Correlation in statistics refers the relationship between two variables. There are some scenarios we may observe:

- One of the variable influences the other one,
- Both of the variables influence each other,
- Both of the variables are influenced by a third factor.

Correlation coefficient is a value which shows how strong relation the variables have. The coefficient value can be between -1 and 1. Negative values stands for negative, positive values refers positive correlation. The relationship gets increased as it moves away from zero. When it is zero there is no correlation and when its -1 or 1 there is perfect negative or positive correlation. Correlation is calculated via Pearson's correlation coefficient formula.

Equation 6: Pearson Correlation Coefficient

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

Where:

r_{xy} = The correlation coefficient of the linear relationship between the variables x and y

x_i = The values of the x-variable in a sample

$\bar{x}$ = The mean of the values of the x-variable

y_i = The values of the y-variable in a sample

$\bar{y}$ = The mean of the values of the y-variable

(Corporate Finance Institute, 2019)

4. Practical Part

4.1. View of the Selected Economic Indicators in Turkey

In this section we will monitor and analyse the economic indicators of Turkey that was mentioned earlier. The different sources with the largest data are preferred in order to visualize the changes over the years more accurately.

OECD Sources are used in order to analyse GDP, inflation and exchange rates.

For the data of policy interest rates, Central Bank of the Republic of Turkey (CBRT) sources are used.

Turkish Statistical Institute (TurkStat) provides the larges data for Balance of Trade statistics and for the same reason it is preferred.

World Bank data is used for the calculations of unemployment rates.

For each indicator, we will try to determine which time series component suits to their behaviour. As using index number, we will be able to see the differences between years.

We will also try to understand the reasons of some extreme points of the charts with some social and political factors.

Any government has different economic strategies than the previous or future one. While working with larger data, we will also focus on shorter periods. Therefore the most recent Government period (from 2002 to 2018) of Turkey will be briefly analysed based on the selected economic indicators.

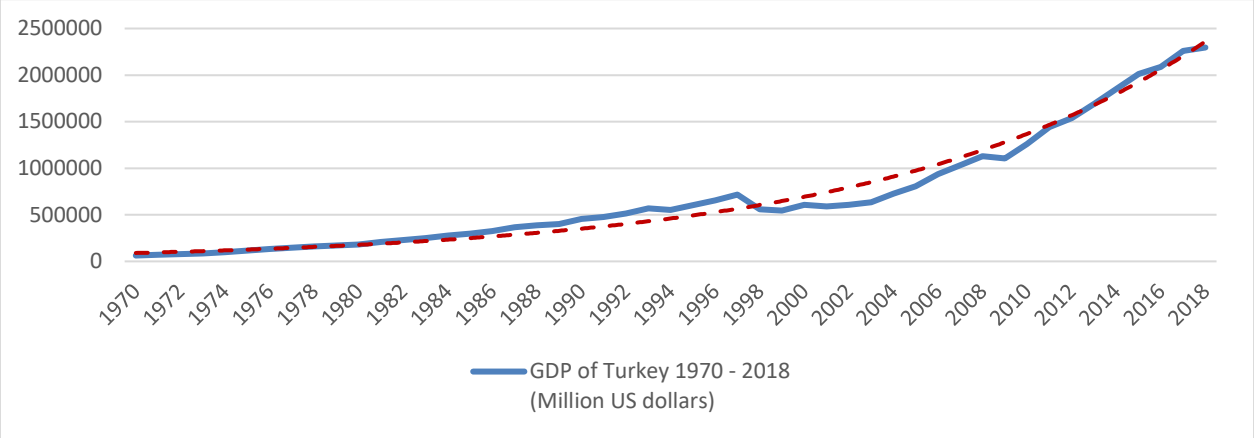
4.1.1. GDP View

GDP is one of the strongest evidence that shows the development of a country.

Here under this title, we will monitor the GDP evolution of Turkey.

Below, there is a chart visualize GDP journey of Turkey from 1970 till 2018.

Figure 5: GDP of Turkey (1970 – 2018)



(Source: Created by the author with the data of Table 10)

From the Figure 5, it can be observed that there is an upward trend throughout the years even though there are some decreasing cases. We are able to calculate the average annual growth rate (AAGR) of 48 years (1970-2018) as 8.01%. In other words from 1970 to 2018, Turkish economy has grown 8.01% on average, each year:

Table 6: Average Annual Growth Rate Calculation

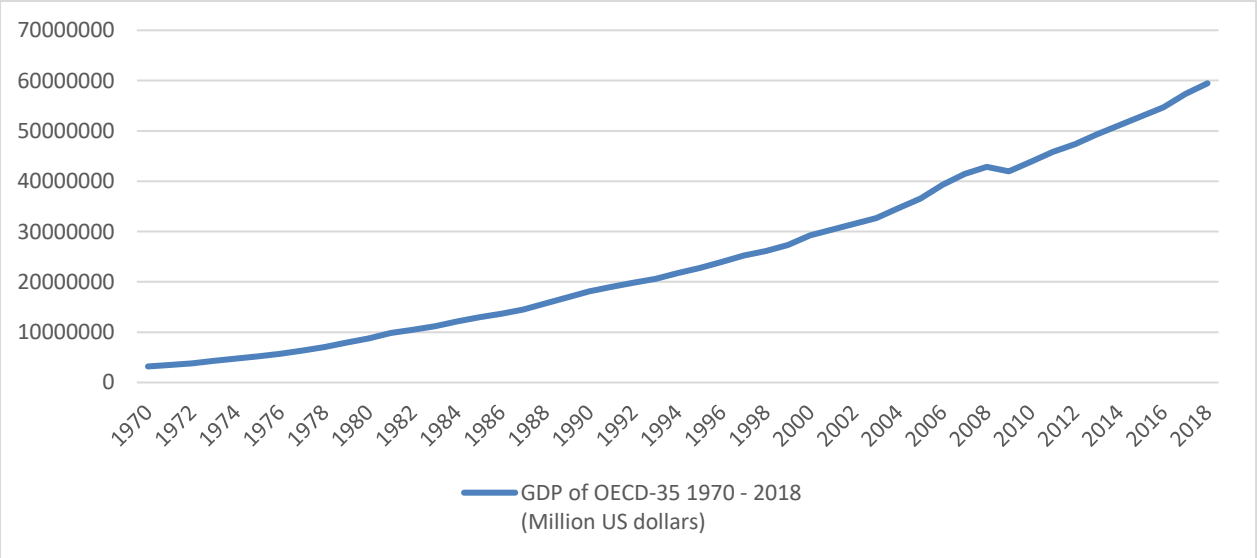
No	Year	GDP of Turkey 1970 - 2018 (Million US dollars)	Annual Growth Rate $(GDP_{(n)} - GDP_{(n-1)}) / GDP_{(n-1)}$
1	1970	62720	-
2	1971	69568	10.92%
3	1972	77965	12.07%
…	…	…	…
24	1993	570437	10.60%
25	1994	550833	-3.44%
…	…	…	…
48	2017	2261007	8.32%
49	2018	2296105	1.55%
Average Annual Growth Rate (AAGR)			**8.01%**

(Source: Calculated by the author with the data of Table 10)

Some of the extreme points of Figure 5 can be explained with some internal and external reasons ***(BBC, 2018)***:

- 1994: The crisis is caused by unsuccessful economy management and the populist policies of the government. In the beginning of 90s, the state started to borrow via public banks in order to compensate the state expenditures. However this caused a serious debt for the state.
- 1997: Asian Financial Crisis occurred. Russia and some other economic partners of Turkey are affected negatively by the Asian financial crises, so Turkey did.
- 1999: Turkey hit by huge earthquake. Earthquake was based in the top industrial cities such as Istanbul and Izmit. Industrial areas were damaged and thousands of people died or injured. Marmara Earthquake put an extra cost on the state budget that took years to recover.
- 2001: As known name "2001 Turkish Economic Crisis" started after the meeting of National Security Council on Monday, 19 February 2001. Numbers of Banks were bankrupted, Istanbul Stock Exchange depreciated over 20 percent in one day. Overnight interest rates extremely increased.
- 2008: One of the biggest Investment Bank of US "Lehman Brothers" went to bankruptcy. Subprime Mortgage Crisis occurred. Global economic crises affected Turkey as all other countries.
- 2015: Military coup attempt on 15th July. Economic growth was continued but slowed.

Figure 6: GDP of OECD-35 (1970 - 2018)



(Source: Created by the author with the data of Table 11)

The Figure 6 shows the average growth trend for OECD-35 (all OECD countries except the newest member Lithuania) countries that is calculated with the same principle as Figure 5, and the result is 6.33%. This result shows that GDP increase of Turkey from 1970 to 2018 is higher than average GDP increase of OECD-35 countries during the same period.

As mentioned before, each government has different economic strategic plans. In order to analyse economic performance of the most recent government (Justice and Development Party – R.T. Erdogan) of Turkey we need to focus on the data between 2002 and 2018.

Below, in Table 7, index numbers method is used in order to compare the years. Also we will calculate average annual growth rate to compare with the previous larger data.

Table 7: Average Annual Growth Rate & Index Numbers (2002-2018)

No	Year	GDP of Turkey (Million US dollars)	Annual Growth Rate	Index Numbers (Base Year: 2002)	
0	2001	591540	-	-	%
1	2002	607794	2.75%	100	
2	2003	634715	4.43%	104	4.43%
3	2004	727743	14.66%	120	19.74%
4	2005	807227	10.92%	133	32.81%
5	2006	936569	16.02%	154	54.09%
6	2007	1033244	10.32%	170	70.00%
7	2008	1130487	9.41%	186	86.00%
8	2009	1104759	-2.28%	182	81.77%
9	2010	1260360	14.08%	207	107.37%
10	2011	1443296	14.51%	237	137.46%
11	2012	1539111	6.64%	253	153.23%
12	2013	1690856	9.86%	278	178.20%
13	2014	1851026	9.47%	305	204.55%
14	2015	2012362	8.72%	331	231.09%
15	2016	2087370	3.73%	343	243.43%
16	2017	2261007	8.32%	372	272.00%
17	2018	2296105	1.55%	378	277.78%
Average Annual Growth Rate			**8.42%**		

(Source: Calculated by the author with the data of Table 10)

Above the Table 7 shows that AAGR of selected period (2002-2018) is 8.42% which is 5.10% higher than previous period (1970-2018). In other words, Erdogan's Government period have 5.10% better GDP growth performance than over the time since 1970.

