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**DETERMINANTS OF RESIDENTIAL REAL ESTATE PRICES IN TURKEY**

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## **FOREWORD**

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**Non Scotts Dze TEM**

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## **ABBREVIATIONS**

<b>AFI</b>	: Analistas Financieros Internacionales
<b>APR</b>	: Average Parentage Rate
<b>CPI</b>	: Consumer Price Index
<b>DV</b>	: Dependent Variable.
<b>GDP</b>	: Gross Domestic Product
<b>EU</b>	: European Union
<b>FDI</b>	: Foreign Direct Investment
<b>IV</b>	: Independent Variables
<b>LMS</b>	: Level of Money Supply
<b>LODER</b>	: Logistics Association Turkey
<b>OECD</b>	: Organisation for Economic Co-operation and Development
<b>SPSS</b>	: Statistics Package for Social Sciences
<b>TCMB</b>	: Central Bank of Turkey
<b>TL</b>	: Turkish Lira
<b>SPO</b>	: State Planning Organization
<b>TOKI</b>	: Turkey's Government Housing Agency.
<b>TURKSTAT</b>	: Turkish Statistical Institute
<b>USA</b>	: United States of America
<b>USD</b>	: United States Dollars
<b>UK</b>	: United Kingdom

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## **DETERMINANTS OF RESIDENTIAL REAL ESTATE PRICES IN TURKEY**

### **ABSTRACT**

The real estate market is a major determinant of economic growth in many countries. It has experienced a drastic growth over the decades in many countries. Real estate market just like any other market is influenced by the forces of demand and supply where price is a key attribute. However, price is not homogenous as it subjected to fluctuations. The Turkish real estate market over the last 3 decades has experienced a drastic growth and it accounts for 19.5% of the total GDP in 2016. In order to understand the forces behind the price fluctuations we need to understand the factors that determine the prices of residential real estate in Turkey. This study analyses the determinants of residential real estate prices in Turkey. Monthly, quarterly and annual secondary data was collected for a period of 7 years from 2010 to 2016 from publications of government and financial institutions. Descriptive statistics was conducted to describe the basic features of the data in this study. Finally with the help of SPSS a multiple regression and backward elimination was carried out. The results shows that there is strong negative relation between Interest rate and house prices, weak negative relationship between house prices and inflation rate, strong positive relationship between house prices and population and a strong relationship between GDP and house prices. A multiple regression analysis shows the relationship between house prices and its determinants. The results from the multiple regressions revealed the same results, but it equally is statistically significant, another regression analysis this time called backward elimination is carried which consist of eliminating the insignificant variable of interest rate. This implies the real estate market in Turkey is significantly stable.

**Keywords.** *Real Estate Market, House Price Index, Interest Rate, CPI Inflation, GDP, Population, Multivariate Regression, Backward Elimination*

## TÜRKİYE'DE KONUT GAYRİMENKUL FİYATLARININ BELİRLENMESİ

### ÖZET

Gayrimenkul piyasası birçok ülkede ekonomik büyümenin önemli bir belirleyicisidir. Birçok ülkede on yıllar boyunca ciddi bir büyüme yaşamıştır. Emlak piyasası diğer pazarlar gibi fiyatın önemli bir özelliği olan talep ve arz güçleri tarafından etkilenir. Bununla birlikte, dalgalanmalara maruz kaldığı için fiyat homojen değildir. Son otuz yıldaki Türk gayrimenkul piyasası hızlı bir gelişme göstermiş ve 2016 yılında toplam GSYİH'nın% 19.5'ini oluşturmaktadır. Fiyat dalgalanmalarının arkasındaki güçleri anlamak için konut fiyatlarını belirleyen faktörleri anlamak gerekir. Bu çalışma Türkiye'de konut emlak fiyatlarının belirleyicilerini analiz etmektedir. Aylık, üç aylık ve yıllık ikincil veriler, hükümet ve finansal kurumların yayınlarından 2010-2016 yılları arasında 7 yıllık bir süre için toplanmıştır. Bu çalışmada verilerin temel özelliklerini tanımlamak için betimsel istatistikler yapılmıştır. Son olarak SPSS yardımıyla regresyon analizi yapılmıştır. Sonuçlar göstermektedir ki, ev fiyatları ile enflasyon oranı arasındaki zayıf negatif ilişki, konut fiyatları ile nüfus arasındaki güçlü olumlu ilişki ve GSYİH ile konut fiyatları bileşenleri arasındaki güçlü ilişki vardır. Çoklu regresyon analizi, konut fiyatları ile konut fiyatları arasındaki ilişkiyi göstermektedir. Çoklu regresyon sonucunda benzer sonuçlar ortaya çıkmış ve istatistiksel olarak anlamlı bir fark bulunmuştur. Sonrasında faiz oranındaki önemli olmayan değişkenliğin ortadan kaldırılmasına dayanan bir başka regresyon analizi yapılmıştır. Bu, Türkiye'deki emlak piyasasının belirgin bir şekilde istikrarlı olduğuna işaret ediyor.

**Anahtar kelimeler.** *Gayrimenkul Piyasası, Konut Fiyat Endeksi, Faiz Oranı, TÜFE Enflasyonu, GSYİH, Nüfus, Çok Değişkenli Regresyon, Karl Pearson Korelasyonu, Geriye Elenme*

## 1. INTRODUCTION

Real estate market in Turkey is a key sector of the economy because it is of primary interest to the private investors and to the government. This sector alone accounts for almost 20 % of the GDP in 2016 in Turkey. The real estate market like any other commodity market is governed principally by the forces of demand and supply and the key attribute is the price. Real Estate Market is defined as land and all the properties on it be it movable and immovable, such as buildings and all the natural resources on it. According to Kimmons (2017), there are 3 types of real estate properties that is vacant land, residential properties, and commercial properties. Based on the Real estate market, there are principal two types of real estate which are the residential real estate market or housing market and commercial real estate. Where the residential real estate market or housing market is the sales of landed properties or rentals to individuals and families for daily living and commercial real estate is that for business purposes. Turkey is an emerging economy with high rate of urbanization since 1950's and an increase in the industrialization level. There is a high rate of rural-urban migration which has led to the development of major cities like Istanbul. The Turkish real estate market has developed so rapidly over the last 3 decades, and its country accounts almost 20 % of the GDP in 2016 (Deloitte, 2013)

Turkey's economy is ranked 17th in the world, and in Europe, it is the 6<sup>th</sup> with an enormous GDP of 786 billion USD in 2016, and real estate contributing 19.5 %. Many factors account for the booming of the real estate market in Turkey over the past decades amongst which are Foreign Direct Investment FDI, FDI inflow in Turkey stands at 12.5 b USD and the real estate takes 1.6 billion USD of FDI which is 12.8 % of total FDI (Deloitte,2013).

Turkish real estate market regrouped into various categories which are, Residential/Housing Real Estate Market, Office Real Estate Market, Retail Real Estate Market, Logistic Real Estate Market and Hotel Real Estate Market. The factor here is

the price of the property, but the price on itself can be determined by many factors which are the interest rate, inflation rate, population and supply of money in the economy and the GDP of that particular economy.

The major real estate market is the residential market or the housing market. This is the backbone of the real estate market sector in Turkey which comprises properties purchased by household mostly for housing purposes. The demand for houses has led to the growth of this sector stemming from the increase in population. In 2013, housing development administration of Turkey constructed over 620.000 houses in many major cities and town around Turkey. By the end of the year 2008, the total number of houses in Turkey was approximately 16.8 million apartment units (Deloitte 2016).

The price of residential real estate in Turkey during the period of our research from 2010 to 2016 is determined by many exogenous factors. These factors are known as the determinants and include interest rate, inflation rate, GDP, supply of money and the population of the country. Interest rate is a major determinant of residential real estate prices in that this rate can either reduced or increased the residential real estate prices, but the assertion of this statement will be determined later in the subsequent chapters. Also, inflation rate can determined the house prices either by increasing or reducing the house prices in Turkey but this will be determined in detail in the later chapters. More so, GDP is also a main determinant in the prices of real estate market but the extent of this statement be it directly or indirectly will be determined in the subsequent chapters. Last but not the least, population is also one of the factors which is considered to play a major role in determining the prices on houses in Turkey However, these determinants can work individually or collectively in determining the house prices in Turkey.

### **1.1. Background of the study**

The real estate market or housing market is the major factor of the economy which has led to economic growth. In Turkey, the real estate market contributes over 20 % of GDP of the Turkish economy. Theoretically, real estate is defined as all properties ranging from land and buildings on this land alongside the natural resources like water, minerals and non-mobile assets of nature as well as interest on these properties. The

efficient real estate market is the by-product of the wise decision making with the right tools, events focusing on lead generated efforts.

The real estate market in Turkey has experienced a dramatic growth rate over the past few decades and it's among the leading real estate markets in the globe. Theoretically, the conditions of the real estate are governed by the forces of demand and supply. Demand refers to the total quantity of product which is desired by the buyer. The first law of demand stipulates that everything being equal, at low prices more of a particular good is demanded. Thus there is an indirect relationship between demand and price. On the contrary, according to (Burnside et al, 2011), more of some goods are being demanded at higher prices. On the other hand supply refers to the total quantity of a product put at the disposal of consumers by the supplier. The law of supply stipulates that everything being equal the higher the prices the higher the quantity supplied. Thus there is a direct relationship between quantity supplied and price. Aggregate supply, therefore, is the sum total of all the goods and services put at the disposal of the consumer in a particular market. Therefore the prices of the housing market or real estate market are governed by the principle of demand and supply.

Just like any other market the idea of uniform prices is not real; therefore the real estate market or housing market is affected by price fluctuations. For instance in the U.S., as a result of price fluctuation, the real estate market faced a subprime crisis because household ended up paying a mortgage amount greater than the property value. According to Burnside et al, the Housing prices are one of the major determinants of the real estate market because prices are a key factor of demand in the market. Demand on its part is being determined by its micro and macro factors. Therefore to understand the development in the residential real estate market, we need to apprehend the factors of demand and supply not leaving out those behind the fluctuations in prices (Burnside et al, 2011).

There is a major difference between the real estate or housing market and another market of goods and services. This arises from the fact that the housing market has a dual function because it's both commodity and investment assets. So in analysing the housing market, it will include both parties. To researchers like Palmquist (1983), the

housing market is different in that it has a heterogeneous structure, that is the structure base characteristics and those based on the building or its location. Also, according to Quigley (1992), there are four factors that make the real estate market different from the others. They include the high cost of supply due to the duration of construction, durability (i.e. the lifespan of the house), heterogeneity (i.e. no two houses are the same in every aspect) and location fixity (i.e. no cannot be displaced). These different features simply show that real estate markets a collection of segmented markets that are connected.

## **1.2. Purpose of the study**

The complexity of the determinants of the real estate market in Turkey demands an efficient research in order to establish the relationship between the determinants of real estate prices and the house prices in Turkey. The purpose of the study is to establish the determinants of residential real estate prices in Turkey and also to know to what extent these determinants can affect the residential real estate prices in Turkey from 2010 to 2016. Therefore main objective of this study is

- To establish the determinants of residential real estate prices in Turkey
- To understand the relationship between the determinants of residential real estate prices in Turkey and the prices of real estate in Turkey.

In order to better understand the purpose of the study the critical questions are

- What are the determinants of residential real estate prices Turkey?
- To what extent can the prices of real estate in Turkey be determined by exogenous variables?

## **1.3. Methodology of the Study**

The study was conducted based on the determinants of residential real estate Prices in Turkey. The major focus is on the factors that determine the residential real estate prices. Interest rates, level of money supply, GDP, population and inflation rates are the Independent variable while residential estate Prices is the dependent variable. The study

used secondary data and with the help of SPSS multiple regression analysis and back elimination was used. Karl Pearson's correlation was equally carried out.

#### **1.4. Data and Source**

Secondary data was collected for a period of 7 years from 2010 to 2016 in Turkey. The Variables in this study include House Price Index (dependent variable), interest rate, inflation rate, GDP and Populations (Independent variable). For the House Price Index, secondary data was collected for the period of 7 years from TCMB. For Interest rate, annual data for the period of 7 years was collected from Fred Economic Data, for Inflation rate secondary data for the period of 7 years was extracted from World Wide Inflation Data. For GDP quarterly data was collected from TurkStat and for Population, annual data for the period of 7 years was obtained from TurkStat.

#### **1.5. Significance of the Study**

To investigate the determinants of residential real estate prices in Istanbul. There is wide literature that already exists about real estate prices, this piece of work is intended to increase the knowledge already known about real estate price determinants which will be beneficial to academicians. Thus it will also serve as a foundation for further research on determinants of prices of real estate; therefore it will increase the literature of real estate prices, especially on the residential level.

This work will benefit both new investors venturing into the real estate market and old investors looking to expand their investments to be informed about the driven forces of market changes in real estate prices thus helping them to make concrete investment decisions. On the households looking to buy and own a residential home, will enlighten them on the forces of demand and supply thus making the best buy decision.

The financial institution both commercial and central will definitely find this work very useful because it will serve in the view of price fluctuation since it affects a long-term evolution of real estate financing. The government and the public sector will also benefit from these studies because it may serve as a base for government policies like taxation, and also help to formulate the best policies which will help in the growth of the

economy. It will also provide a basis for further research in the field. This it will make a contribution to the literature on determinants of residential real estate prices.

New investors or those already in the field of real estate will be able to understand the sector, make better decisions for evaluation and price determination. Individuals seeking to own their own houses will also benefit in understanding the market forces and make the best buy.

Financial institutions will find this study useful with regards to fluctuations in prices since this affects the long-term evolution of real estate financing. The government and regulatory bodies will benefit in knowing how government policies on issues like taxation affect the sector and hence formulate an appropriate regulatory framework for enhancing the growth of the sector

## **1.6. Organization of Chapters**

This research is organized in six chapters. The first chapter presents a general introduction. Chapter 2 brings out the literature review, chapter 3 specifies the methodology used while chapter 4 is based on data analysis and interpretations. And finally chapters 5 and 6 present the research findings, conclusions and recommendations for further studies.

A rundown of the chapters is presented below.

### **1. Introduction**

- Introduction
- Background of the study
- The Purpose of the study
- The Methodology of study
- The Data Collection and Source
- Significance of the study
- Organization of chapters



## 2. Literature Review

- Introduction
- Concepts of the study (Real Estate and Price)
- Theoretical review (Game theory, Hedonic Model of Prices)
- Determinants of Residential Real Estate Prices
- Measures that can be attained to reduce the residential real estate prices.

## 3. Methodology

- Introduction
- Research design
- Research Population
- Source of data
- Data collection
- Data analysis

## 4. Data analysis, results, and interpretation

- Introduction
- Descriptive statistics
  - \*Descriptive statistics for Residential Real Estate Prices
  - \* Descriptive statistics for Interest rate
  - \*Descriptive statistics for CPI Inflation rate
  - \*Descriptive statistics for GDP
  - \*Descriptive statistics for Population
- Inferential Statistics
  - \* Coefficient of Determinants of Residential Real Estate Prices
  - \* Multiply Regression Analysis of Determinants of Residential Real Estate Prices

\* Backward Elimination Analysis of Determinants of Residential Real Estate prices in Turkey.

## 5. Discussions of findings, Summary and recommendations

### Introduction

-Analysis of the findings

-Importance of the study (to the researcher, the organization, the government, university)

-Summary of the Study

-Discussions

-Discussion of Findings

-Discussion in comparison with previous studies

-Contribution of the present study

-Limitations of the study (to researcher)

-Recommendation for future research

-Implication of the study

## 6. Conclusions and Recommendations

-Conclusions

-Recommendations

## **2. LITERATURE REVIEW**

This chapter presents the views of the other authors as per the research objectives of the study. The presentation denoted the author's views concerning the study. This chapter is fundamental because it lay down a path and presents primary work which is needed as a base for this research. After Analysis, this chapter will therefore assist in grounding the study's theoretical and empirical methodologies in this light, the chapter is thus organized in the following manner.

### **2.1. Concepts of the Study**

#### **2.1.1. Real estate**

Real estate is a term used to describe a situation where property consisting of land and the buildings on it along with its natural resources such as crops water and the natural environment among others, it might constitute an item of real property buildings or housing in general. The concept of real estate involves the activity of buying, selling, or renting land, buildings or housing. Residential real estate that contains a single family or multifamily structure that is available for occupation (Case & Shiller, 2003)

It is defined as land and all the properties on it either movable and immovable, such as buildings and all the natural resources on it. According to Kimmons (2017), there are 3 major types of real estate properties that is vacant land, residential properties, and commercial properties. To Real estate market, there are two principal types of real estate markets, which are the housing market and commercial real estate. Housing market is the sales of landed properties or rentals to individuals and families for habitation purposes and while commercial real estate is meant for business purposes. Turkey is an emerging economy with high rate of urbanization since 1950's and an increase in the industrialization level. There is high rate of rural urban migration which has led to the

development of major cities like Istanbul. The real estate market in Turkey has developed so rapidly within the last 3 decades, and it contributes almost 20 % of the GDP.

Turkey economy is a 17<sup>th</sup> largest in the world, and in Europe, it is the 6<sup>th</sup> with an enormous GDP of 786 billion USD, and real estate contributing 19.5 %. Many reasons accounts for the rapid growth of the real estate market in Turkey over the past decades amongst which are Foreign Direct Investment FDI, FDI inflow in Turkey stands at USD 012.5 billion and the real estate takes USD 1.6 billion of FDI which is 12.8 % of total FDI. (Deloit, 2013).

### **Factors That Encourage the Growth of the Real Estate Market In Turkey.**

Many factors ranging from economic, political, and environmental have affected and encouraged the growth of the real estate market in Turkey. These factors will be examined below.

#### **-Turkey's strategic geographical positions between Europe and Asia**

Turkey is situated between 2 continents that is Europe and Asia thus having a link between the 2 continents. Istanbul and Ankara airports are practical route to travel to major cities in Europe, Asia, Middle East and Africa with radius duration of 4 hours direct flight .The location of Turkey has also made it possible for the intersection of trade between 4 continents thus has led to rapid growth of the logistics and warehousing facilities. Turkey particularly Istanbul has a multicultural background stemming from the Ottoman Empire with it young, and high skilled labour force which has made it an attraction for business thus propelling a way for the real estate market (Deloitte, 2013).

#### **\*Population**

The population of Turkey is also a pull factor for the real estate market because high populations mean the need for houses thus booming the real estate market. The population of Turkey stands at 78, 67 Million people in 2015. The population is growing very rapidly, and it is expected to be 88.5 million by 2030, therefore Turkey has a higher growth rate when compared to other European Countries. For example, Germany is expected by 2030 to have a negative growth rate, thus less of 1m people. The growth in

populations shows that Turkey is an emerging economy. According to Turkish Statistic Institute, the population is expected to be 84.2m people by 2023. A majority of this population is found between 15 to 65 years which makes a strong work force (Deloitte, 2013).

Another key factor is the geographical location of Turkey especially Istanbul, demographic advantages and the populations' composition have all led to the rapid growth of the real estate market in Turkey. Geographically Turkey is located between Europe and Asian continents with a huge population of 79,814,871 people in 2016, with a growth rate of 1.35 %, with over 68 % ranging between 15 years to 64 years (Deloitte, 2013).

**\*Turkey had the greatest improvement on Global Real Estate Transparency Index.**

The Global Real Estate Transparency Index, in 2012 carried out a research on 97 real estate market to analyse the performance of real estate investment in regards to their proprietorship. This study shows that Turkey is the most improved market second time on a roll out of the 97 markets. Also the Doing Business Report of 2014 ranked Turkey 69<sup>th</sup> position stemming from the fact that the FDI Law in Turkey meets with international standards set forth in 2003 (Deloitte,2013)..

**\*Ease to buying property In Turkey by foreigners**

The number of real estate properties sold to foreigners in Turkey increased to 31% by 2012 with a value of 2.64 b USD in 2012, in this same year more than 13,000 properties were sold to foreigners. In Turkey having a resident permit is not a condition to buying properties, and vice versa. Most of foreign investors turn to be interested in shopping centres' and offices. According to Association of Real Estate Companies (GYODER), in 2012 the office market is the most active. The government also enacted important rules and regulations like Land Registry Law No. 6302 (Published in the Official Gazette dated 18 May 2012) which amended rules like, annulment of the principle of reciprocity , it also increase the size of immovable properties that can be bought from 2.5 hectares to 30 hectares. Foreigners could purchase land and space be it planned or unplanned, be it agricultural or not. Finally, foreign companies could own real estate in Turkey. (Deloitte, 2013).

## **\*Investment opportunities in Real Estate Sector**

As an emerging economy, the Turkish economy presents the need for infrastructural investment in all the sectors ranging from residential as well as non-residential real estate, power and energy, transportation of all domain. By 2023 Turkey plans to achieve the following targets

### **General Targets**

- . Become among the 10 largest economy in the world.
- . Increased exportation volume to over 500b USD.
- . By increasing export volume from 152 b USD to 500 b USD, will increase the world trade share to 1.46%.
- . Also, construction companies need to set their target basing on the Country's target.

### **INFRASTRUCTURE**

- . Increase high-speed railway length from 888k to 10.000km
- . Turkish State Railways spending plan is 514.9 m TL on creating logistic villages.
- . Government plans on building 16 more logistic centres.

### **Property**

- . Housing Development Administration of Turkey TOKI plans to build 1 million houses for Turkish citizens as part of the 2023 goals.

### **URBANIZATION**

Also, planned to spread urban transformation and regeneration projects to Aegean, Eastern Anatolian regions of Istanbul.

### **TOURISM**

The government is expecting to increase the number of tourists to 50 million by 2023 by creating new facilities like hotel, health facilities, and sport centres to accommodate the tourists.

## **SWOT Analysis of the Real Estate Market in Turkey (Istanbul Investment House 2017)**

Strengths, Weaknesses, Opportunities, and Threats of Real Estate Market in Turkey.

### **Strengths**

- The solid banking system of Turkey
- The recent introduction of the mortgage system
- Involvement of reputable global construction firms

### **Opportunities**

- The demand for houses is higher than supply, showing a growth potential
- Quality of houses has increased to comply with the earthquake regulations
- Increasing needs for residence and plaza buildings
- Slum houses are being demolished and replaced with modern quality as part of the urban renewal

### **Weaknesses**

- High ratio of licensed housing not qualify for the mortgage credit
- Expensive nature of land especially in major cities like Istanbul, Ankara and Antalya etc.

### **Threats**

- The rate of earthquakes in Turkey is very high especially along the Marmara zones like Istanbul, Bodrum.
- Traditional volatility of the sector.