According to index numbers, we can also conclude:

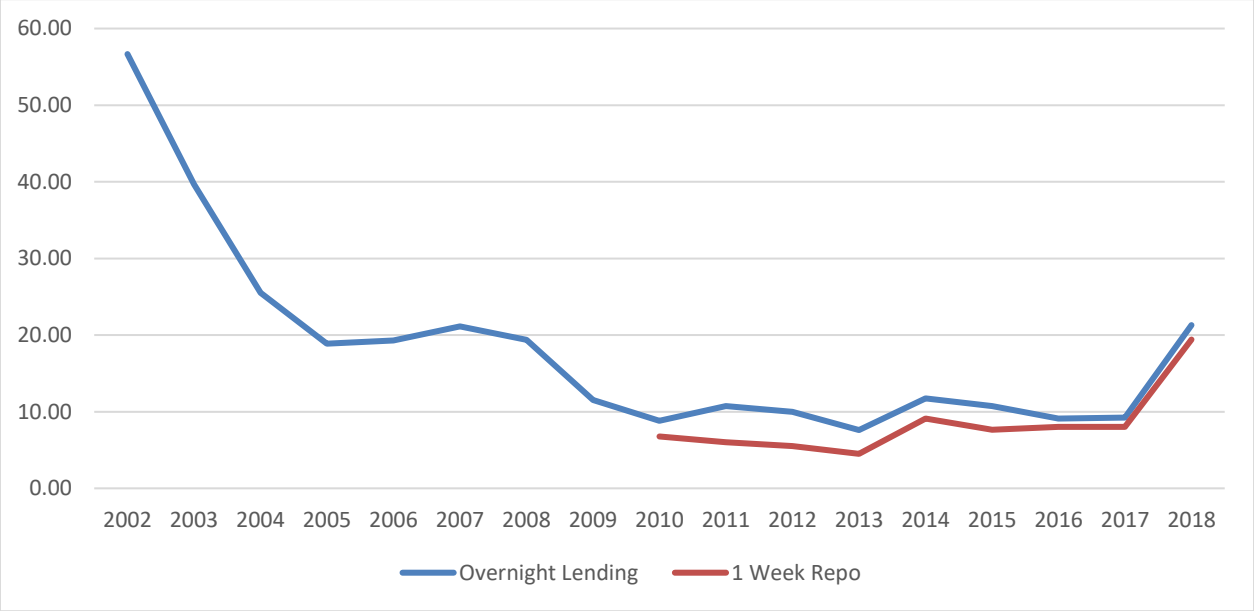
- GDP of Turkey in 2003 is 4.43% higher than the base year 2002
- GDP of Turkey in 2004 is 19.74% higher than the base year 2002
- …

4.1.2. Policy Interest Rates

Overnight and 1 week repo values are some of the instruments that Central Bank of Turkey uses in order to set policy interest rates.

Regarding to Figure 7; the raw data (Table 12 and Table 13) is converted to yearly base as using averaging method.

Figure 7: Policy Interest Rates



(Source: Created by the author with the data of Table 12 & Table 13)

In 2002, Erdogan's Government took over very high policy interest rates from the previous government. One of the main goal of the government was decreasing the interest rates to avoid negative effects of high interest rates via economic reforms.

As the graph shows, until 2010 there has been a decreasing trend.

From 2010 to 2017, we may remark that there is –more or less- stable interest rates comparing to previous periods.

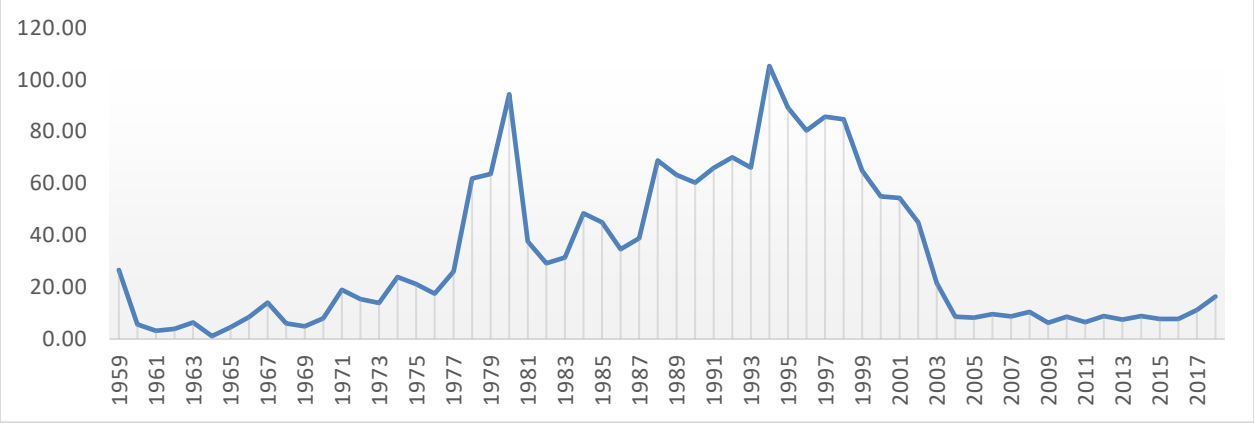
From 2017, because of the high capital outflow from Turkey, Central Bank had to increase policy interest rates dramatically in order to attract foreign investors. ***(Yalınkılıç, 2018)***

If we focus on the period from 2010 till now, the graph verifies there is a positive correlation (r value: 0.96) between two different policy interest instruments which are overnight lending and 1 week repo.

4.1.3. Inflation Rates

Inflation is the most crucial factor that affects households directly. Below we have inflation view of Turkey from 1959 to 2018.

Figure 8: Inflation (CPI) Total, Annual growth rate (%) (1959 – 2018)



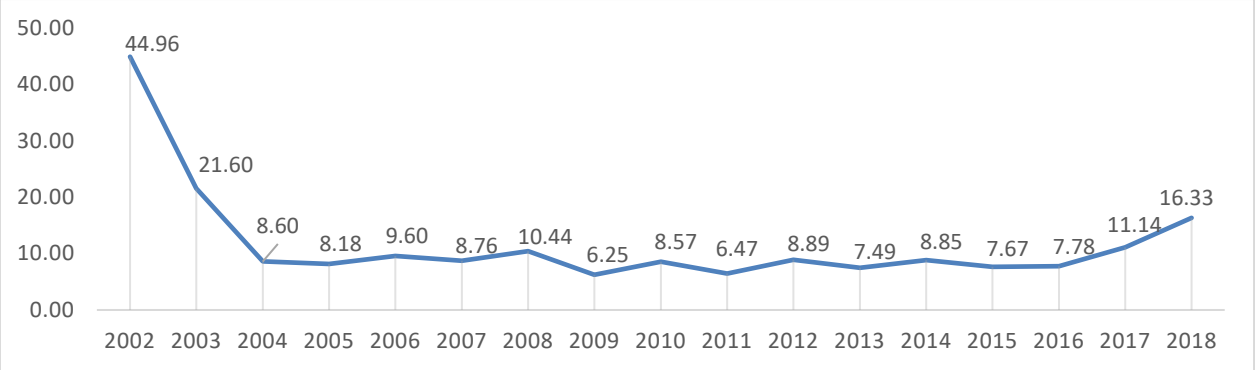
(Source: Created by the author with the data of Table 14)

The first thing that stands out of the graph (Figure 8) within the given period is that inflation has been performing a random behaviour. We cannot really remark there is an upward, downward trend or cyclical view.

From 1974 till 2003, we can observe the characteristics of the galloping inflation because of two or three digits inflation rates.

From 1993 (the peak point of inflation) to 2004 there is a downward trend on inflation view.

Figure 9: Inflation (CPI) Total, Annual growth rate (%) (2002 – 2018)



(Source: Created by the author with the data of Table 14)

The chart (Figure 9) shows the period of inflation between 2002 and 2018. In this period, we can view that inflation rates are more stable and also mainly performs moderate inflation. From 2004 to 2016, cyclical behaviour would be observed.

Erdogan's Government strongly supports the idea that the high interest rates have an increasing effect on inflation. Therefore, Erdogan has been criticizing the approach of Central Bank and pressing the authorities to decrease the interest rates which caused conflicts between the Government and Central Bank. It ended up with the termination of the Governor of Central Bank (Erdem Başçı) by Erdogan in July, 2019 for the reason of different opinions between the governor of Central Bank and Erdogan's economy policy. ***(Reuters, 2019)***

The chart (Figure 10) below shows the combined view for the inflation rates and policy interest rates of Turkey between 2002 and 2018.

Figure 10: Policy Interest Rate & Inflation Rate Relation (2002-2018)

(Source: Created by the author with the data of Table 12 & Table 14)

The chart above proves the approach of Erdogan. Since the correlation coefficient is 0.9013, it can be clearly observed that interest and inflation rates are very highly and positively correlated in Turkey. It is also related about the reason of inflation in Turkey. Mainly, the inflation is caused by cost-push factors. Especially decreasing Turkish lira have increasing effect on the costs of input which cause inflation. In other words, increase of interest rates causes an increase of inflation. However since there are several other factors which may affect the inflation rates, we cannot certainly say that increase of interest rate is the only reason of high inflation.

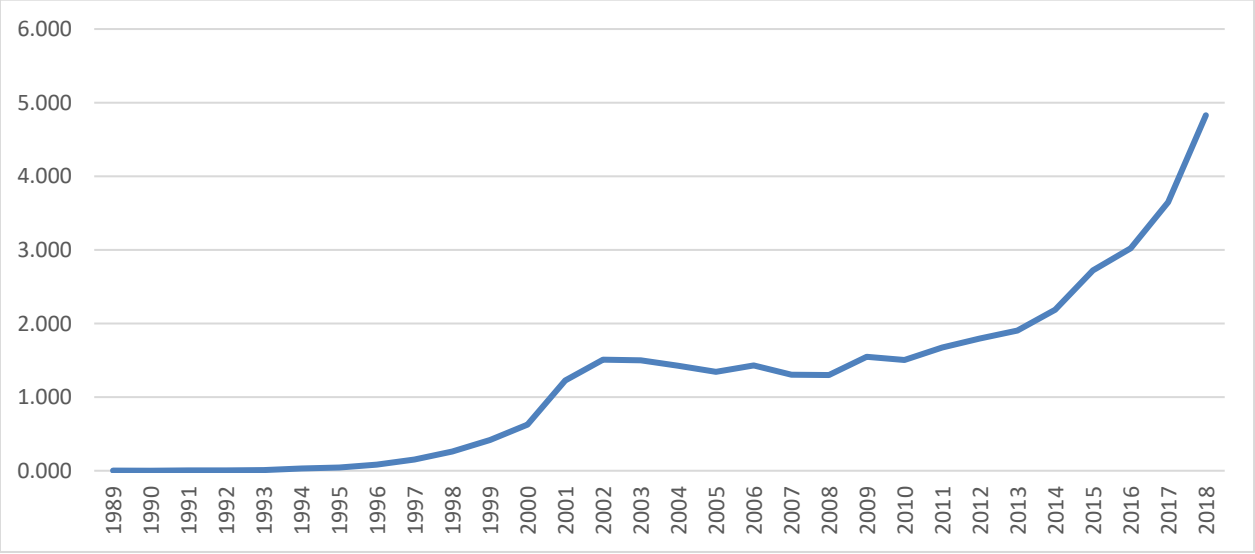
4.1.4. Exchange Rate

Exchange rate has crucial effect in economies. It affects foreign trade balance, inflation rates and other parameters that changes economic conditions of households direct and indirectly.

Until 80s, Turkey used to apply fixed exchange system. Central Bank of Turkey determines the exchange rate and regulates anomalies as devaluations. After 1980, it is switched to floating system that the exchange rate is determined by free market conditions. In this system Central Bank and Government has authorize to regulate via some instruments but the rate still is set by free market conditions. ***(Egilmez, 2012)***

Below, there is the graph (Figure 11) shows the exchange rates of TRY/USD since 1989.

Figure 11: Exchange rates - Total, National TR lira/US dollar, 1989 – 2018



(Source: Created by the author with the data of Table 15)

Until 2002 Turkish Lira has a decreasing trend because of the unsuccessful fiscal policies of Turkey. According to IMF stand-by agreement, Turkey applied tight fiscal policies from 1999 which was extended 2001 after the economic crises. After this period, almost 10 years the parity was more or less stable until 2010. This period was called as golden years of Turkish Economy according to several indicators.