### **The Real Estate Sector in Turkey**

Basically, we shall be talking about the demand and supply in the real estate sector in Turkey, which can be regrouped into

- Housing Market

-Office Real Estate

-Retail Real Estate

-Logistic Real Estate

-Hotel Real Estate

### **\*Residential/Housing Real Estate Market Outlook**

This is the back bone of the real estate market sector in Turkey which comprises properties purchased by household mostly for housing purposes. This is a key part in the sector and is mostly provided by private individuals, public and cooperative. The demand for houses has led to the growth of this sector stemming from the increase in population, urban renewal, natural disasters. The 2001 crisis marked an increase in residential building constructions. By the year 2000 Turkey had a total of 13.6 million houses and 38 % of those houses were constructed with license. Housing increased drastically between 2002 and 2006 in terms of residential units looking at the number of constructions permit issued. From 2002 immediately after the crisis the average per meter square value of certified houses rose from 164 USD to 318 USD. Rural exodus that is the movement of people from rural areas to cities had increased especially towards cities like Istanbul, Ankara, and Izmir. In 2005 77 % of constructed houses were residential. (Deloitte, 2013)

### **\*Retail Market**

Retail market on the other hand is properties which are used for the exchange of consumer goods and services such as shopping centres. There is a permanent growth because of high demand of retail markets in the past years. The % of retail market increased from 28% to 38% from 2002 to 2008.

In 2015 during the last quarter household, final consumption expenditure expanded by 4.7 % at constant price. In the same year, the overall private demand was stronger compared to other figures of the previous years. By the end of 2015, the household final consumption expenditures reached 4.7% at constant price. Also still in 2015 the overall private demand was greater than that of the previous years. According to the Turkish



Council of Shopping Centres, sales per leasable area were approximately 644 TL per Sq. metre. And in 2016 the expenditure rose to 9.7%.

Shopping centre supply reached to 10.5 million sq. metres with the opening of 1 shopping centre, increasing the total number to 356 in Turkey with the release of 2015 population statistic. There is a strong demand from global investors to shopping centre market. 33 % of the average of the total shopping centres inventory belongs to global investors. (Deloitte, 2013).

#### **\* Logistic Market**

JLL report (2015) shows that Turkey is one of the Countries in Europe with an emerging logistic market because of its strategic position linking 3 continents. According to LODER, the logistic market in Turkey is estimated to reach 108- 140 bn USD in 2017. The major logistics markets in Turkey are located at the Marmara region precisely in Kocaeli and Istanbul. In Istanbul we can find them in places like Hamidikoy, Esenyurt, Tuza, Gebze, Kocaeli. This market depends solely on the volume of sales which is indirectly affected by macroeconomics and microeconomics variables. Recently occupier demand has been concentrated on two warehouse types including 500-to 3000 sq. metres city – centre distribution warehouses and 30,000 to 50,000sqm warehouses for merging trend in core logistics locations (Deloitte, 2013)

#### **2.1.2. Price**

Price is defined as the amount of payment or compensation that is provided by one party to another for an exchange of the goods and service. In modern economics, prices are seen as units of some form of currency for the commodities expressed in currency of the commodity. The prices could be quoted as quantities of other goods or services this sort of barter exchange is rarely seen (Herring & Wachter, 2003).

In the world real estate plays a pivotal role in any economy. It provides a function that has a dramatic multiplier effect that is a key economic indicator. The business dictionary defines real estate as land and anything fixed, immovable or permanently attached to the earth or ground, buildings, roads, shrubs (Brueggeman & Fisher, 2007).

Many countries have in the past experienced house price fluctuations. This has been associated with economic instability. In many countries, like the U.S., price fluctuations have led to accelerated housing defaults with millions of residential properties having negative equity mortgages with outstanding loan balances being greater than the property values (Burnside, Eichenbaum & Rebelo, 2011). House prices are a significant indicator of the real estate market because prices are driven by the demand in the market. Demand, on the other hand, is determined by a number of macro and micro economic factors in an economy. Thus to fully understand the changes and developments in a real estate market, it is important to fully understand the forces behind price fluctuations. Higher property prices also tend to stimulate the economic activity through wealth effects, thereby encouraging investment and consumption spending.

## **2.2. Theoretical Review**

The theoretical review provide a theoretical foundation as a basis by which theorists have provided as an explanation to the causes of prices shifts especially in the residential house management in the country.

### **2.2.1. Game Theory**

Game theory has several features: there are two or more players, some choice of action is to be taken where strategy matters and the game have one or more outcomes (the outcome for wins, the outcome for losses) the game outcome depends on the strategy or measures attained or chosen by the parties in a game. In this perspective, therefore, the game theory postulates a model to study strategic interactions among different economic agents in imperfect markets. In the game theory, the outcome or results depends on the number of parties in the game, strategies employed by each part, the information available to every part and the payoffs of every player for every profile of strategy employed (Duffy, 2012). Decision making of the players is always interdependent. Hence players have to think ahead and devise strategies that are based on expected moves of other players.

In the real estate markets, individuals try to anticipate the moves of other party's e.g. financing institutions and make decisions based on that. Developers can use their

information advantage to influence consumers' decision and push up the real estate prices. This price game is likely to be a contributing factor in high housing prices (Duffy, 2012).

The study also based on Mu & Ma (2007) has studied game theory in the real estate market in a model with government, land developer and real estate developers as the players. They concluded that the optimal or maximum strategies chosen for the purchase is cooperation and tax regulation is an efficient way for government to maintain social stability.

### **2.2.2. Hedonic Model of Pricing**

On the hedonic model of pricing, the Lancaster's (1966) seminal paper is the pioneer academician to talk about the hedonic model of price. Lancaster presented a pioneer theory about hedonic utility. To him, utility must not be created by good itself but by the individual attribute of the goods that create the utility. Therefore, an item's utility is the aggregated utility of the individual utility of each of the attributes.

Based on the theory, Lancaster argued that items could be grouped based on the attributes the items possess or contain. Therefore consumer's decision is made with respect to a number of traits or features that a given good or service possess per unit cost. However, Lancaster was the first to talk about the hedonic utility; he said nothing about pricing or pricing models

Another academician Rosen in (1974), was the first to talk about hedonic pricing model. He stipulated that the product can be valued as a sum of all the utility generating features or traits, therefore the total price is a sum of all its individual prices. Thus the price can be expressed as sum total of all the prices of the individual characteristics However Rosen did not present the functional form of the hedonic pricing function. The model on its part can be implied as a non-linear pricing structure of the organization for the assets that can have an aspect of the Prices for the items of the house.

The theoretical application of the hedonic price model to the housing market rests or are based on several key assumptions. Initially, the homogeneity of the housing product is assumed. Another assumption is that the market operates under perfect competition, and

there are numerous buyers and sellers with free entry and exit. The model assumes that buyers and sellers have perfect information concerning housing product and price. Finally, the hedonic price model only works under the assumption of market equilibrium and that there are no interrelationships between the implicit prices of attributes providing on the cost of the house (Rosen, 1974).

The most confusing part of the model is the fact that it presents an irrelevant independent variable or misspecifications of variable called over-specification or where a relevant independent variable is omitted. This will lead to biased and the coefficient will be inconsistent (Rosen, 1974).

The major provision to this that we need just limited information like price of the property, the composition of house components and the specifications of functional relationship. It is a direct approach because the coefficient to determine the hedonic regression are needed to know the house structure, styles and nature. No information about the house buyer is needed. (Rosen, 1974).

### **2.3. Determinants of residential real estate prices**

The determinants of the residential real estate in countries are determined by a series of factors. In this study, the analysis takes is done based on the factors of size of the real estate market makes. There are a series of factors that determine the residential real estate prices. These include interest rates, GDP, level of money supply, and Inflation rate (Mak, Choy, & Ho, 2012).

A key factor that affects the residential real estate market is interest rates. In developed countries, the changes that occur in the interest rates in a country greatly determine the personal ability to attain the residential real estate in the country. This is because a reduction in interest rates causes the increase in the cost of acquiring money for the payment of real estate prices in a country. On the other hand, interest raises the cost to attaining the loans or mortgage lowers the demand for the residential real estate prices. The prevalence of low interests makes the buyers to attain more money and afford the purchase of several homes because of less or low mortgage payments that goes to the lender. The scenario does draw many buyers into the market that can lead to many

people bidding for the houses and uptick overall prices. The influence of the rates of interests, therefore, has on the individual ability to buy the residential real estate by increasing or reducing the cost of Mortgage is important. Many of the people in wrong way assume that the best and affordable factors for real estate attainment is mortgage. However, the rates for the mortgages are only an important and pivotal factor that affects the property values. The interest rate affect the capital flows, the supply and demand for capital including the investors required rates of return on the investments for the interest drive or affect the real estate prices in several ways (Liow, Ibrahim & Huang, 2005).

In addition to the above, the other factors that determine the residential estate prices are the economy health. The general economy is measured by the economic indicators such as GDP, employment, manufacturing activity and the prices of the goods in a country. The GDP is the country value of final goods and services produced in the country for a determined period. GDP per capital is known as the indicator of the country standard of living. The economic theory of per capita provides exactly that equals to the GDP income per capita. The low GDP mean that the low purchasing power hence the demand for the real estate affects the prices in decrement. However when the GDP increases the purchasing power increases hence the increased demand for the residential real estate houses, when the economy sluggish so is real estate, on the other hand, the cyclicity of the economy has a differing effect on different types of the residential real estates. A case in point is an investment in hotels will be more affected by the economic downturn than in the office buildings. The Hotels are a property that is sensitive to the economic activity in the lease structure in the business. Renting a hotel room is thought as a form of short term lease that can be easily avoided by the hotel customers if the economy is doing poorly. On the different front, the office tenants generally have longer-term leases that can't be changed in the middle of an economic downturn (Case, Shiller & Quigley, 2005).

According to AFI (2004), another factor that affect the residential real prices are disposable income and availability of financing are provided as the main drivers behind home prices in different countries. In fact, fast growing disposable income is surely key to explaining past price rises. Also, income disparities are directly a cause of the residential property price levels across the country's regions. Disposable income is

closely tied to unemployment. As unemployment (or the threat of future unemployment) increases demand for housing must fall, and with it prices. At this point, it is difficult to predict whether the unemployment rate will vary considerably in the foreseeable future in different countries. Homes are generally purchased with mortgage financing.

Furthermore, other factors that affect the real estate prices of the residential estates is inflation. This occurs because the real estate's need to respond to cost increases, in this case, land and building costs need to be differentiated, the available data is due to the growing security of the people construction prices have increased noticeably in the country. Furthermore the element of indirect impact of high raw material prices due to demand for the houses by different immigrants, hence there is nothing in building the cost of contributing to the home prices. In this case, land costs are different. They are not a cause but a consequence of real estate prices since higher property prices translate directly into a more robust demand for land and higher land prices hence the increment in the prices of the real estate (Gallagher, 2011). Inflation, therefore, affect the purchasing power of the money, inflation is measured by the changes in the consumer price index that measures the retail prices for the goods and services of the households (Liow, Ibrahim, and Huang, 2005). There exists a direct relationship between inflation and house prices of the residential prices in Turkey.

Among the other factors that determine the prices of residential real estate is money Supply which is a broad measure of money in an economy. Increase in the supply of money will have an effect on the inflation rate which most likely will also increase the inflation rate with its adverse effects on the economy. The excess supply of money may lead to an increase in the inflation and the environment thus affecting investment as a results of higher discount rate (Liow, Ibrahim & Huang, 2005).

There are different studies conducted by Mak, Choy, & Ho, (2012) in the study Region Specific Estimate of the Determinants of Real Estate Investment in China, applied a reduced form of equilibrium model to bring forth the source of real estate investment in China ( 22 province, 5 regions and 4 municipality). The period under study was from 2001 to 2006 from 186 data observations. Specifically, the results provided that the demographic, economic and the planning factors determine the prices of rent. The

relatively small coefficients in the real estate indicated that it has an effect but modest effect, the research suggest that Chinese government should have a focus on several policy parameter to achieve a balanced real estate investment in Chinese regions.

Further studies conducted by Alves, Yoshino, Corralo & Amtein (2011) in their research to test the dimensions of the asset pricing. The researcher collected the data for the real estates in San Paulo city from January 2001 to March 2000. The results were that the longer the maturity of the mortgage financing, the larger the prices of the houses but the decreasing interest rate spread stimulated the real estate market. Therefore as per the study, the hedonic model loses its relevance in the pricing as the market risk variables become more important and relevant in the study.

According to Lieser & Groh (2011), the determinants for the commercial real estate investments using a panel of 47 countries for a period of 2007 to 2009 explored that the different socio-economic, demographic and institutional traits affect the real estate investments due to prices. Using both cross-sectional and time series analysis, running augmented random effect panel regressions. Their results showed that economic growth, rapid urbanization, and compelling demographics attract real estate investments and also confirmed that lack of transparency in the legal framework, administrative burdens of doing real estate business, socio-cultural challenges and political instabilities of countries reduce real estate allocations.

In the study by Lu (2012) established that Chinese real estate enterprises is affected by factors like sub-prime crisis, stock market turmoil, and fierce market competition have been vigorously seeking new marketing tools, amongst them e-commerce ( Lu, 2012). Sun Lu conducted a questionnaire based study on actual conditions of 27 real estate companies in China. The study pointed out that deterministic factors influencing whether to adopt e-commerce business model are: intensity of industry completion, support from senior executives, organization size, costs etc. The factors that influence the choice of an application model in e-business that include interiliac provide the support from the executive, organization size, compatibility and attached risks. The examination of the relationship between the e-business model and their performance

revealed that disparities in enabling the customer service, growth of the economy and improve the company image.

In the study by Selim (2008) argued that using hedonic regression model analyzed the determinants of house prices for both urban and rural areas. The study revealed that water system, number of rooms, type of house, pool, house size, type of building and location are the most significant variables affecting house prices.

In the study by Mikhed (2009) provided that rapidly decreasing house prices in Us have been justified by the factors such as income, population, house rent, stock, market wealth, building costs and mortgage rate. The study was conducted in the standard unit root and cointegration test with the aggregate data. The nationwide analysis potentially suffers from the problem of lower power stationarity and the ignorance depending on regional house markets. Therefore, the study employed the panel data stationarity tests which are robust to cross sectional dependence. On the other hand, the previous studies from the US residential real estate considered several not just as one for the fundamental factors.

In contrary to the previous studies of the US housing market, they considered several not one fundamental factor. The findings confirmed that the panel data unit root tests have greater power as compared with the Univariate tests. However, the overall conclusions are that all the methodology house the prices and does not align with the alignment in the sub-samples prior to 1996 and from 1997 to 2006. It established that real estate prices take long swings from the fundamental value and it take decades before they to it. Furthermore using Unique 15 year panel in Florida Doerner (2011) established that the pathways are by change in the house prices can affect city revenue per capita and test for symmetric effect during the housing booms and busts. For the median-sized city, they established that increases in house price raise revenues, decreases in price have no effect on the revenues. Furthermore, the impact is small in terms of magnitude. While the strongest pathway is through assessed values and their results indicate that change in house price has an effect on the source of revenue. The study overall conclusion is that movements in Florida housing market are weekly and related to city property tariffs and



revenue per capita which fail to support arguments showed that popular press that house price variations on the budgets.

Stadelmann (2010) studied the robustness of the 33 communities with specific explanation of variables for house prices in the Swiss metropolitan area of Zurich based on the Bayesian model averaging. The critical analysis provided that a new way to perform hedonic variable selection and is responsible for the minimal list of the variables which serve as a prior constraint when predicting residential house prices or estimating the influence of other community specific traits in a metropolitan area in a highly developed country. In the context of the situation, the key variable that capitalizes with high posterior probability is location specific real estate. Accordingly, the concept of demographic as well as other socio-economic variables is minor in terms of relevance.

Egert and Mihaljek (2007) like the above study used the panel technique in the study to determine the house price dynamics in eight transition economies of east and central Europe plus the 19 OECD countries. The study provide that fundamentals of real interest and demography. In the study, the analysis also establishes to evaluate the relevance of transition specific factors like improvement in housing quality and housing marketing. The study established that gross domestic product, real interest rate and housing credit have a significant effect on house prices in CEE and OECD countries. The demography issues of labour markets development play fundamental functions in the residential real estate price dynamics in the countries studied.

In the study conducted by Pesdel and Vizek (2009) established that house price developments in six European countries of Estonia, Croatia, Ireland, Spain, and UK. The main focus was on exploring the factors that drive the rise of residential real estate prices in the countries studied. Therefore because house prices increases in the last two decades is not special to transition countries, the analysis was extended three EU-15 countries that recoded house price hikes. The issues of similarity and difference between the groups of countries in regard to house price determinants were explore. The empirical analysis of VAR employed to predict how GDP, housing loan, interests, and construction contributes to real estate price variations. Furthermore, the analysis of

multiple regression established that the driving factors for the houses prices was price inflation in all the groups of countries studied which results showed similar findings and involve the combination of income at personal and individual levels plus and interest rates.

In the study conducted by Julius (2012) provided that the determinants for Residential Real Estate Price in Nairobi, Kenya. The objectives were to analyze the factors that affect the real estate market given that low or little empirical evidence was available, in the concern of the analysis the study established that interest, money supply, inflation, and employment rate including the population dynamics had an influence on the house prices. The study used already existing data gotten from the Central Bank of Kenya and other Kenya statistical organization including one Hass consulting Ltd where a multivariate regression using SPSS established the presence of the relationship between variables. Finally, the findings established that employment growth and money supply information provide an avenue for the financial analysis providing a better comprehension of the real estate market and how it influences the housing prices

Muli (2011) study the relationship between real estate Prices and Mortgage lending in Kenya. The study was geared by the prevalence that the changes in the property prices and have extremely large in the recent. The study used a quarterly data base from the 2006-2010. The dynamic of the model established to assess the effect of the housing prices and the credit employing the multiple regressions. In this research, the authors conclude that changes in the housing prices are as a result of the movement of the mortgage credit. This results lead to evolution of housing prices that triggered the bank lending that the banks can't easily accommodate the real estate financing for the housing Prices, though the study shows a bi-direction implication that conclude with the real estate market does not have effect on changes in the residential housing price changes because of the affected real estate financing that is provided to the business.

Muthee (2012) studied the relationship that exist between economic growth and residential real estate prices in Kenya. Tracking the Hass Housing Price Index and Kenya's GDP numbers over a period of five years, data was retrieved from different sources but connected in similar or equal time and periods, reviewed and subjected to

regression analysis and tested for significance. The results indicated that there is a relationship between the variables revealing that a quarterly change in housing prices yields a quarterly change in GDP. The data that was collected and analysis indicated that residential real estate is a strong asset class which has been under exploited in portfolios. The much considerations taken by the investors providing an appropriate assessment of the means of the influences that exist on the real estate prices that have affluence on the state of the prices for the rent.

#### **2.4. Turkish Economy and real estate**

The population of Turkey comprise of close to 17Million Households having an average house size of 5 people. Marriage is the most vital deriver for the increment in household numbers, for a long time due to social and economic factors the house hold capacity is shrinking or reducing, these are mainly driven, the factors that have led to this is divorce and bachelor homes including the need to establish decent homes (Altan, Ozgür, 2009).

In the after month of the 2001 crisis in the country, a number of areas licensed the building constructions registered a dramatic increments, currently house hold openings are the fundamental source of residential demand while the demand for replacement has also generated the demand for real estate development. According to the statistics a series of the annual occupancy permits fluctuate around two hindered and eighty thousand to Three hundred and twenty thousand a sign of low level of unregistered construction sector activities in the country that possibly presents challenges to regulation of the economy (Ernst&Young, 2010).

The 1999 earth quake that occurred with an epicenter of the Izmit that is part of the metropolitan area of Turkey had a destructive effect on a greater part of Turkey like Istanbul, Izmit and Adapazari and also the major areas of the north of Turkey. The earth quake occurrence led to the reduction in the quality of housing in Turkey. There was an enactment of legislation for compliance with the earthquake standard for the new estates development mechanisms, though the current real estate needs testing to confirm the standard and reinforcement in order to enhance the quality of the real estate business to above average levels (BRSA, 2008).

The economy of Turkey is one of the competitive ones prevailing in the global. The country is ranked the 17<sup>th</sup> largest in terms of economic growth in the country. The country's GDP reached 742 Billion USD. The changes in the international research findings contend that Turkey can establish to compete amongst the 10 first world economies in the world in close to 40 years in the nearby future (DPT, 2009). The country is considered to be at the apex of growth and a the country's future in the European union if managed properly can effectively provide economic value to the partners and the investments in the trade in the sectors that are not grown in the sector, the trend in this economic overview provide the trends and movement of the economy and the real estate investment sector.

Turkey occupies areas of 778.000.000 km<sup>2</sup> were 26% part of this region is the forested area this occupies an area of 12.3% which is pasture land area. The remaining part of the remaining areas constitutes 480,000Km<sup>2</sup> and in the overall. The area for the residential is 5% that constitute 40,000Km<sup>2</sup>. The rural area stands at 56% (440,000KM<sup>2</sup>). Also we have close to 35 million parcels and 600 thousands registered land area in Turkey (Bank and Matarac, 2004). The real estate and the construction industry is the important for the operation and the growth of the country and the development of the Turkish economies. The housing and finance sector and the real estate market operate well and have an influence on the development of the country there is need for consistent real investment because of economic growth and migrations to the urban areas.

The ever increasing population size and the inter regional migrations to the country are likely to have a significant drive to the Turkey real estate markets. The 2007 Census put the population of Turkey to close to 70.6M at the end of 2007. While the same present that the fertility levels stands at 2.2 children per adult Woman, which is relatively greater than that of other European countries which is 1.5 children per woman. The current environment present 53% of the people as young and below the 30 years of age, this means that there is a future for population growth. The population/ demography trends have a high effect the real estate demand and the commercial housing schemes for the country (Deutsche Ban Research, 2008). Furthermore Deloitte (2009) argued that the estimated population growth and the size require a need for an environmentally strong housing scheme that can attain the growth of the construction sector. Furthermore the

previous years has seen the population of Turkey increased by at least 10 Million people this population include Istanbul's 2 Million with new people in the area. (Ernst &Young, 2010).

The real estate function in Turkey is undertaken by the private and public, semi- public organizations and cooperatives. There are substantial and reasonable weight of the little house units that house the settlements for the city centres of the provinces that are constructed by the individuals and the private organizations though some of them don't meet the required quality and are deemed to be of low quality. There is provided benefit from the limited public organizations and the real estate provided by the local councils or government, there is continuous settlement for Turkey to provide improved housing framework for the country (Halicioglu, 2005).

The housing estate or construction presents a protective but not a shorter term investment for the country, in particular context the particular environment particular for the presentation of the middle and low income residents. The specific attention from the rural area perspective and the resident involve a critical understanding in the country the housing and construction sector is fundamental for the people. The motivation in terms of the consumer's that are related to the protection of the saving from the negative impact of the inflation that causes the high inflation for the interest rates that affect the economy which are in dominance in the Turkey economy for the period of nearly 30 years. The fundamental results in the trend of housing cost high growth, the costs of the economy in terms of the financial bearing in Turkey therefore the asset market can't be expected to the high degree of registered growth (Onder and Berna, 2004).