After 2009 global economic crises and rising interest rate policy of FED (Federal Reserve / Central Banking System of the United States of America) affected the currencies of developing countries to decrease, so Turkish Liras did.

On the Table 8, there is annual interest rate change of FED between the years 2012 and 2018.

Table 8: FED Interest Rates (2012-2018)

Interest Rates* ***The fed funds rate is the interest rate at which depository institutions (banks and credit unions) lend reserve balances to other depository institutions overnight, on an uncollateralized basis.**							
Year	2012	2013	2014	2015	2016	2017	2018
Annual Change (%)	125.00%	-22.22%	-14.29%	233.33%	175.00%	141.82%	80.45%

(Macrotrends, 2019)

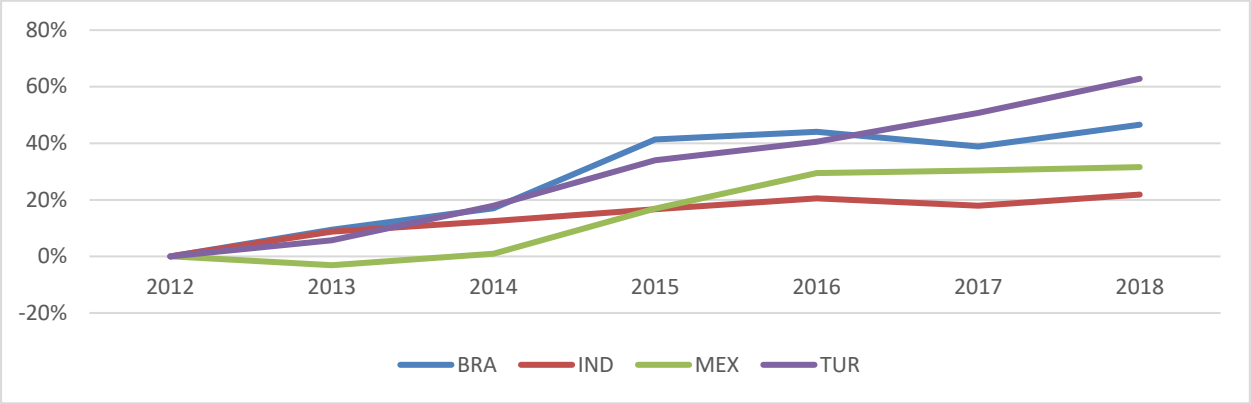
As Table 8 shows there are dramatic interest rate increases each year (with an exception in 2014). Below, there are some (fragile) developing countries (Brazil, India, Mexica, Turkey) and exchange rate changes against USD during the same period (2012-2018) with its graph on base year 2012.

Table 9: Difference of National currencies / US dollar (%) - Base Year: 2012

Years	BRA	IND	MEX	TUR
2012	-	-	-	-
2013	9%	9%	-3%	6%
2014	17%	12%	1%	18%
2015	41%	17%	17%	34%
2016	44%	20%	29%	41%
2017	39%	18%	30%	51%
2018	47%	22%	32%	63%

(Source: Calculated by the author with the data of Table 15)

Figure 12: Exchange Rate Difference (USD / National Currencies)



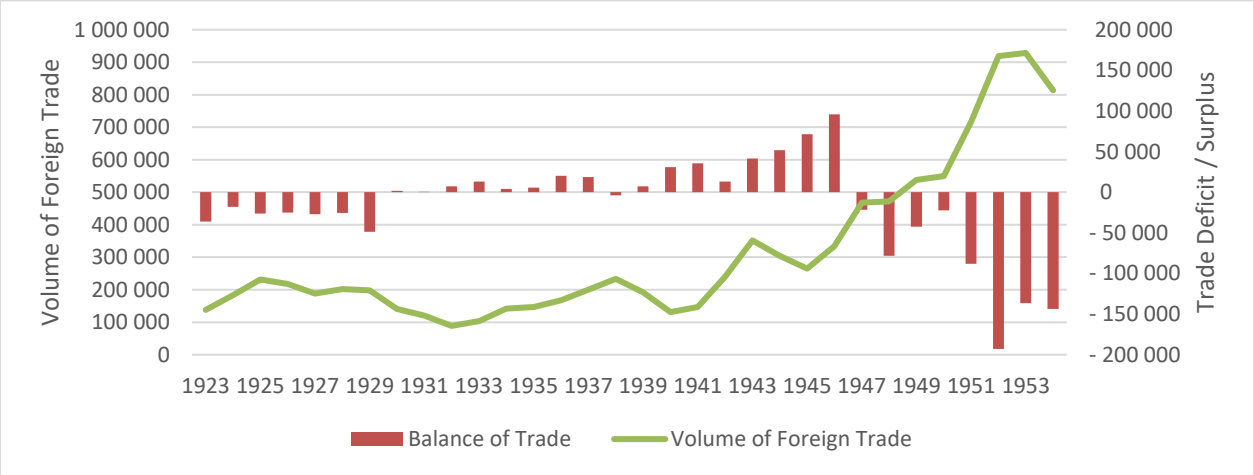
(Source: Created by the author with the data of Table 9)

As Figure 12 shows that all the currencies are performing losing trend against of USD during given period. Since 2012, Turkish lira has the most extreme decreasing trend against USD within 4 developing countries. Not only increasing interest rate policy of FED, but also other factors such as political instability, incorrect economy policies, high foreign trade deficit, EU-Turkey-USA relations and Syrian war made a multiple impact on the economy of Turkey and Turkish lira.

4.1.5. Balance of Trade

Globalization brings integrated economies. As mentioned in the theoretical part, the situation when export incomes are higher than import expenditures called trade surplus the other way round called trade deficit that affects the economies negatively.

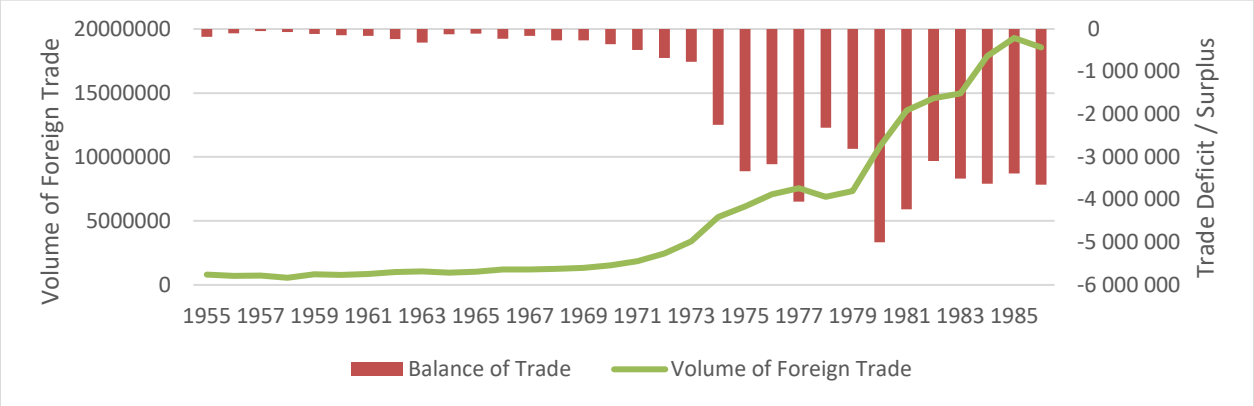
Figure 13: Foreign Trade Balance (1923-1954) Value: Thousand US $



(Source: Created by the author with the data of Table 17)

Table 17, 18 and 19 give us a large data about foreign trade details of Turkey since it has been founded. As Figure 13 shows, within 96 years, only 16 years of Turkish economy was able to meet foreign trade surplus between 1930 – 1947 years. However the reason of surplus was not the increase of export goods, but the effects of "Depression Era", II. World War and protectionist foreign trade policy of Turkey. It took 12 years to reach the volume of foreign trade until 1930.

Figure 14: Foreign Trade Balance (1955-1986) Value: Thousand US $

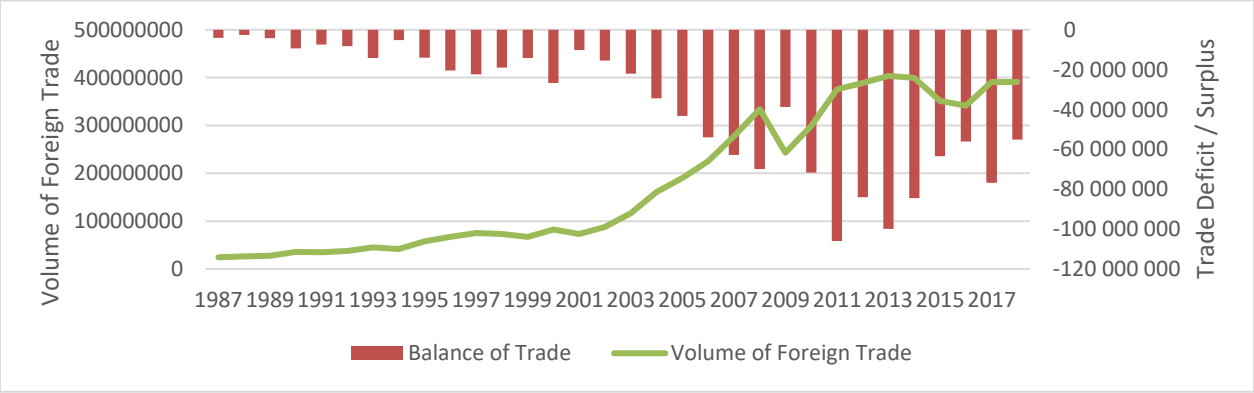


(Source: Created by the author with the data of Table 18)

Until 70s, agriculture was the major sector of Turkey's economy. Import substitution industrialization model had been tested but was not very successful.

From 1973, according to the agreements with IMF and World Bank, Turkey left the protectionist economy model and opened to the world market. As the Figure 14 shows, after the stand-by agreement with IMF in 1973 the volume of foreign trade started to rise up. However the reason of the increase was rising import volumes, mainly. ***(Iktisatkolik, 2016)***

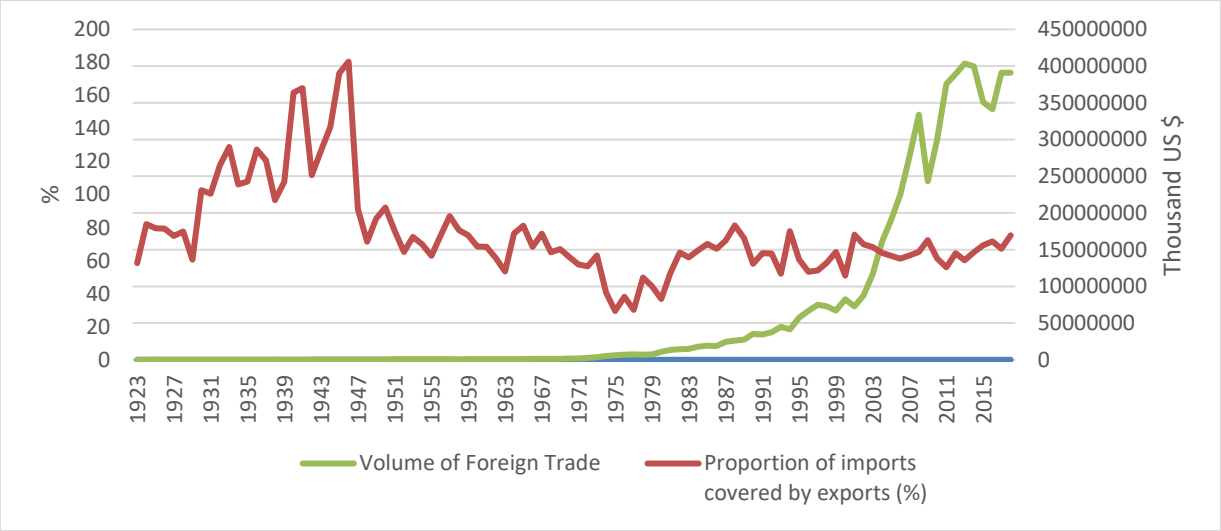
Figure 15: Foreign Trade Balance (1987-2018) Value: Thousand US $