The reduction of inflation is substantial and contributes to the investments including that of the real estate market. The fall of inflation and interest rates after the 2001 crisis and the increment in the liquidity their after increment of the investment in the housing and real estate business that is suitable for the country (Under secreteriate of Treasury, 2009). The prevalence of the housing sector makes an enormous contribution to the national development values at the level of 3.5% to 5.3% therefore providing the approach from 2004 to 2006 hence the case for the specific and interest that was from 2004 to 2006. The construction activity is critical for the gross domestic expansion. The

housing sector further provides that the job opportunities provide avenues for the improvement of the economy. The State Planning Organization (2006) argued that the construction industry is 1.1 million people on average and the overall employment for the people increased to 5.3 up to the end of 2005.

Foreign direct investments flows to the country through the real estate industry that provide the value through rent and business houses that have had an increase in the last years. The inflows in the real estate sector contributed a close to 5% and the construction sector for rent and business works was at 4.5% of the contributions from the foreign investments to the economy of Turkey. In the subsequent 2002, the real estate business fundamentally in the real estate business started to realize a growth margin towards the positive direction. The population growth, migrations from the villages, there is need for the construction of the more situational resistant constructions that particularly has the region close to the danger lines for the generation of the determinants that induce the investments in the construction sector for attaining its growth (Undersecretariat of Treasury, 2009). The revelations pin to the highlight and a revelation that fundamentally the growth of the economy support the development initiatives of the country and are fundamental for the growth and development of the country.

The findings from the Dealwatch data reveal that the 259 deals in the Turkey mergers and acquisitions for the 2008. In the same year the active sector that included the manufacturing ones transportation, real estate 26. The Total net estate for the procurement is 13 Billion USD is from 2003 to 2008. At the end of 2008 the 21,079 organizations that of foreign countries provide that the majority (6,210) operated in the wholesale business and the small business whereas 3,757 operated in the sector for the manufacturing business with 2,408 in the construction business for leasing (Undersecretariat of Treasury, 2009). The real estate business on average has therefore provide ground necessary for leveraging the country through mergers and acquisitions that fundamentally has a bearing on the growth and development mix of the country. The state of the economy through merger furthermore has also facilitated the generation and development plus growth of the real estate business in the country, these implies that the economy in terms of the growth facilitate the businesses growth and this has not left the real estate business below growth, fundamentally therefore a strong economic

environment provide ground for business to thrive and exist for long hence a strong business environment in the country that is fundamental for the development of the in-house capacity necessary for growth and the development of the country and other subsidiary activity.

Turkey is the top of the many countries that participate in the export of the construction business. The leading magazine with 31 companies in the country exporting the 225 for the construction business. Turkey is put as the second in the world after China in 2009. In the period for the 1972-2009 for the Turkish construction companies. The construction projects that are exported generate revenue , the Turkish construction projects is expected to attain 155 Billion USD in the period (Turhan, 2008).The changes depending on the estimation the new real estate demand in the country is on increase given the presence of limited high quality housing that is available on the market. The presence of a positive environment necessary for the construction sector therefore provides guidance to this environment. The real estate business does not just improve the capital inflows of Turkey but also provide a ground through which then business thrives for enhanced business performance in the country.

The study results from TurStat and the Housing planning for Turkey's housing requirement for the country is about Two Million either for the renewal and or for the change of the projects quantity and quality to attain the proper housing requirements. The growing population and urbanization, the economy of Turkey need to be 5.5 Million Houses for 2015. The presence of house deficits represents a more than half million housing units required to be built annually. The results also present that given the growing economic and rapid urban expansion of the buildings, furthermore the growth of the economy and rapid extension for the commercial, professionalism in the offices buildings (Turhan, 2008). Research (2008) estimates provide that the 5.3 Million that include 3.7 Million houses and 1.6 Million for the replacing) the new houses will be required in the period of 2007 to 2017 and another 500,000 while the additional house units are also needed each year for the period of more 10 years (2018 to 2027). The demographic traits of the opportunity providing the positive economic effect of the European Union that facilitate the members in providing the benefits of the political and providing the growing industrialization and stability for the country and other interest

groups in the country. In this assessment the methods for this will be the use of the underlining the positive affect the low issues provided. The assessment provide that positive impact motivates the demand for domestic demand for the real estate in the country

#### **2.4.1. Merits and demerits of the real estate sector**

The medals for the bright sector of the Turkey industry indicated that the objective of the assessment for the market require a cost benefit analysis and provide mechanisms for attempting to classify the merits and demerits of the business industry. The country's strength and the real sector or the construction business that provide Turkey utmost concentration to the investors for the business.

The context of the environment also provide that geo-political positions, the European Union candidacy, industrialization, growing the stability of the economy, The importance of the study on demography and the means of urbanization is sufficient for enabling the business values that support the public and private policy on the status of the supply and changes in the entrepreneurship that supports the local or country side demand factors affect the great value.

#### **2.4.2. Motives in Domestic Demand for real estate**

The presence of a high inflation that affect the country in terms of increasing the cost for lending and reducing the values of the purchasing affect the business including the housing sector supports or reduce the economy, this result in the investment patterns for the household in Turkish sector (Coşkun, 2010).

In the computation, the major asset in the household savings scheme provides the real estate and also presents the symbol for the status of the social and political environment of the country for the aspects of the village or rural villages environment for the country for the more land implies the presence of more powers of political nature of political nature and the contribution of the agricultural sector to the economy. Presenting the information on the attainment of the rents for the functions or undertakings that provide acceptable values for the real estate and first tracking of the construction sector to attain demand improvements in the country.



Furthermore expenditures on the house for the attainment of the capital for the rent a valuable issue of the traits of the consumer payment values among the consumers. In the environmental situation, Housing department of Turkey (2003) provides that the year of 1965 experienced the residential lease holders consisting of 38.66% of the household. The ratio also declined to 32% in the year of 2000. This means that close to Four Million people with the Monthly payments in the country, the residential holders could be the potential mortgage for the purchasers that is if it will be affordable to access the loan that are available. The data collected from the central bank of Turkey in 2008 reveal that the housing credit is composed of 33.3% for the house debt for the period ending 2008.

The results from the Mortgage federation (2007) contend that the housing ratio was 6.7% for the European Union countries. The ratio is 68% in Belgium in the year 2001 80percent for the Italy in 2002 and 75Percent in Poland for the year 2004. The Housing department (2003) contend that owned participation rate was 68.2 % for Turkey. According to Kongar (2003), though the average house cooperation was towards 40% in the town regions the management of individual house ratio seemed to be on increment in Turkey, demographics, rural migration for urbanization and improvement of the areas are the key fundamental compositions of the strongest domestic real estate development.

#### **2.4.3. Opportunity for Real estate markets in the Turkey economy**

Turkey through Istanbul is a key provider of the opportunities for domestic or foreign organizations and individuals. There prevail a series of official and the private organizations provide that an analysis of the values for the Istanbul construction sector. The emerging trends in the construction sector in the European Union for 2010, ULI and PwC (2010) was ranked as the 3rd for the investment project and values in the country and the initial for the growth and development, Contrarily, there exist property performance and the property expectations and opportunities especially in the Istanbul market seem to be the leading one and fundamentally affect the growth and development for the country.

The city of Istanbul is an essential leader in the real estate and construction industry and investment values that still need more space for the upper, middle and lower residential logistical and hotel environments though the estimated people can change in accordance

to relevant institutions in the country. It is fundamental that there is a striking housing shortage for the large and growing towns of Turkey. Taking into the account the demography, migration for the urban areas, current housing and productive. This seem to have logic and assume that residential values for the subsector in the real estate markets in such a situation Istanbul provide a more probable need for the development of the residential and real estate projects in the country.

The research presents that most of the Turkish provinces are experiencing a growing but high population growth for the period of coming 20 years. The population for the several provinces might increase by more than 30Percent for the period (Deutsche Bank Research, 2008). In the occurrence of the trends, the variations in the land usage occasioned by the population increment in the major cities of Turkey followed by the insufficient development plan where most buildings are not liscensed. Therefore, the built-up area in the province of Istanbul rose to 40% from 1990 to 2005 (Deutsche Bank Research, 2008).

Furthermore, it is fundamental to realize and note that the interesting trend in the importance of the financial services especially in Istanbul creates anticipation for the expansion of the real estate markets. The relevance of the financial sector in Turkey is an emerging one due to several issues. The Global Financial Centers Report (2010 and 2009) report that İstanbul constitute one of the ever increasing financial centers in the world furthermore some local reports analyzed that Istanbul positions and role in the financial center (The Association of Capital Market Intermediary Institutions of Turkey, 2007). The association of Turkish banks, 2007 and 2009; State Planning Organization, 2009). The state of the policy in Turkey provide that Istanbul as the financial center for the utilizing of the instruments against the potential regional competitors for Moscow and Dubai. The environment provided that optimistic values for Istanbul becomes a financial center with in the 10 years, this and other sectors provide the thinking and assumptions that real estate be considered the potential for the policies in the country.

The presence of strong economic ground facilitated by a strong financial sector is not only fundamental but provide a firm ground on which the real estate business is based, it further more provide that an environment that support the work through financing can

also generate revenue for those with plans of improving the real estate sector to work and design mechanisms for enhancing and developing the work requirements in the business environment. This prevalence support the existence of a strong and developing finance. An environment necessary for the finance generate business economic strength necessary for the organization's growth and business strategy

#### **2.4.4. Demerits in Turkey's Real estate Markets**

The economy of Turkey provides the values and merits that support the investors for the return that have to come with limited risks. The situation of the inconsistencies in the economy occasioned by social, economic challenges, unemployment, income inequality, poverty prevalence and levels plus infrastructure challenges related to inadequate water supply, electricity, public services, institutional weaknesses that have less effective legal system applicable for the construction sector in less, expected rate of return and legal security in both Turkish economy and real estate markets.

The absence and decrease in the values and potential for the business gains generate the values that are necessary for the business. The factors that support with emphasis to the negative impact of the inefficient finance related system link, the challenges in the real estate business evaluation for the market and transactions of government nature and the state sector challenges. The problematic issues those are relative with the importance of the measures to analysis the negative trend of the sector.

Because of financing issues, the presence of the business environment supports the development mix for the organization. The presence of inflation provide an influence on the mechanisms that reduce borrowing, the presence of inflation that cal for high interest rates reduce borrowing for the financial sector that affect the business. The financial sector growth in the business in negative form transforms the work that reduces the values of the business in the country especially in regard to investments in the country (World Bank, 2014). The environment of the interest rates hinders the development of the business that actually reduce the business strength and values of the business necessary for the generation of real estate business. The interest rates reduce the value of borrowing that hinder the business from attaining funding for the expansion of the business sector. An important dimension of the tax and subsidy system concerns

Turkey's complex regime of investment tax subsidies (OECD, 2012). This regime is based on transparent rules, but subsidization rates may reach very high levels for certain projects, depending on their product, regional and technological characteristics. Certain large investments may be subsidized for more than half of their cost. To ensure that these incentives do not distort competition excessively, the outcomes should be analyzed with the help of the legislated but not yet implemented state aid monitoring system.

#### **2.4.5. Linkage between Finance and Real estate**

The developed countries have existed for quite long period of time, construction capital which is present for the low and existing potential for the business which provides a reflection of the low risk premium due to presence of collateral security. The country with the less developed mortgage finance infrastructure, the financial market environment seems to serve the higher income people, new constructions and ownership occupied houses. The country with the non-existent mortgage financing, housing and real estate's development for the general performance of the business and the sector growth that the country can realize for the development of the business organizations.