(Source: Created by the author with the data of Table 19)

Liberalization attempts accelerated from 80s. Customs Union Agreement which was signed between European Union and Turkey in 1995, provided open-door opportunity for both sides to make custom free trade. After 2002, Erdogan's Government gave importance to foreign trade and encourages the companies to increase export volumes. In 2005, European Leaders decided to start accession negotiations with Turkey for fully membership which gave trust to markets to invest on Turkey. Figure 15 shows, all these progress boosted the foreign trade volume of Turkey but could not help to narrow the trade deficit. ***(Cetin & Savrul, 2016)***

Figure 16: Foreign Trade Balance (1923-2018)

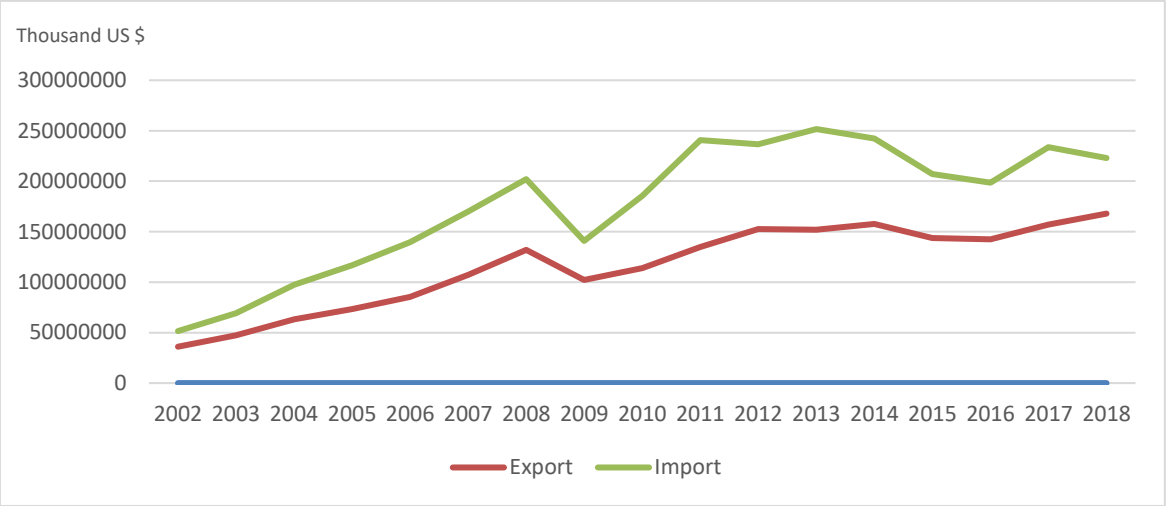


(Source: Created by the author with the data of Table 17, Table 18 & Table 19)

It is useful to monitor the proportion of imports covered by exports via Figure. We can comment that there is no correlation between the volume of foreign trade and proportion of imports covered by export. We can also calculate via Table 17, 18 and 19 that the average rate for proportion of imports covered by exports between 1923 and 2018 is %77. In other words, the average rate for coverage import outgoings with the export incomes is %77. If we consider sum of the volume of the trade and make the same calculation with weighted average rate, we find even lower rate which is 65%.

Figure 17 shows the situation of balance of foreign trade between the years 2002 and 2018.

Figure 17: Export & Import Values (2002-2018)



(Source: Created by the author with the data of Table 19)

The chart above shows the situation of balance of foreign trade between the years 2002 and 2018. The upward trend is going on for both import and export values.

It is possible to comment that global economic crises in 2009 had decreasing effect on both import and export.

Figure 18: Export Shares (2018)

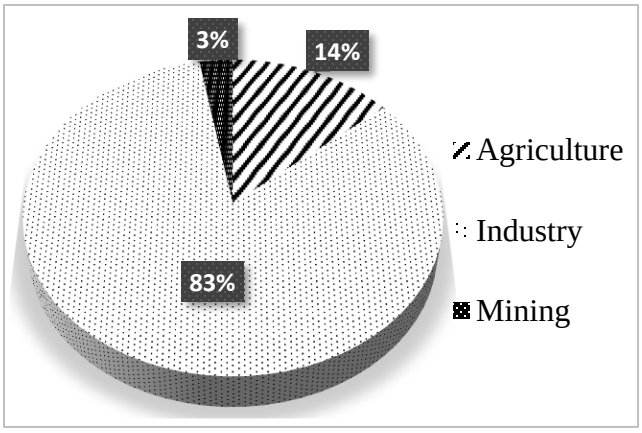


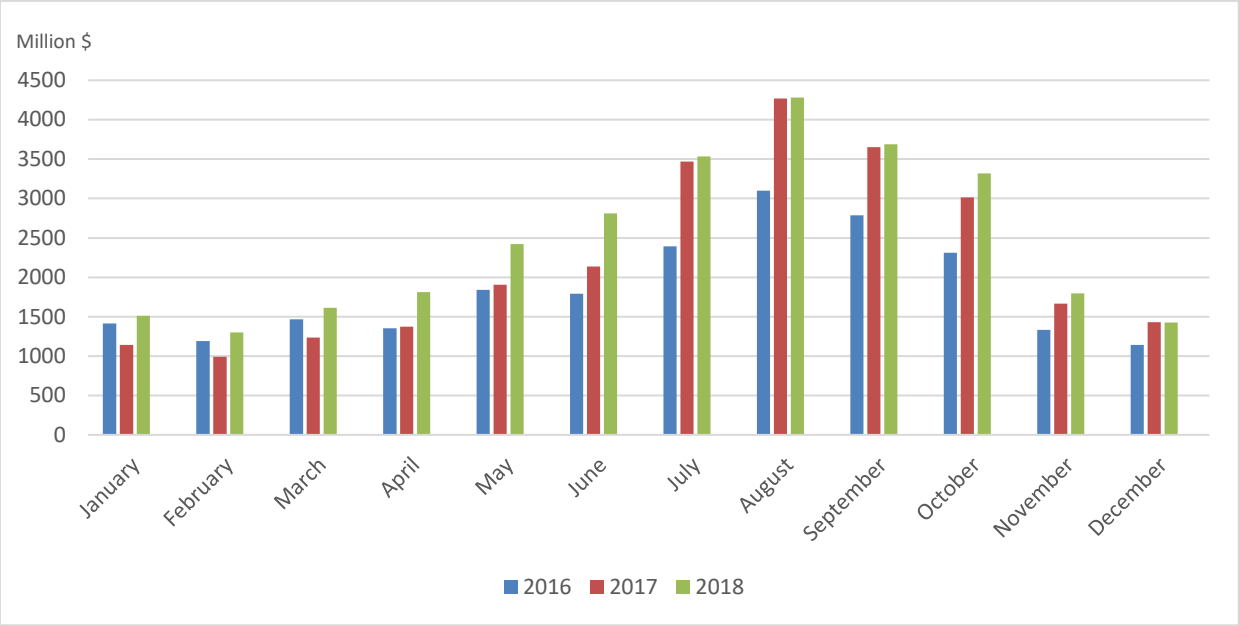
Figure 18 shows the export shares according to the sectors for 2018 in Turkey. Agriculture products has 14% of all export products. The biggest share (83%) of export products are industrial products via leading automotive sector. Remaining share contains mining industry which is only 3% of all export products.

(Source: Created by the author with the data of Table 20)

Tourism is a huge income source for Turkey. As mentioned in theory, some economists count tourism receipts as an export income.

The chart below shows the tourism receipts of Turkey between the years 2016 and 2018.

Figure 19: Tourism Receipts (2016-2018)



(Source: Created by the author with the data of Table 21)

Beside cultural tourism and the other kinds (business trips etc.), summer tourism has a big impact on total tourism income.

From Figure 19 we can easily observe the seasonal behaviour on chart. Each year the most tourism income comes in August. We can also see the other high values in the other months of the summer season.

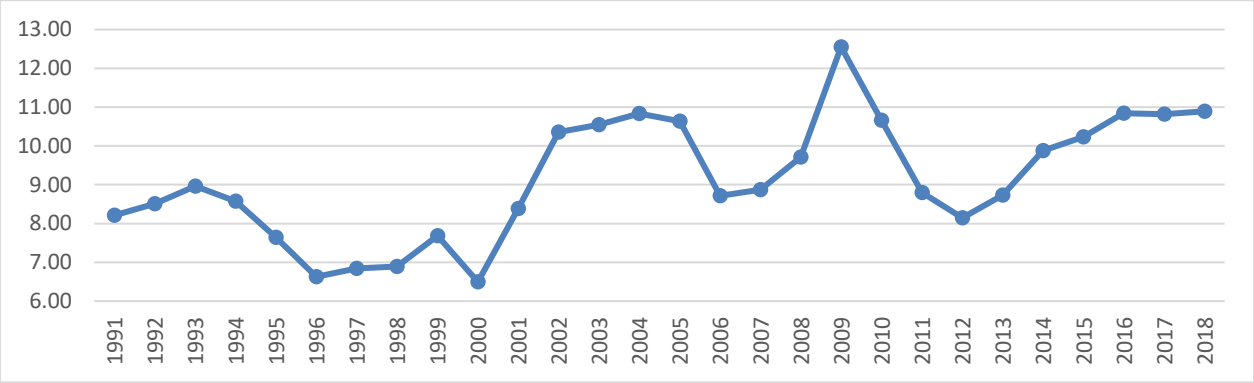
2015 political crises between Turkey and Russia affected the tourism income of 2016 negatively since Russian tourists have the highest share of all other tourists. From 2017, the political crises between Turkey and Russia was resolved and tourist income started to raise again.

4.1.6. Unemployment

Unemployment is a serious issue for households and entire economy.

The chart below shows the unemployment rate of Turkey from 1991 to 2018

Figure 20: Unemployment Rates (1991 - 2019) (%)

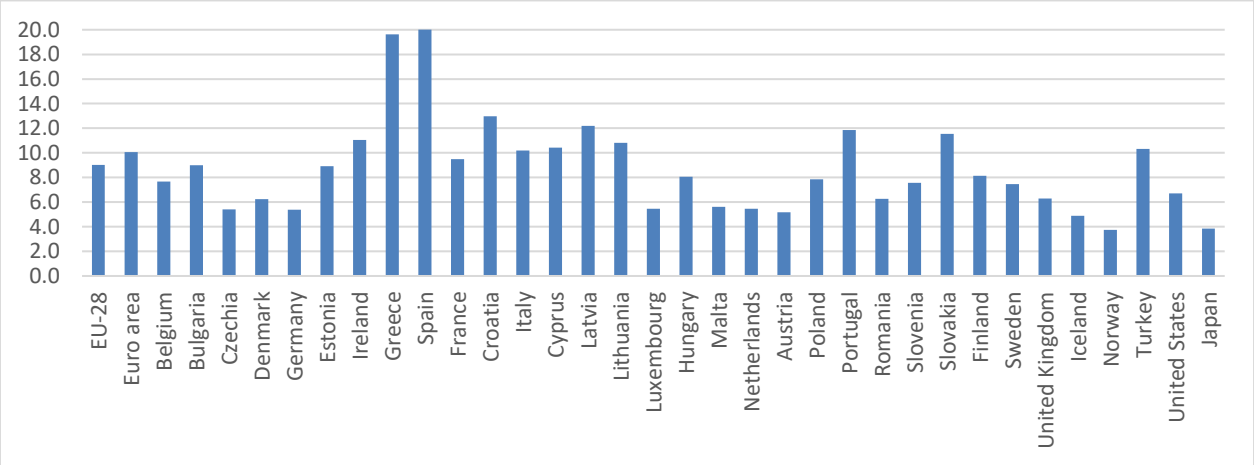


(Source: Created by the author with the data of Table 22)

From Figure 20, we can comment that the unemployment rate has rising behaviour before, after and during the economic and political crises periods (2001 Turkey Economic Crises, 2009 Global Economic Crises, 2013 Gezi Park Protests and 2016 Military coup attempt).

The average unemployment rate between 1991 and 2018 of Turkey is 9.14% which is above "natural unemployment rate" estimated by FED. The same rate during Erdogan's Government period is 10.07%.

Figure 21: Average Unemployment Rate % (2008-2018)



(Source: Calculated and created by the author with the data of Table 23)

Table 23 gives us the data of unemployment rates by EuroStat between 2008 and 2018 years. The chart above shows the average unemployment rates during the same period. We can calculate that Spain has the highest average unemployment rate as 20% between 2008 and 2018 years. Greece is following Spain with 19.5% average unemployment rate. These two countries unemployment rates are dramatically higher than EU-28, Euro Area and Turkey's rates.

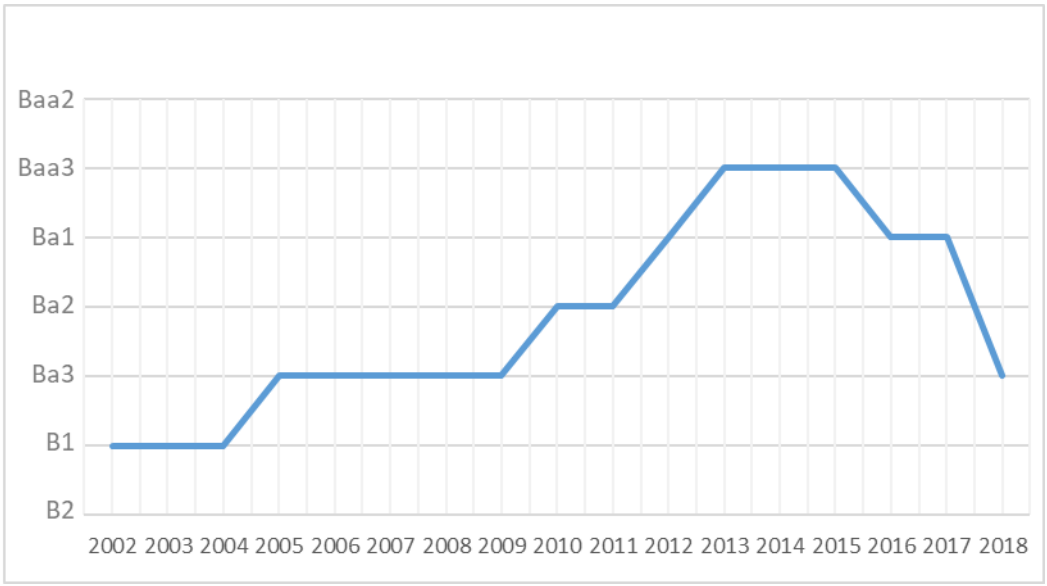
Another interesting result from the Figure 21 is that EU-28 countries has better performance on unemployment issue than Euro Area countries.
Turkey almost reaches Euro Area unemployment rates but still higher than both Euro-28 and Euro Area rates.
Norway which is not in European Union or Euro Area, has the lowest unemployment rate with 3.7%. Also with the second lowest standard deviation value, Norway has one of the most stable unemployment rate after the Netherlands within the given years.

4.2. Credit View of Turkey

Credit Rating Agencies (The Big Three) are evaluating countries' financial and economical view according to their criteria.

The chart below shows Moody's credit rating of Turkey between 2002 and 2018

Figure 22: Moody's Credit Grades for Turkey (2002-2018)



(Source: Created by the author with the data of Table 24)

Via Figure 22, it can observed that Turkey was able to be in the investment grade category (the grades and categories are explained in detail in the theory part) only for 3 years (2013, 2014 and 2015). Even in these years, the grade of Turkey was in the lowest investment grade category which is called “lower medium grade”. However this grade is still attractive for foreign investors with higher risk factor but also high revenues.

Rest of the years Turkey has been under Baa3 level which is non-investment category. In this category, since the risk factor is getting higher and speculative, investors have cautious behaviour for Turkey. In this category, current investors may flow out their investments or new investors may postpone their plans.

The average grade within between 2002 and 2018 is Ba2 which is in non-investment category.

Military coup attempt in 2015, Syrian war, political issues with US, increasing inflation rates and uncontrollable decrease of Turkish lira have a big impact on Moody’s downgrade decisions. ***(Weltman, 2019)***

There are several discussions about the rating agencies that they actually try to manipulate the reports via the oppression of lobbies. ***(Global Daily News, 2018)***

Even though Erdogan accuses rating agencies as fraudsters, investors will keep consider their reports and reviews.

5. Results

RQ1: Turkish Statistical Institute (TurkStat) is a local and governmental organisation that keeps data, analyse and publish the results. Since Turkey is a candidate member of European Union, EuroStat uses the data of TurkStat and also analyse and publish it.

OECD is an international economic organisation and Turkey is part of it. Hence, OECD also watches and publish the statistical data of Turkey in public platforms.

RQ2: GDP view of Turkey has an increasing trend. However inflation, exchange and interest rates are not stable which puts Turkey into fragile economies. Unemployment rate is not the worst comparing to European partners but the most recent data shows that is in a rising trend.

RQ3: Credit Rating Agencies are evaluating financial situation of the countries. Companies or countries consider the grades of these agencies before investing on a country. Overall report of Turkey is bleak and placed in non-investment grade.

RQ4: All economic indicators are somehow connected and affect each other. In this study, the remarkable relation is the strong positive correlation between inflation and interest rates.

RQ5: After observing the data of the indicators; it can be commented that there are several factors which affect the economy such as wars, internal or international political crises and natural disasters.

6. Conclusions

Countries try to grow their economies as far as their capacities. Instead of a rapid growth, the important point is the sustainable growth with an increasing trend in a harmony with the other dynamics of the economy.

In this thesis, we had opportunity to map the main economic indicators of Turkey with the statistical data records throughout years.

The overall economic performance of Turkey has a rising trend. Especially the average GDP growth rate of Turkey since 1970 has an impressive increase which has higher rates than the average GDP growth of the OECD countries during the same period. However GDP growth itself cannot be the only evidence to determine if an economy is good enough and other factors should be taken into account.

As a results of the analysis and observations we can conclude that the inflation overview of Turkey have been in a very turbulent period until 2000s. High inflation rates had been forcing the budget of households. After 2000s, it has been more stabilized but the increasing inflation trend of the last a few years show that stability of single digit inflation is not constant.

The persistent currency devaluation of Turkish lira against the U.S. dollar because of the political and economic crises has an increasing effect on inflation that impoverishes households. It also affects the foreign trade balance and presents unpredictable and speculative view for Turkey.

On the other hand, the devaluation of Turkish lira has an increasing effect on exports with the reason the products and services become more competitive and attractive for the other markets. However since there is a trade balance deficit in the economy, the devaluation of Turkish lira affects balance of payments negatively.

High interest rates have both increasing effect on the inflation and also decreasing impact on infrastructure investments. In a connection of this issue, the down-trend of investments boosts unemployment issue which ceases the GDP increase.

Another conclusion of this study is the importance of non-economic factors' impacts on an economy such as wars, political crises, natural-disasters etc. which causes dramatic changes on the economic indicators as observed.

The geopolitical position and socio-political situation of Turkey brings tough circumstances that affects the economy positive or negative rapidly. The forecasting techniques may not give the best results for such countries in instable socioeconomic situation.

Improving the international relations and cooperation; respecting international human rights, equality and freedom should be the main aim of the Governments in order to gain trust and economic development.

7. Recommendations

After the analysed data and the findings of the research it can be concluded with a set of recommendations below:

- Turkey has an increasing growth trend which should be maintained,
- Interest rates should get lowered which would help to decrease inflation and contribute economic revival,
- Factors that increase inflation rate should be determined to avoid high inflation,
- Unemployment rate should be lowered in order to contribute the economy,
- Depreciation of Turkish lira should be prevented,
- Export volume should be increased to close the gap on the balance of trade,
- The economic indicators should be stabilised in order to attract investors.

8. Bibliography

Amadeo, K. (2019, 5 4). *Exports and Their Effect on the Economy*. Retrieved from thebalance.com: https://www.thebalance.com/exports-definition-examples-effect-on-economy-3305838

Amadeo, K. (2019, 3 8). *Imports and How They Affect the Economy*. Retrieved from thebalance.com: https://www.thebalance.com/imports-definition-examples-effect-on-economy-3305851

Amadeo, K. (2019, 5 7). *Natural Rate of Unemployment, Its Components, and Recent Trends*. Retrieved from thebalance.com: https://www.thebalance.com/natural-rate-of-unemployment-definition-and-trends-3305950

Arthur O'Sullivan, S. M. (2003). *Economics: Principles in Action.* Prentice Hall.

Bank of Canada. (2019). *Policy Interest Rate*. Retrieved from bankofcanada.ca: https://www.bankofcanada.ca/core-functions/monetary-policy/key-interest-rate/

BBC. (2018, 8 17). *Türkiye'deki ekonomik krizler: 1994, 2001 ve 2007'de neler yaşandı?* Retrieved from bbc.com: https://www.bbc.com/turkce/haberler-turkiye-45226072

BillionTrader. (2015, 4 10). *Rating agencies: Moody's, S&P and Fitch*. Retrieved from billiontrader.com: http://billiontrader.com/2015/04/10/rating-agencies-moodys-sp-and-fitch/

Business Jargons. (2019). *Types of Inflation*. Retrieved from businessjargons.com: https://businessjargons.com/types-of-inflation.html

Cambridge University Press. (2019). *Dynamic*. Retrieved from dictionary.cambridge.org: https://dictionary.cambridge.org/dictionary/english/dynamic

Cambridge University Press. (2019). *Economic Growth*. Retrieved from dictionary.cambridge.org: https://dictionary.cambridge.org/us/dictionary/english/economic-growth

Cambridge University Press. (2019). *Forecasting*. Retrieved from dictionary.cambridge.org: https://dictionary.cambridge.org/dictionary/english/forecasting

Campbell R. McConnell, S. L. (2017). *Macroeconomics.* McGraw-Hill Education.