The presence of the Turkish housing scheme is prevalent and support the environment that support the environment of the housing finance scheme will facilitate the development of the houses that can lead to the development of the real estate market in the business.

European Mortgage Federation (2007) argued that the residential mortgage per capita was 30 Euros, 100 Euros and 170 Euros in Turkey in consideration for the period of 2004 to 2006. The period again had relevant results that were Euros 650, 860 and 170 in Croatia and also 3080, 4100 and 5140 for Greek. The Deutsche Bank. Research (2008) provides that low mortgage loan to Gross Domestic Product ratio reveal that the more the population growth potential on the market, in the construction sector on the economy. Binay and Salman (2008) argued that there exist evidence that the income for the individuals are not capable of being purchased on the average homes in Turkey given that the current maturity and cost for the home credit. The people who entre in the contract must be having a higher income level, hence comparing the relatively small countries in the European Union in Turkey were the Mortgage market has the

classification of developed in terms of the primary market for the mortgage finance. this present the most important and functional middle and lower level income for the residents in accessing the house credit that has a limited focus in the comparison with higher income earners. The mortgage prevalence support the development values of the real estate business that generate the business values that are extremely concerned with provision of quality housing environment, these means that presence of mortgages are fundamental to the business power generation in the country.

The values of an unintended effect of the inadequacy in the functioning of the primary mortgage market affect the willingness of the developers in construction of homeownership units that over time can contribute to the shortage of the housing units, of particular concern more affordable price points. The building companies or the developers build housing units that they have information of selling to the potential buyers in the market (Ozsan ve Karakas, 2005).

In an addition, prevalence of the primary and secondary markets for the mortgage challenges, the financial situation and the financial challenges that are challenging the real estate market. It is seen that both the housing and rent prices exhibit the challenges during the crisis areas for example towards the period of 2001. In this context taking into account the negative effect of the 1994 to 2000-2001 crisis provided the financial challenges to the real estate, these therefore to the conclusion that the real estate market can be depressed in the periods of the time of the economic crisis. The values of the business environment support the development of the valuable force that generate the business environment in the work generating the business that support work in area of the real estate development.

#### **2.4.6. Challenges for the real Estate Appraisal**

The presence of the industry for the professional and independent industry analysis is important for increasing the performance of the industry from the investment degree and role (Aydinoglu, 2004). The real estate is one of the vital and functional role for the investment nature of the environment for the economy of Turkey and for economic activities in case of the investment establish a low level of the low real estate

performance for the real estate evaluation and analysis for purposes of the protection of the consumers in the country.

Assessing the situation the issues of the acquiring the information and the challenges to the real estate has a result to the transparency challenges to the process of pricing, costs valuations and therefore overall investments in the country. It is fundamental for the establishment of the structures that can reduce the process of the real estate investments for the investment players Therefore on the different perspective especially the shortage in the town areas and complexity of land use reduction or creation of Zones can cause appraisal problems in real estate projects (UYAP, 2016).

Therefore the connections between access to finance and to primary and secondary mortgage markets and the real estate market if weak in the economy. This present that observations in the real estate sector growth does not actually reflect the degree of the growing mortgage markets in terms of primary and secondary markets in Turkey. The situation in terms of the availability of the data in the low developed real estate's evaluation has to cause the outcomes to the real estate market.

The fair prices validity challenges had issues with management of the resources in the country.

The process of the appraisal challenges in the operation of the systems for the work process has a bearing in the impact of marketing the real investments to its satisfaction. In critical analysis the construction sector for the real of the real estate market cannot be compared though the real estate shows unique characteristics stocks show anonymity as asset class. It is fundamental conduct an analysis of the current positions for the real estate investments by using stock market investment as a measure or dimension. Even the challenging and complex market for the investors can easily lead to lots of information including stock market indexes, information on market crimes etc. The context of this provide that the existence of high level information differences or asymmetry can have less effect on the real estates in the rural or urban areas. This also creates incentives or irregular practices creations on real estate markets in favor of rent seekers.

Lastly the short coming in the real estate evaluation has led to negative effect over the protection of the public interests. It is also fair to argue that government plays an important role in real estate sector and provide responsibility by the central and the local governance structures to have an extensive authority that can affect the real estate market in a greater or broader market. In this understanding, the generations from the sale, leasing and establishing the state of nature, privatizing the properties of public nature, the examinations of the contracts and building an operate transfer for the public or private partnerships that support the field required for the real estate evaluation in Turkey, therefore taking into account the perceptions by the public and the transactions legalities, the management of public properties requires better real estate appraisal. The monitoring of the transactions is thus fundamental for enhancing the development mix for the organizations and fundamentally leads to the development of the resources necessary for the real estate business.

The evaluation market attains the international evaluation measures for the real estate business and the evaluation mechanism for the 2006. There is considerable regulation in regard to the activities undertaken in the banking and the capital markets for Turkey. The assessment of the organizations are the professional institutions that employ evaluators to establish the values for real estate variables of the real estate and real estate projects by attaining, analyzing and applying relevant data or information needs to accepted. The regulatory framework does not set regulations for the public properties hence the evaluation challenges for the real estate quality further more given the regulation of the representation of the significant effect and role the expected players such as NGOs and international body regulators view less for the degree of low evaluation for the government or public properties. The capital markets systems that have hindered the business growth that generate the eventual business growth and development for the country's real estate business in the country.

#### **2.4.7. Challenges in Housing Market in Turkey**

In consideration of the regulations for the housing practices there is not enough to understand the inadequacy of the real estate market providing an issues for the issuance of permits to the buildings and the criteria followed in the issuance of the permits as not

fundamental for the business environment (Turhan, 2008). Therefore setting the houses or structures that have a bearing on the work environment that can support or detract the process of the work level development especially in attaining an international real estate values that suit the global and country requirements to support development for the housing conditions in the work.

The presence of housing and construction issues that are not solved present challenges for Turkey. The status and management of the stakes in the management takes into consideration the measures for the framework plan that takes into account the buildup of cities and environmental conditions that can act as a support for community buildings. The house issue being constitutionally connected to the mission and vision of the state in regard to housing for the construction community necessary for evaluation of the business stakes. As a result it is expected that the state help households to solve or handle housing challenges in the country.

To provide an overlapping management solution to the house problems the state can be involved in the financing of the social housing and development initiatives for the development administration in Turkey. The department that is in charge of the construction and housing has a key role of providing the housing of good quality at the cost effective rates for the people to enable them live a decent life (European Mortgage Federation, 2007). To have an assessment of the organization, the financial structures for the housing need to also consider an assessment of the secondary markets, the absence of secondary mortgage market can have an overarching impact on the status of the working environment for supporting the construction sector for the investment establishment and real estate markets.

The prevailing options for the state for the reduce costs for the administration and development of the suitable construction. The reductions for development costs that is very fundamental for the reduction of the most important to reduce the cost for the housing sector. The estimation for the cost of land is typical for housing and construction for development projects that range from the 30% to 50% for the urban areas. It is expected that the public property consist majorly of the land that can be



categorically and seems for the government of the major Land lord in Turkey (Subasi, 2010).

The absence of an effective regulatory framework on the part of the government in regard to the housing quality fundamental undermines the state of the housing environment necessary for supporting the business expansion for the projects of the housing environment. The regulations do not just hinder the adoption of proper housing for the country but also reduce the value of the housing contribution to economic growth stunts to development and labour capacity reduction necessary for reducing the value and the state of the work done in the real estate business in the country.

The organization of the work towards the generation of the business strength is enough and generate the value for the economy, the reviews of the different papers has shown that having an appropriate mechanism for the economy supports the real estate prices and values on the other hand the value for the economy can be enhanced through real estate given that the mechanisms for enhancing the values for the business generation capacity towards the business assessment and generation values, therefore an economy can be improved through real estate investments by 2.3% of the real estate investment that generate

### **3. METHODOLOGY**

This chapter will describe in details the processes that will be involved in data collection in this study, how it will be organized and carried out. The chapter will present and discuss both quantitative and qualitative research, its rational, methods and the process of data collection, it will also discuss issues pertains to access, sampling procedures and in addition, it will present concerns on ethical consideration and issues to do with reliability and validity of the study. In addition, the chapter will attempt to discuss data analysis. Qualitative research methods of data collection will be employed to answer the research questions of this study as presented in chapter one.

#### **3.1. Research Design**

Research design is a formula that directs the researcher in collecting, analysing and interpretation of observed facts of data (Orotho 2003). This study will employ the use of cross sectional research with a time series approach where a quantitative approach will be used to investigate the determinants of residential real estate prices in Turkey for the period of 7 years from 2010 to 2016. Quantitative research is a systematic step by step process in order to describe and test the relationship and examine the cause and effect of the interaction among the variables. This study will employ the descriptive deign specifically the descriptive research design. Descriptive design is a non-experimental research that describes the characteristics of a particular individual, or of a group. It also involves events that have already taken place and may be related to present conditions (Kothari, 2004). The descriptive design will be used to discover causal description to provide precise quantitative description and to observe behaviour. The study is descriptive in nature because it enables or provides the best avenue for collecting the data that show the interrelationships and provide a situational description.

### **3.2. Research Population**

According to Mugenda & Mugenda (1999) target population is the group of individuals, events or objects which a researcher wants to use to generalize the results of a study. In this study, therefore, the stud population will entail all the areas of residence that include apartments, townhouses, villas, bungalows, cottages, and marionettes. As such secondary data for the period of 7 years will be collected from Turkish Central Bank (TCMB), Turkish Statistical Institute (TURKSTAT),

### **3.3. Sampling Design**

Sampling entails the process through which inference to the whole by investigating on part of the population. Sampling is meant to ensure that statistical analysis of qualitative or quantitative nature through examination of some selected units of the population. Through sampling scientific processed are used in the selection sampling units or populations that can provide the required estimated data that is related to the margins of uncertainty that come from partial or entire/ whole population. In this study, the researcher will use composite property index published on a half or quarterly basis for 7 years published by Istanbul city authority statistics department.

### **3.4. Data Collection**

Data collection can either be primary or secondary data collection. Primary is gather directly from respondent while secondary is mostly needed where the researcher is seeking to establish relationship between variables. The data collection will be done through secondary data that entail analysing the already published statistical data. The secondary data is collected where the researcher seek to establish relationship between the variables. For this study, we are dealing with House Price Index (dependent variable), interest rate, inflation rate, GDP and Populations (Independent variable). For the House Price Index, we collected secondary data for the period of 7 years from TCMB. For Interest rate, we collected annually data for the period of 7 years from Fred Economic Data, for Inflation rate we collected secondary data for the period of 7 years

from World Wide Inflation Data. For GDP and Population, we collected data for the period of 7 years from TURKSTAT.

### 3.5. Data Analysis

The analysis of data will be carried out through means of mean, standard deviation, percentages, regression and correlation through the usage of statistical packages for social scientists (SPSS)

In order to come up with the regression model showing the relationship that exist between the dependent variable of residential real estate Prices and the macro-economic factors of interest rates, GDP, population, and inflation a Regression analysis will be applied . The regression assessment will be done using internal attributes dimensions as proposed in the Green (1997) model

The variables under our study are house prices index, interest rate, inflation, GDP and population which it's in accordance with the study conducted by Julius (2012).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + E$$

Which can be translated into?

Where

RREP= Residential Real Estate Prices

IntR. = Interest Rate

InfR= Inflation Rate

GDP= Gross Domestic Product

POP= Population

$\epsilon$  The error term.

The regression function will express the effect of the independent variable on the dependent variable. The beta value will be the degree of the effect and relationship between the variables.