Central Bank of the Republic of Turkey. (2019). *1 Week Repo*. Retrieved from tcmb.gov.tr: https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Core+Functions/Monetary+Policy/Central+Bank+Interest+Rates/1+Week+Repo

Central Bank of the Republic of Turkey. (2019). *CBRT Interest Rates (%) Overnight (O/N)*. Retrieved from tcmb.gov.tr: https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Core+Functions/Monetary+Policy/Central+Bank+Interest+Rates/CBRT+INTEREST+RATES

Cetin, E., & Savrul, M. (2016). Türkiye'de 1980 Sonrası Liberalleşme Sürecinde Dış Ticaretteki Gelişmelerin Türkiye'nin Cari Açığına Etkisi. *Journal of Administrative Sciences*. Retrieved from ybd.dergi.comu.edu.tr: http://ybd.dergi.comu.edu.tr/dosyalar/Ybd/turkiye-de-1980-sonrasi-liberallesme-surecinde-dis-ticaretteki-gelismelerin-2017-02-14-272.pdf

Corporate Finance Institute. (2019). *Correlation*. Retrieved from corporatefinanceinstitute.com: https://corporatefinanceinstitute.com/resources/knowledge/finance/correlation/

Costanza, R., Hart, M., Posner, S., & Talberth, J. (2009). *Beyond GDP: The Need for New Measures of Progress.* Boston: Boston University.

Council on Foreign Relations (CFR). (2019). *The Credit Rating Controversy*. Retrieved from cfr.org: https://www.cfr.org/backgrounder/credit-rating-controversy

Country Economy. (2019). *Turkey Credit Rating*. Retrieved from countryeconomy.com: https://countryeconomy.com/ratings/turkey

Economics, F. (2019). *What is GDP per capita?* Retrieved from focus-economics.com: https://www.focus-economics.com/economic-indicator/gdp-per-capita

Egilmez, M. (2012, 10 7). *Kur Rejimleri ve Türkiye Uygulaması*. Retrieved from mahfiegilmez.com: http://www.mahfiegilmez.com/2012/10/kur-rejimleri-ve-turkiye-uygulamas.html

European Union. (2019). *About the EU*. Retrieved from europa.eu: https://europa.eu/european-union/index_en

European Union. (2019). *European Union*. Retrieved from europa.eu: https://europa.eu/european-union/index_en

European Union. (2019, 4 29). *The EU in brief*. Retrieved from europa.eu: https://europa.eu/european-union/about-eu/eu-in-brief_en

EuroStat. (2019). *EuroStat*. Retrieved from ec.europa.eu/eurostat: https://ec.europa.eu/eurostat

EuroStat. (2019). *Unemployment statistics*. Retrieved from ec.europa.eu/eurostat: https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Longer-term_unemployment_trends

FinansPara. (2018). *Kredi derecelendirme kuruluşları nedir? Etkileri nelerdir?* Retrieved from finanspara.com: https://www.finanspara.com/kredi-derecelendirme-kuruluslari-nedir-etkileri-nelerdir/

Focus Economics. (2018). *Policy Interest Rate*. Retrieved from focus-economics.com: https://www.focus-economics.com/economic-indicator/policy-interest-rate

Glance, N. A. (2009). *Gross Domestic Product (GDP).* Retrieved from oecd.org: http://www.oecd.org/berlin/44681640.pdf

Global Daily News. (2018, 5 11). *Turkish president slams interest lobby, credit agencies*. Retrieved from globaldailynews.com: https://www.globaldailynews.com/turkey/turkish-president-slams-interest-lobby-credit-agencies/

Groebner, D. F., Shannon, P. W., Fry, P. C., & Smith, K. D. (2007). *Business Statistics A Decision Making Approach.* Prentice Hall.

Hayes, A. (2019, 7 11). *Average Annual Growth Rate – AAGR Definition*. Retrieved from investopedia.com: https://www.investopedia.com/terms/a/aagr.asp

Iktisatkolik. (2016, 8 16). *1970-1990 Yillari Arasinda Türkiye Ekonomisi*. Retrieved from iktisatkolik.wordpress.com: https://iktisatkolik.wordpress.com/2016/08/16/1970-1990-yillari-arasinda-turkiye-ekonomisi/

Intelligent Economist. (2019). *What is Economic Growth*. Retrieved from intelligenteconomist.com: https://www.intelligenteconomist.com/economic-growth/

International Labour Organization (ILO). (2019, 3). *Unemployment Rate*. Retrieved from ilo.org: https://www.ilo.org/ilostat-files/Documents/description_UR_EN.pdf

International Trade Center. (2017). *ITC-UNWTO National Tourism.* Switzerland: ITC-UNWTO.

Investopedia. (2019, 5 28). *investopedia.com*. Retrieved from Interest Rate: https://www.investopedia.com/terms/i/interestrate.asp

Lepenies, P. (2016). The Power of a Single Number: A Political History of GDP. In P. Lepenies, *The power of a single number : A political history of GDP*. Columbia University Press.

LumenLearning. (2019). *Boundless Economics, Comparing Real and Nominal GDP*. Retrieved from lumenlearning.com: https://courses.lumenlearning.com/boundless-economics/chapter/comparing-real-and-nominal-gdp/

Macrotrends. (2019). *Federal Funds Rate - 62 Year Historical Chart*. Retrieved from macrotrends.net: https://www.macrotrends.net/2015/fed-funds-rate-historical-chart

Majaski, C. (2019, 4 14). *investopedia.com*. Retrieved from Producer Price Index – PPI: https://www.investopedia.com/terms/p/ppi.asp

McCoy, F. (2015). Monetary Economics Exchange Rate Regimes.

Minister of Culture and Tourism. (2019). *Tourism Receipts*. Retrieved from kulturturizm.gov.tr: http://yigm.kulturturizm.gov.tr/Eklenti/63228,turizm-geliri-2016-2019-3-aylikxls.xls?0

OECD. (2013). *OECD Work on Statistics*. Retrieved from oecd.org: http://www.oecd.org/sdd/OECD-Work-on-Statistics-brochure2013.pdf

OECD. (2019). *OECD*. Retrieved from oecd.org: http://www.oecd.org/

OECD Data. (2019). *Exchange rates*. Retrieved from data.oecd.org: https://data.oecd.org/conversion/exchange-rates.htm

OECD Data. (2019). *Gross domestic product (GDP)*. Retrieved from data.oecd.org: https://data.oecd.org/gdp/gross-domestic-product-gdp.htm

OECD Data. (2019). *Gross domestic product (GDP)*. Retrieved from data.oecd.org: https://data.oecd.org/gdp/gross-domestic-product-gdp.htm

OECD Data. (2019). *Inflation (CPI)*. Retrieved from data.oecd.org: https://data.oecd.org/price/inflation-cpi.htm

Pettinger, T. (2017, 7 28). *Economic Growth*. Retrieved from economicshelp.org: https://www.economicshelp.org/macroeconomics/economic-growth/

Rama-Poccia, M. (2018, 12 13). *What Is Balance of Trade and Why Is It Important for 2019?* Retrieved from thestreet.com: https://www.thestreet.com/politics/what-is-balance-of-trade-bot-14804888

Reuters. (2019, 7 6). *Turkey's President Removes Head of Central Bank*. Retrieved from nytimes.com: https://www.nytimes.com/2019/07/06/business/erdogan-removes-turkey-governor-central-bank.html

Romer, P. (2016, 4 13). *The Deep Structure of Economic Growth*. Retrieved from paulromer.net: https://paulromer.net/economic-growth/index.html

S&P Global. (2018). *S&P Dow Jones Indices*. Retrieved from spice-indices.com: https://www.spice-indices.com/idpfiles/spice-assets/resources/public/documents/725551_spdji2018countryclassificationconsultation6.13.18.pdf

The Council on Foreign Relations. (2015, 2 19). *The Credit Rating Controversy*. Retrieved from cfr.org: https://www.cfr.org/backgrounder/credit-rating-controversy

The Economic Times. (2019). *Repo Rate*. Retrieved from economictimes.indiatimes.com: https://economictimes.indiatimes.com/definition/repo-rate

The World Bank Data. (2019). *Unemployment*. Retrieved from data.worldbank.org: https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS

Turkish Exporters Assembly. (2019). *Export Numbers*. Retrieved from tim.org.tr: https://www.tim.org.tr/tr/ihracat-rakamlari.html

TurkStat. (2019). *Foreign Trade by Years, 1923-2018*. Retrieved from tuik.gov.tr: http://www.tuik.gov.tr/PreIstatistikTablo.do?istab_id=621

TurkStat. (2019). *Turkish Statistical Institue*. Retrieved from turkstat.gov.tr: http://www.turkstat.gov.tr

Weltman, J. (2019, 5 15). *Risk experts consistently proved right on Turkey*. Retrieved from euromoney.com: https://www.euromoney.com/article/b1fffl19stqgh8/risk-experts-consistently-proved-right-on-turkey

Wikipedia. (2019). *Developing Country*. Retrieved from wikipedia.org: https://en.wikipedia.org/wiki/Developing_country

Wikipedia. (2019). *Gross Domestic Product*. Retrieved from wikipedia.org: https://en.wikipedia.org/wiki/Gross_domestic_product#cite_ref-kuznets_11-0

Yalınkılıç, F. (2018, 6 19). *5 Charts That Show Turkey's Capital Flight Problem Is Getting Worse*. Retrieved from bloomberg.com: https://www.bloomberg.com/news/articles/2018-06-19/turkey-s-capital-flight-problem-is-getting-worse-in-5-charts

9. Appendix

GDP of Turkey

Table 10: GDP - Million US dollars (1970 – 2018) - Turkey

Source: Aggregate National Accounts, SNA 2008 (or SNA 1993) – based on nominal GDP

No	Year	Total GDP (Million US dollars)	No	Year	Total GDP (Million US dollars)
1	1970	62720	26	1995	602825
2	1971	69568	27	1996	655872
3	1972	77965	28	1997	716895
4	1973	84920	29	1998	557853
5	1974	97739	30	1999	545464
6	1975	114453	31	2000	606080
7	1976	133386	32	2001	591540
8	1977	146498	33	2002	607794
9	1978	159162	34	2003	634715
10	1979	171290	35	2004	727743
11	1980	182194	36	2005	807227
12	1981	209117	37	2006	936569
13	1982	229947	38	2007	1033244
14	1983	250828	39	2008	1130487
15	1984	277320	40	2009	1104759
16	1985	298223	41	2010	1260360
17	1986	325572	42	2011	1443296
18	1987	365264	43	2012	1539111
19	1988	386166	44	2013	1690856
20	1989	402315	45	2014	1851026
21	1990	456004	46	2015	2012362
22	1991	475793	47	2016	2087370
23	1992	515758	48	2017	2261007
24	1993	570437	49	2018	2296105
25	1994	550833			

(OECD Data, 2019)

GDP of OECD-35

Table 11: GDP - Million US dollars (1970 – 2018) – OECD-35

Source: Aggregate National Accounts, SNA 2008 (or SNA 1993): Gross domestic product

No	Year	GDP of OECD-35 1970 - 2018 (Million US dollars)	No	Year	GDP of OECD-35 1970 - 2018 (Million US dollars)
1	1970	3186684	26	1995	602825
2	1971	3474603	27	1996	655872
3	1972	3824547	28	1997	716895
4	1973	4286030	29	1998	557853
5	1974	4723818	30	1999	545464
6	1975	5183391	31	2000	606080
7	1976	5736647	32	2001	591540
8	1977	6316118	33	2002	607794
9	1978	7063648	34	2003	634715
10	1979	7947738	35	2004	727743
11	1980	8779679	36	2005	807227
12	1981	9828313	37	2006	936569
13	1982	10448036	38	2007	1033244
14	1983	11179547	39	2008	1130487
15	1984	12134017	40	2009	1104759
16	1985	12985979	41	2010	1260360
17	1986	13641559	42	2011	1443296
18	1987	14496354	43	2012	1539111
19	1988	15690627	44	2013	1690856
20	1989	16919880	45	2014	1851026
21	1990	18087204	46	2015	2012362
22	1991	18979715	47	2016	2087370
23	1992	19857115	48	2017	2261007
24	1993	20623183	49	2018	2296105
25	1994	21705573			

(OECD Data, 2019)

Policy Interest Rates of Turkey

Table 12: CBRT Interest Rates (%) Overnight (O/N) - Turkey

No	Date	Lending	No	Date	Lending	No	Date	Lending
1	20.02.2002	62.00	31	21.07.2006	22.50	61	22.02.2012	11.50
2	14.03.2002	61.00	32	14.09.2007	22.25	62	19.09.2012	10.00
3	08.04.2002	58.00	33	17.10.2007	21.50	63	19.10.2012	9.50
4	30.04.2002	55.00	34	15.11.2007	20.75	64	21.11.2012	9.00
5	05.08.2002	53.00	35	14.12.2007	20.00	65	23.01.2013	8.75
6	11.11.2002	51.00	36	18.01.2008	19.50	66	20.02.2013	8.50
7	25.04.2003	48.00	37	15.02.2008	19.25	67	27.03.2013	7.50
8	04.06.2003	45.00	38	16.05.2008	19.75	68	17.04.2013	7.00
9	16.07.2003	41.00	39	17.06.2008	20.25	69	17.05.2013	6.50
10	06.08.2003	38.00	40	18.07.2008	20.25	70	24.07.2013	7.25
11	18.09.2003	35.00	41	23.10.2008	19.75	71	21.08.2013	7.75
12	15.10.2003	31.00	42	20.11.2008	18.75	72	29.01.2014	12.00
13	05.02.2004	29.00	43	19.12.2008	17.50	73	18.07.2014	12.00
14	17.03.2004	27.00	44	16.01.2009	15.50	74	28.08.2014	11.25
15	08.09.2004	24.00	45	20.02.2009	14.00	75	25.02.2015	10.75
16	20.12.2004	22.00	46	20.03.2009	13.00	76	25.03.2016	10.50
17	11.01.2005	21.00	47	17.04.2009	12.25	77	21.04.2016	10.00
18	09.02.2005	20.50	48	15.05.2009	11.75	78	25.05.2016	9.50
19	09.03.2005	19.50	49	17.06.2009	11.25	79	22.06.2016	9.00
20	11.04.2005	19.00	50	17.07.2009	10.75	80	20.07.2016	8.75
21	10.05.2005	18.50	51	19.08.2009	10.25	81	24.08.2016	8.50
22	09.06.2005	18.25	52	18.09.2009	9.75	82	23.09.2016	8.25
23	11.10.2005	18.00	53	16.10.2009	9.25	83	25.11.2016	8.50
24	09.11.2005	17.75	54	20.11.2009	9.00	84	25.01.2017	9.25
25	09.12.2005	17.50	55	17.09.2010	8.75	85	01.06.2018	16.50
26	02.01.2006	16.50	56	15.10.2010	8.75	86	08.06.2018	19.25
27	28.04.2006	16.25	57	12.11.2010	8.75	87	14.09.2018	24.00
28	08.06.2006	18.00	58	17.12.2010	9.00	88	21.09.2018	25.50
29	26.06.2006	20.25	59	05.08.2011	9.00	87	14.09.2018	24.00
30	28.06.2006	22.25	60	21.10.2011	12.50	88	21.09.2018	25.50

(Central Bank of the Republic of Turkey, 2019)

Table 13: 1 Week Repo - Turkey

No	Date	Lending
1	20.05.2010	7.00
2	17.12.2010	6.50
3	21.01.2011	6.25
4	05.08.2011	5.75
5	19.12.2012	5.50
6	17.04.2013	5,00
7	17.05.2013	4.50
8	29.01.2014	10.00
9	23.05.2014	9.50
10	25.06.2014	8.75
11	18.07.2014	8.25
12	21.01.2015	7.75
13	25.02.2015	7.50
14	25.11.2016	8.00
15	01.06.2018	16.50
16	08.06.2018	17.75
17	14.09.2018	24.00

(Central Bank of the Republic of Turkey, 2019)

Inflation Rates of Turkey

Table 14: Inflation (CPI) Total, Annual growth rate (%) 1959 – 2018

No	Year	Inflation Rate	No	Year	Inflation Rate
1	1959	26.65	31	1989	63.27
2	1960	5.66	32	1990	60.30
3	1961	3.17	33	1991	65.98
4	1962	3.89	34	1992	70.08
5	1963	6.36	35	1993	66.09
6	1964	1.12	36	1994	105.22
7	1965	4.56	37	1995	89.11
8	1966	8.47	38	1996	80.41
9	1967	13.97	39	1997	85.67
10	1968	6.05	40	1998	84.64
11	1969	4.92	41	1999	64.87
12	1970	7.92	42	2000	54.92
13	1971	19.01	43	2001	54.40
14	1972	15.42	44	2002	44.96
15	1973	13.94	45	2003	21.60
16	1974	23.90	46	2004	8.60
17	1975	21.23	47	2005	8.18
18	1976	17.46	48	2006	9.60
19	1977	25.99	49	2007	8.76
20	1978	61.90	50	2008	10.44
21	1979	63.54	51	2009	6.25
22	1980	94.26	52	2010	8.57
23	1981	37.61	53	2011	6.47
24	1982	29.14	54	2012	8.89
25	1983	31.39	55	2013	7.49
26	1984	48.39	56	2014	8.85
27	1985	44.96	57	2015	7.67
28	1986	34.61	58	2016	7.78
29	1987	38.86	59	2017	11.14
30	1988	68.81	60	2018	16.33

(OECD Data, 2019)

Exchange Rates

Table 15: TR lira / US dollar, 1989 – 2018

No	Year	Exchange Rates (TRY/USD)
1	1989	0.002
2	1990	0.003
3	1991	0.004
4	1992	0.01
5	1993	0.01
6	1994	0.03
7	1995	0.05
8	1996	0.08
9	1997	0.15
10	1998	0.26
11	1999	0.42
12	2000	0.63
13	2001	1.23
14	2002	1.51
15	2003	1.50
16	2004	1.43
17	2005	1.34
18	2006	1.43
19	2007	1.30
20	2008	1.30
21	2009	1.55
22	2010	1.50
23	2011	1.67
24	2012	1.80
25	2013	1.90
26	2014	2.19
27	2015	2.72
28	2016	3.02
29	2017	3.65
30	2018	4.83

(OECD Data, 2019)

Table 16: National Currencies (of Brazil, India, Mexico, Turkey) / US dollar, 1989 – 2018

Years	BRA	IND	MEX	TUR
2012	1.95	53.44	13.17	1.80
2013	2.16	58.60	12.77	1.90
2014	2.35	61.03	13.29	2.19
2015	3.33	64.15	15.85	2.72
2016	3.49	67.20	18.66	3.02
2017	3.19	65.12	18.93	3.65
2018	3.65	68.39	19.24	4.83

(OECD Data, 2019)

Balance of Trade

Table 17: Foreign trade by years, 1923-1954 (Value: Thousand US $) - Turkey

No	Years	Export	Import	Balance of Trade	Proportion of imports covered by exports (%)	Volume of Foreign Trade
1	1923	50 790	86 872	- 36 082	58.5	137 662
2	1924	82 435	100 462	- 18 027	82.1	182 897
3	1925	102 700	128 953	- 26 253	79.6	231 653
4	1926	96 437	121 411	- 24 974	79.4	217 848
5	1927	80 749	107 752	- 27 003	74.9	188 501
6	1928	88 278	113 710	- 25 432	77.6	201 988
7	1929	74 827	123 558	- 48 731	60.6	198 385
8	1930	71 380	69 540	1 840	102.6	140 920
9	1931	60 226	59 935	291	100.5	120 161
10	1932	47 972	40 718	7 254	117.8	88 690
11	1933	58 065	45 091	12 974	128.8	103 156
12	1934	73 007	68 761	4 246	106.2	141 768
13	1935	76 232	70 635	5 597	107.9	146 867
14	1936	93 670	73 619	20 051	127.2	167 289
15	1937	109 225	90 540	18 685	120.6	199 765
16	1938	115 019	118 899	- 3 880	96.7	233 918
17	1939	99 647	92 498	7 149	107.7	192 145
18	1940	80 904	50 035	30 869	161.7	130 939
19	1941	91 056	55 349	35 707	164.5	146 405
20	1942	126 115	112 879	13 236	111.7	238 994
21	1943	196 734	155 340	41 394	126.6	352 074
22	1944	177 952	126 230	51 722	141.0	304 182
23	1945	168 264	96 969	71 295	173.5	265 233
24	1946	214 580	118 889	95 691	180.5	333 469
25	1947	223 301	244 644	- 21 343	91.3	467 945
26	1948	196 799	275 053	- 78 254	71.5	471 852
27	1949	247 825	290 220	- 42 395	85.4	538 045
28	1950	263 424	285 664	- 22 240	92.2	549 088
29	1951	314 082	402 086	- 88 004	78.1	716 168
30	1952	362 914	555 920	- 193 006	65.3	918 834
31	1953	396 061	532 533	- 136 472	74.4	928 594
32	1954	334 924	478 359	- 143 435	70.0	813 283

(TurkStat, Foreign Trade by Years, 1923-2018, 2019)

Table 18: Foreign trade by years, 1955-1986 (Value: Thousand US $) - Turkey

No	Years	Export	Import	Balance of Trade	Proportion of imports covered by exports (%)	Volume of Foreign Trade
33	1955	313 346	497 637	- 184 291	63.0	810 983
34	1956	304 990	407 340	- 102 350	74.9	712 330
35	1957	345 217	397 125	- 51 908	86.9	742 342
36	1958	247 271	315 098	- 67 827	78.5	562 369
37	1959	353 799	469 982	- 116 183	75.3	823 781
38	1960	320 731	468 186	- 147 455	68.5	788 917
39	1961	346 740	507 205	- 160 465	68.4	853 945
40	1962	381 197	619 447	- 238 250	61.5	1 000 644
41	1963	368 087	687 616	- 319 529	53.5	1 055 703
42	1964	410 771	537 229	- 126 458	76.5	948 000
43	1965	463 738	571 953	- 108 215	81.1	1 035 691
44	1966	490 508	718 269	- 227 761	68.3	1 208 777
45	1967	522 334	684 669	- 162 335	76.3	1 207 003
46	1968	496 419	763 659	- 267 240	65.0	1 260 078
47	1969	536 834	801 236	- 264 403	67.0	1 338 070
48	1970	588 476	947 604	- 359 128	62.1	1 536 081
49	1971	676 602	1 170 840	- 494 239	57.8	1 847 442
50	1972	884 969	1 562 550	- 677 581	56.6	2 447 519
51	1973	1 317 083	2 086 216	- 769 133	63.1	3 403 299
52	1974	1 532 182	3 777 501	-2 245 319	40.6	5 309 683
53	1975	1 401 075	4 738 558	-3 337 483	29.6	6 139 633
54	1976	1 960 214	5 128 647	-3 168 433	38.2	7 088 862
55	1977	1 753 026	5 796 278	-4 043 252	30.2	7 549 304
56	1978	2 288 163	4 599 025	-2 310 862	49.8	6 887 187
57	1979	2 261 195	5 069 432	-2 808 236	44.6	7 330 627
58	1980	2 910 122	7 909 364	-4 999 242	36.8	10 819 486
59	1981	4 702 934	8 933 374	-4 230 439	52.6	13 636 308
60	1982	5 745 973	8 842 665	-3 096 692	65.0	14 588 639
61	1983	5 727 834	9 235 002	-3 507 168	62.0	14 962 836
62	1984	7 133 604	10 757 032	-3 623 429	66.3	17 890 636
63	1985	7 958 010	11 343 376	-3 385 367	70.2	19 301 386
64	1986	7 456 726	11 104 771	-3 648 046	67.1	18 561 497