#### **4. DATA ANALYSIS, RESULTS AND INTERPRETATIONS**

In this chapter, the researcher had an indebt look at the analysis, results, and interpretation of the data collected. The data was collected from the Turkish National Bureau of Statistics, The Central Bank of Turkey, Fred Economic Data, and from the World Wide Inflation Data. The accuracy of the data, its reliability and validity was assumed on the bases of the publishers' credibility. The data obtained was fed into SPSS and used to detect how GDP, Interest Rate, Inflation, and Population has an impact on the housing prices using descriptive and multivariate regression model. The data collected are Housing Price Index for Turkey for the period of 7 years from 2010 to 2016, it monthly data that the researcher will use during descriptive statistics then for conveniences we shall use annually data for the inferential statistics. We also collected data about the current interest rate from 2010 to 2016 which covers the period of study. The initial data collected for descriptive statistic will be monthly data and for inferential statistics, we shall use annually data. Inflation, on the other hand, was collected both monthly and annually for the period under study. The monthly data is used for descriptive statistics while the annually data will be used for inferential statistics. GDP, on the other hand, was collected quarterly and annually from 2010 to 2016, the quarterly data will be used for descriptive statistics while the annually data will be used for inferential statistics. Population was collected annually from 2010 to 2016 and will be used for both descriptive statistics and inferential statistics.

With the help of SPSS we shall carry out a multiple regression analysis and backward elimination.

## **4.1. Descriptive Statistics**

### **4.1.1. Descriptive Statistics for Residential Real Estate Price**

House price indexes are important for numerous reasons as they can be seen to be crucial inputs for academic research which is aimed at gaining a better understanding of how the housing market functions such as how it analyses the determinants of house prices and the efficiency of housing market. And also giving the importance of housing in households' wealth, the measurement of house price movement is of high importance for both academic and practical perspectives. House price index can be noted for a number of reasons as they can be seen to be of great importance to us. When mentioning house price index, we go further to see they are very important imports used for academic research which is aimed at making sure a better understanding of the housing market operates as it goes to analyse those determinants of house prices and the efficiency of housing markets. In addition to this, it is also used for investigating issues which are relevant to the society such as analysing housing which are affordable or whether or not housing bubbles exist. As we go further to see that housing in households' wealth is of great importance. While studying the importance of house price index, it is worth noting that they should have some specific qualities. Due to the fact that median house price indexes are widely available in several countries, they have several biases due to the heterogeneity of its properties and when stated differently, such methods cannot be differentiated between changes in the composition of dwellings when sold from one time to the other and between movements in prices. So it is important to use methods that involve quality control and of which two of this of this methods are well known, namely the hedonic and repeat sales techniques. The hedonic method control is been done using the multiple regression models with properties having attributes such as independent variables. Meanwhile with the repeat sales method, quality control is been carried out in theory and achieved by considering only a subset of properties which have been sold repeatedly over a certain period of time. In addition to this, we have also the hybrid approach, which also goes to cover the repeat sales methods and hedonic thereby easing specification of issues of hedonic models and the sample selection biases of the repeat sales method (Steven et al., 2006).

The advantages and disadvantages of alternative methods: the weaknesses and strengths of various types of indexes are assessed into four criteria; firstly it is noted if the index method yields a constant quality index or not, as a good worth noting point, an index should track price changes for a house that has the same characteristics over time and price changes will also only result from changes in the market prices characteristics and not instead from differences in the features of properties which have transacted in the various period. And this can be noted to be a worth noting feature for any real estate index. In addition to this, house price indexes are always also used to measure affordability and so should be controlled in an index. The second factor is if the subset of properties that form the basis for the construction of the index is a representative of the inventory of properties. The third factor is that of the absence of revision, meaning the historical index values are unchanged when transaction prices for subsequent time period over a certain period of time are added and lastly it is worth seen that an index should be very easy when it is to be constructed and should not require unduly complex estimation techniques or very huge amounts of data.

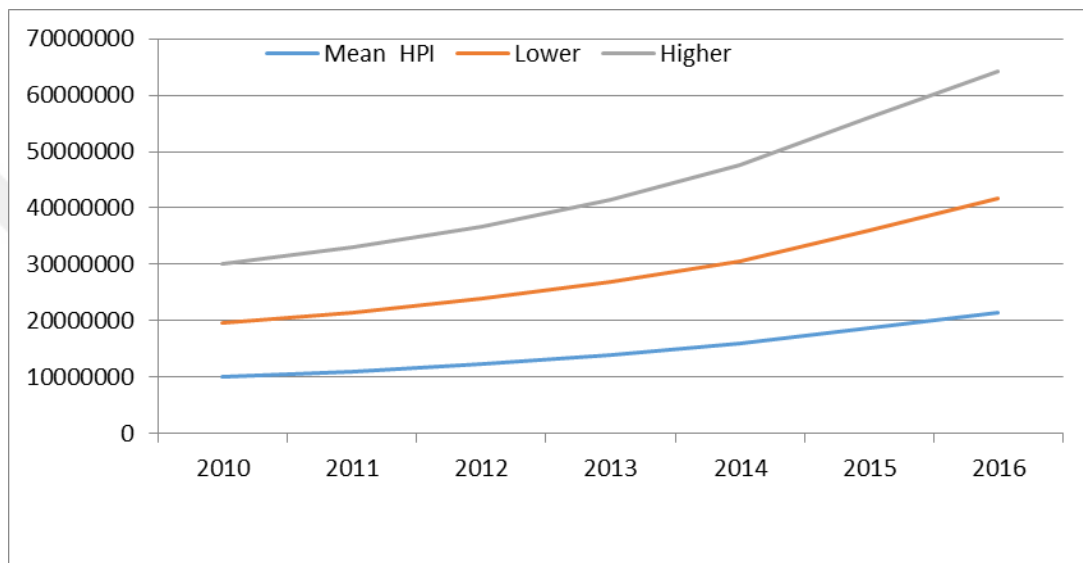
The main objective of this study is to carry out a critical analysis of the determinants of residential real estate prices; therefore it is logical to investigate the real estate prices as dependent variable within the period of study. The data shows prices from the composite index which includes the prices of houses ranging from apartments, duplex, mansions, and villas etc. The prices have increased steadily from 9.99 million TL in 2010 to 21.48 million TL in 2016. The results obtained are presented on the Table 1.

**Table 4.1.** The mean house prices by year

Year	Mean HPI	Std. Dev.	Lower	Higher
2010	9999500	224388.259	9692000	10356000
2011	11021500	357152.756	10429000	11530000
2012	12307917	399117.768	11622000	12861000
2013	13869250	530669.067	13006000	14637000
2014	15881167	763635.901	14755000	16999000
2015	18801917	957546.15	17219000	20128000
2016	21481417	819154.937	20232000	22595000

**Source:** Study Data 2017

Table 1. Shows the mean house prices from 2010 to 2016 which shows how the housing price has increased steadily from 9.99 million TL in 2010 to 21.48 million TL 2016. The standard deviations are also increasing steadily alongside the means. This is further presented on Figure 1 below



**Figure 4.1** Mean House Prices by Year

**Source:** Graphical Representation of Study Data 2017

#### 4.1.2. Descriptive Statistics for Interest Rate

Interest rate can be seen as a rate which either paid or charged for money to be used. An interest rate is often expressed as an annual percentage of the principal. It can also be calculated by dividing the amount of interest we have by the amount of the principal. Furthermore, interest rates can change because of certain reasons like situations caused by the result of inflation and Federal Reserve Board Policies. From a consumer's way of thinking, the interest rate is often expressed as annual percentage yield when the interest is earned like from a mortgage, a loan, the interest rate is expressed as an annual percentage rate which is abbreviated as APR. We further see that all nearly all types of loans come with two interest rates, that is the actual interest rate and annual percentage rate, this often help borrowers to decide what the true cost of the loans are from which



lender or the other. But often borrowers are sometimes confused in the process. In addition to this, the rate of interest can also be defined as that amount of interest to be paid per unit of time which is always noted over one year. Interest rates always change to reflect the ability and willingness of the borrowers to meet their obligations and the effectiveness at which the borrower's promissory note or bond or indebtedness can be turned into money. The level of interest rate reflects the quality of the money the debt is denominated, that the rate at which the borrower and the lender are taxed and the level of confidence at which the investors hold the relevant fiscal and monetary authorities deal with. Some philosophers like Plato and Aristotle condemned interest rate in the past. In order to look at the relationship between interest rate and the real estate prices in Turkey, we shall under a descriptive analysis. In our study, we collected data on discounted interest rate for the period of seven years, which is from 2010 to 2016 the data presented for descriptive purpose will be the monthly data and we shall compose to have annually mean. The result is presented on Table 4.1.

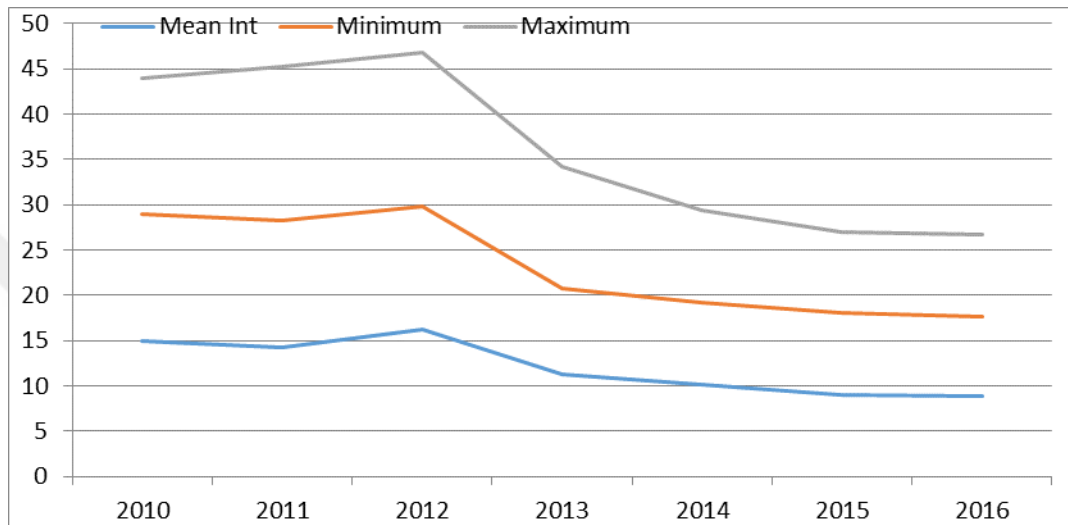
**Table 4.2** Descriptive Statistics for Interest Rate

Year	Mean Int	Std. Dev	Minimum	Maximum
2010	14.92	0.28	14	15
2011	14.23	0.83	14	17
2012	16.26	0.97	13.5	17
2013	11.23	2.02	9.5	13.5
2014	10.15	0.35	9	10.25
2015	9	0	9	9
2016	8.89	0.69	8.75	9

**Source:** Study Data 2017

From our study, the average interest rate is 14.92% in 2010, for 2011 the average interest rate stands at 14.25%, in 2012 average interest rate is 16.2%, in 2013 interest rate is 11.23%, in 2014 interest rate stands at 10.15%, in 2015 the interest rate stands at 9%, while in 2016 the average interest rates is at 8.98%. From our statistics the highest interest arrived is 16.2% while the lowest in 8.98%. Interest rate is major determinant and can affect the house prices simply by affecting the cost of financing and mortgage

rate, which intend affect the property level cost thus affecting it value. The standard deviations have been fluctuating in the same manner like the interest rate. This is father presented on figure 2 below



**Figure 4.2** Mean Interest Rate by Year

**Source:** Graphical Representation of Study Data 2017

#### 4.1.3. Descriptive Statistics for Inflation Rate

C.P.I stands for consumer price index which is a statistic often used to measure average price of a basket of goods and services which are commonly used in a period of time. The base period price of the basket is marked to 100 and the CPI value hovers above or below 100 helps reflect whether the average price has either decreased or increase over the said period. After we have gotten the CPI value of 2 given periods, we can therefor easily determine the inflation rate over the periods. When we want to estimate a CIP, we need to have a survey on people in order to identify what they purchase on regular basis. And this also helps in determining the basket of goods and services which are commonly used followed by the total price of the basket which are gotten from the market from current and base period.