(TurkStat, Foreign Trade by Years, 1923-2018, 2019)

Table 19: Foreign trade by years, 1987-2018 (Value: Thousand US $) - Turkey

No	Years	Export	Import	Balance of Trade	Proportion of imports covered by exports (%)	Volume of Foreign Trade
65	1987	10 190 049	14 157 807	-3 967 757	72.0	24 347 856
66	1988	11 662 024	14 335 398	-2 673 374	81.4	25 997 422
67	1989	11 624 692	15 792 143	-4 167 451	73.6	27 416 835
68	1990	12 959 288	22 302 126	-9 342 838	58.1	35 261 413
69	1991	13 593 462	21 047 014	-7 453 552	64.6	34 640 476
70	1992	14 714 629	22 871 055	-8 156 426	64.3	37 585 684
71	1993	15 345 067	29 428 370	-14 083 303	52.1	44 773 436
72	1994	18 105 872	23 270 019	-5 164 147	77.8	41 375 891
73	1995	21 637 041	35 709 011	-14 071 970	60.6	57 346 052
74	1996	23 224 465	43 626 642	-20 402 178	53.2	66 851 107
75	1997	26 261 072	48 558 721	-22 297 649	54.1	74 819 792
76	1998	26 973 952	45 921 392	-18 947 440	58.7	72 895 344
77	1999	26 587 225	40 671 272	-14 084 047	65.4	67 258 497
78	2000	27 774 906	54 502 821	-26 727 914	51.0	82 277 727
79	2001	31 334 216	41 399 083	-10 064 867	75.7	72 733 299
80	2002	36 059 089	51 553 797	-15 494 708	69.9	87 612 886
81	2003	47 252 836	69 339 692	-22 086 856	68.1	116 592 528
82	2004	63 167 153	97 539 766	-34 372 613	64.8	160 706 919
83	2005	73 476 408	116 774 151	-43 297 743	62.9	190 250 559
84	2006	85 534 676	139 576 174	-54 041 499	61.3	225 110 850
85	2007	107 271 750	170 062 715	-62 790 965	63.1	277 334 464
86	2008	132 027 196	201 963 574	-69 936 378	65.4	333 990 770
87	2009	102 142 613	140 928 421	-38 785 809	72.5	243 071 034
88	2010	113 883 219	185 544 332	-71 661 113	61.4	299 427 551
89	2011	134 906 869	240 841 676	-105 934 807	56.0	375 748 545
90	2012	152 461 737	236 545 141	-84 083 404	64.5	389 006 877
91	2013	151 802 637	251 661 250	-99 858 613	60.3	403 463 887
92	2014	157 610 158	242 177 117	-84 566 959	65.1	399 787 275
93	2015	143 838 871	207 234 359	-63 395 487	69.4	351 073 230
94	2016	142 529 584	198 618 235	-56 088 651	71.8	341 147 819
95	2017	156 992 940	233 799 651	-76 806 711	67.1	390 792 592
96	2018	167 920 821	223 047 178	-55 126 357	75.3	390 967 999

(TurkStat, Foreign Trade by Years, 1923-2018, 2019)

Export Values

Table 20: Foreign trade according to sectors in 2018 (Value: Thousand US $)

Sector	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Agriculture	5724341	5269514	5092384	6559370	22645609
Industry	33281863	33539573	33388546	36115315	136325297
Mining	1102430	1178964	1092650	1187617	4561662
Total	40108634	39988052	39573580	43862302	163532569

(Turkish Exporters Assembly, 2019)

Tourism Receipts

Table 21: Tourism Receipts

Months	2016	2017	2018
January	1412	1144	1511
February	1189	992	1301
March	1466	1234	1613
April	1353	1372	1810
May	1838	1905	2422
June	1790	2136	2813
July	2391	3469	3535
August	3098	4270	4281
September	2788	3653	3686
October	2310	3013	3318
November	1331	1667	1795
December	1142	1430	1428

(Minister of Culture and Tourism, 2019)

Unemployment Rate

Table 22: Unemployment of Turkey, total (% of total labour force) (modeled ILO estimate)

No	Year	Unemployment Rate (%)
1	1991	8.21
2	1992	8.51
3	1993	8.96
4	1994	8.58
5	1995	7.64
6	1996	6.63
7	1997	6.84
8	1998	6.89
9	1999	7.69
10	2000	6.49
11	2001	8.38
12	2002	10.36
13	2003	10.54
14	2004	10.84
15	2005	10.64
16	2006	8.72
17	2007	8.87
18	2008	9.71
19	2009	12.55
20	2010	10.66
21	2011	8.80
22	2012	8.15
23	2013	8.73
24	2014	9.88
25	2015	10.24
26	2016	10.84
27	2017	10.82
28	2018	10.90

International Labour Organization, ILOSTAT database. Data retrieved in April 2019.

(The World Bank Data, 2019)

Table 23: Unemployment rate 2008-2018 (%) - Selected Countries by EuroStat

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EU-28	7.00	9.00	9.60	9.70	10.50	10.90	10.20	9.40	8.60	7.60	6.80
Euro area	7.60	9.60	10.20	10.20	11.40	12.00	11.60	10.90	10.00	9.10	8.20
Belgium	7.00	7.90	8.30	7.20	7.60	8.40	8.50	8.50	7.80	7.10	6.00
Bulgaria	5.60	6.80	10.30	11.30	12.30	13.00	11.40	9.20	7.60	6.20	5.20
Czech Republic	4.40	6.70	7.30	6.70	7.00	7.00	6.10	5.10	4.00	2.90	2.20
Denmark	3.40	6.00	7.50	7.60	7.50	7.00	6.60	6.20	6.20	5.70	5.00
Germany	7.40	7.60	7.00	5.80	5.40	5.20	5.00	4.60	4.10	3.80	3.40
Estonia	5.50	13.50	16.70	12.30	10.00	8.60	7.40	6.20	6.80	5.80	5.40
Ireland	6.80	12.60	14.60	15.40	15.50	13.80	11.90	10.00	8.40	6.70	5.80
Greece	7.80	9.60	12.70	17.90	24.50	27.50	26.50	24.90	23.60	21.50	19.30
Spain	11.30	17.90	19.90	21.40	24.80	26.10	24.50	22.10	19.60	17.20	15.30
France	7.40	9.10	9.30	9.20	9.80	10.30	10.30	10.40	10.10	9.40	9.10
Croatia	8.60	9.30	11.80	13.70	15.80	17.40	17.20	16.10	13.40	11.00	8.50
Italy	6.70	7.70	8.40	8.40	10.70	12.10	12.70	11.90	11.70	11.20	10.60
Cyprus	3.70	5.40	6.30	7.90	11.90	15.90	16.10	15.00	13.00	11.10	8.40
Latvia	7.70	17.50	19.50	16.20	15.00	11.90	10.80	9.90	9.60	8.70	7.40
Lithuania	5.80	13.80	17.80	15.40	13.40	11.80	10.70	9.10	7.90	7.10	6.20
Luxembourg	4.90	5.10	4.60	4.80	5.10	5.90	6.00	6.50	6.30	5.60	5.40
Hungary	7.80	10.00	11.20	11.00	11.00	10.20	7.70	6.80	5.10	4.20	3.70
Malta	6.00	6.90	6.80	6.40	6.20	6.10	5.70	5.40	4.70	4.00	3.70
Netherlands	3.70	4.40	5.00	5.00	5.80	7.30	7.40	6.90	6.00	4.90	3.80
Austria	4.10	5.30	4.80	4.60	4.90	5.40	5.60	5.70	6.00	5.50	4.90
Poland	7.10	8.10	9.70	9.70	10.10	10.30	9.00	7.50	6.20	4.90	3.90
Portugal	8.80	10.70	12.00	12.90	15.80	16.40	14.10	12.60	11.20	9.00	7.00
Romania	5.60	6.50	7.00	7.20	6.80	7.10	6.80	6.80	5.90	4.90	4.20
Slovenia	4.40	5.90	7.30	8.20	8.90	10.10	9.70	9.00	8.00	6.60	5.10
Slovakia	9.60	12.10	14.50	13.70	14.00	14.20	13.20	11.50	9.70	8.10	6.50
Finland	6.40	8.20	8.40	7.80	7.70	8.20	8.70	9.40	8.80	8.60	7.40
Sweden	6.20	8.30	8.60	7.80	8.00	8.00	7.90	7.40	6.90	6.70	6.30
U.K.	5.60	7.60	7.80	8.10	7.90	7.50	6.10	5.30	4.80	4.40	4.00
Iceland	3.00	7.20	7.60	7.10	6.00	5.40	5.00	4.00	3.00	2.80	2.70
Norway	2.70	3.30	3.70	3.40	3.30	3.80	3.60	4.50	4.80	4.20	3.90
Turkey	10.00	13.00	11.10	9.10	8.40	9.00	9.90	10.30	10.90	10.90	11.00
United States	5.80	9.30	9.60	8.90	8.10	7.40	6.20	5.30	4.90	4.40	3.90
Japan	4.00	5.10	5.00	4.60	4.30	4.00	3.60	3.40	3.10	2.80	2.40

(EuroStat, 2019)

Table 24: Moody's Credit View of Turkey

Year	Grade
2002	B1
2003	B1
2004	B1
2005	BA3
2006	BA3
2007	BA3
2008	BA3
2009	BA3
2010	BA2
2011	BA2
2012	BA1
2013	BAA3
2014	BAA3
2015	BAA3
2016	BA1
2017	BA1
2018	BA3

Redesigned according to the last report results of each year. The previous year's grades are used where is no new report.

(Country Economy, 2019)

Univerzita Hradec Králové
Faculty of Informatics and Management
Academic Year:

Study Programme: Systems Engineering and Inform
Form: Full
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TOPIC IN CZECH:

Economic Dynamics in Turkey in Public Data View

TOPIC IN ENGLISH:

Vývoj ekonomiky Turecka na základě dat veřejných statistik

SUPERVISOR:

Prof. RNDr. Hana Skalská, CSc. – KIKM

RESEARCH PLAN:

- Review of the corresponding literature related to the characteristics and measures of economic dynamics.

- Description of selected characteristics and measures of economics dynamic.

- Selection of data resources, collecting public data. Data visualization, decision about analytical methods and tools, data analy

- Quantification of evidence, description of results, interpreting and explanation of findings.

- Summary and conclusion.

List of recommended literature:

Armstrong J. S.: Principles of Forecasting.

Makridakis S. et al: Forecasting. Methods and Application.

Web pages of Statistical & Research Offices:

- **Economic Development Fondation (www.ikv.org.tr)**
- **Turkish Statistical Institute (www.turkstat.gov.tr)**
- **OECD (www.oecd.org)**
- **Statistical Office of the European Union (www.ec.europa.eu/eurostat)**

Public data resources.

Student's signature: ..... **Date:** 5.11.2018

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