Inflation is one of the major determinants of residential real estate prices, with respect to this we are oblige to analyze the inflation as a key factor. The data on inflation is based

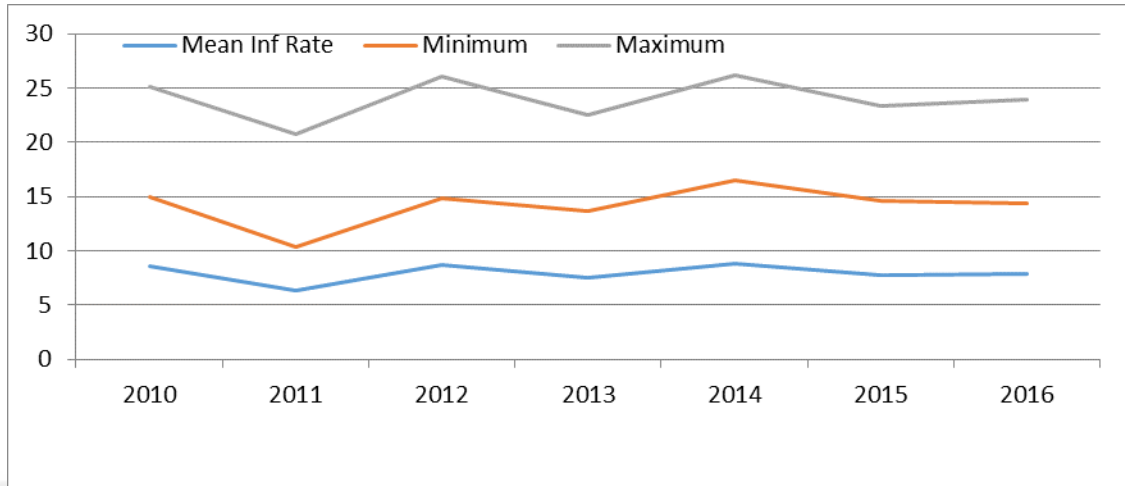
on Consumer Price Index (CPI). The data reveals that CPI Inflation rate is fluctuating with 6.33% for 2011 being the lowest and 8.8% for 2014 being the highest rate registered during the period of our studies. The data is presented on Table 3 below

**Table 4.3** Mean Inflation (CPI)by Year

Year	Mean Inf Rate	Std. Dev	Minimum	Max
2010	8.58	1.25	6.4	10.19
2011	6.33	2	3.99	10.45
2012	8.72	1.72	6.16	11.14
2013	7.49	0.73	6.13	8.88
2014	8.8	0.64	7.75	9.66
2015	7.75	0.61	6.81	8.81
2016	7.84	0.94	6.57	9.58

**Source:** Study Data 2017

From table 3. We can depict that the inflation rate is fluctuating representing 8.58% in 2010, to 6.33% in 2011, 8.72% in 2013, 7.49% in 2014, 7.75% in 2015 and 7.84% in 2016. The standard deviations have been fluctuating in the same manner like the mean inflation rate. The data is father explain in Figure 3.



**Figure 4.3.** Mean Inflation (CPI) rate by Year

**Source:** Graphical Representation of Study Data 2017

#### 4.1.4. Descriptive Statistics for GDP

GDP stands for Gross Domestic Product of a country which is used to measure a country's economy that is how a country is performing. The GDP of a country is the total value of everything which is produced in a country by all its people and companies located in that said country. And it doesn't matter much if they are foreign-owned companies or foreign citizens who are living in that country. But if they are all located within the border of that Country, the government then counts their production as the GDP of that Country. When it comes to calculating the Gross Domestic Product of a Country, the components involved here are Personal Consumption Expenditures plus Business Investment plus Government spending Plus Exports minus Imports. The different measures gotten from the GDP are important tools used to compare the economies of other countries and how this economies change as time passes or over the years. The GDP of other Countries can be also indicated by the size of an economy. So when dealing with this, the growth rate if a country helps us to measure if a country's economy is either growing or developing faster than before or if the Country's economy is growing more slower than it used to be in the past years. The growth rate of the Country is negative if it produces less than the quarter before and this indicates a

recession. Following this, if the growth rate is very high, then the Country will be noted for inflation.

When talking or mentioning the GDP of a country, it goes a long way to have many effects on the citizens of the country as it affects our personal finance, rate at which our jobs grow and also followed by our investment. Firstly, through this, investors compare the country's growth rate and decide where the best opportunities are good or suitable to invest in, because by so doing they decide if they should adjust their asset allocation. In addition to this, most investors always prefer to buy shares of companies that can be seen to be already in countries that are rapidly growing.

Secondly, the growth rate is used by the Federal Reserve to decide if or not they should implement economic policies such as monetary policies, expansionary policies to solve the problem of recession or to reduce or fight against inflation.

Lastly, we can use the GDP of a country to know which countries are best or suitable for us to apply for jobs in. Because if certain countries have a slow growth rate, or the growth rate is negative, it will cause or lead to unemployment. So by examining this, we will therefore know which country to apply for jobs in. The GDP of a country fluctuates as a result of business cycles because when the economy is booming and the GDP is rising, a point is then reached when inflationary pressures build up fast as the capacity of production and labour almost reaches or goes closer to full utilization. Thus causing the central bank to draw up a cycle to tighten monetary policy so as to cool down the rate of inflation and over a booming economy. Later on consumers and companies start cutting down their spending and the interest slows down as a result of a rise in interest rates. Slowing demand makes companies to lay off its employees which then goes a long way to affect consumer confidence. So in order to solve this problem existing in this cycle seen, the central bank then eases monetary policy so that economic growth and employment can be stimulated again so as to make the economy boom again. Furthermore, when talking about the GDP of a country, it does not totally show us the overall living standards or well-being of a country. Though when output of goods and services changes per person are often being used as a measure of whether the average citizen in a country is worse or better than another.

When measuring the GDP of a country, it can be done in three ways;

Firstly, the Output method which is a measure of all the market or the monetary value of all goods and services produced within the country. And secondly, we have the Expenditure method which measures the total expenditure incurred by all entities on goods and services within the domestic boundaries of a country and lastly followed by the income method which is a measure of the total income earned by the factors of production which include capital and labor that are in the domestic boundaries of a country.

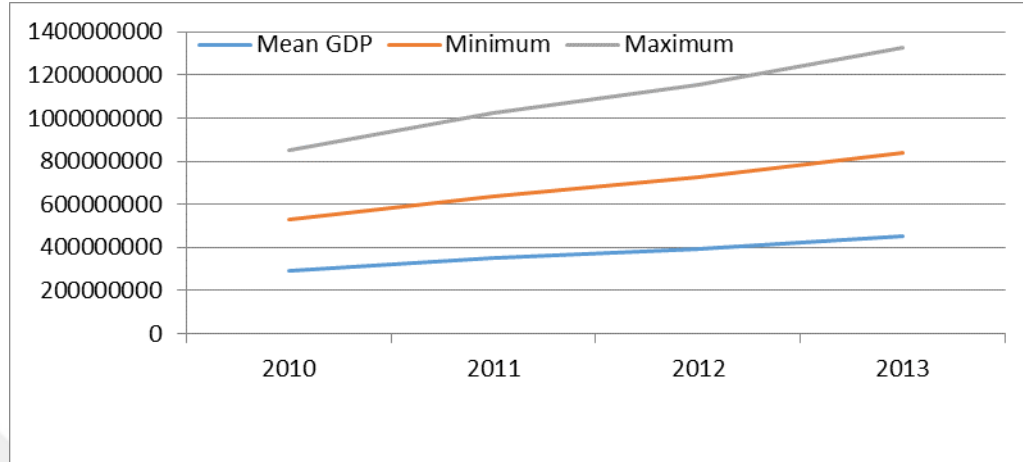
GDP is a key factor in determining the residential real estate prices, the GDP used is quarterly GDP calculated by the income approach. Looking at the data the GDP has been increasing steadily from 2010 to 2016. The mean GDP is obtained from the quarterly data of GDP.

**Table 4.4.** Mean GDP by Year.

Year	Mean GDP	Std. Dev.	Minimum	Maximum
2010	290003495	3.86	240272872	322360447
2011	348619271	4.47	290610290	385734139
2012	392418028	4.49	333164005	429732717
2013	452428271	5.01	385824643	491085106
2014	511116469	5.06	451269184	557419788
2015	584661873	6.84	497687043	646500325
2016	652131437	7.63	563890602	747226024

**Source:** Study Data 2017

From the table the GDP has been increasing steadily from 2010 to 2016. The standard deviation and mean have been increasing steadily like the GDP. This is further explained in Figure 4.



**Figure 4.4** GDP by Yearly Year

**Source:** Graphical Representation of Study Data 2017

#### **4.1.5. Descriptive Statistics for Population Growth.**

In many fields of study, population can be seen as a group of people, animals and other things that can be identified by at least one common feature for the purpose of collecting data and doing more analysis. So in order to gather information about a large population, data gotten is usually collected from a sample population

Population Pyramids: this is graphical representations of the age and sex of a population. Population pyramids are often referred to as age-sex pyramids. These graphs are often referred to as pyramids because they usually have shapes like that of a triangle even though at times other have different shapes. And when drawing out the chart, males are always on the left while females on the right side of the chart followed by a vertical line in the middle which separates the females from the males. There exist three types of population pyramids which are namely; stationary, expansive and constrictive.

Stationary population pyramids are those pyramids that show a somewhat equal proportion of the population under certain age groups. Here there is usually no increase or a decrease in population but the population is always stable.

Expansive population pyramids show populations that have a larger percentage of people more of a younger age group. And it is worth noting that populations with this

shape usually have very high rates of high fertility with lower life expectancies. In addition to this, many third world countries have expansive population pyramids.

Constrictive population pyramids have the name because they are constricted at the bottom. There exist a lower percentage of young people or the young age group. And they show declining birth rates, as each succeeding age group is getting smaller and smaller.

Population growth models can be defined as mathematical models which seek to represent the rate of growth in a population over a given time period. There exist various types of population growth models which can be seen under the following: Malthusian Growth model which is a variation on the exponential growth model positing that population tend to grow exponentially with the supply of available food grows linearly. And according to Malthus, nature has a built in systems of checks and balances which go further to limit the amount of damage that can be caused by a large group by reducing the population of that group once or after it has arrived at a certain point in time.

Logistic Growth Model is a population growth model that describes population which are able to grow substantially but not indefinitely. After a development period, the growth rate slows because of the availability of living space and resources. This model is more reliable to measure the population growth than the exponential model reason being it accounts for the real-world factors that inhibit the growth of population

Mechanistic population model seeks to explain the correlation that exists between food available, agricultural production and the size of the population. This model goes further to see that an increase in the amount of farming also goes a long way to increase the amount of food which is available while keeping the growth rated unaffected.

The study also laid emphasis on population growth over the period of time. The data obtained is annually which covers the period under studies.

Population can affect the house prices because it is has a direct relationship with demand, because as the population is increasing, they will need a place to stay thus affecting the residential real estate prices. The data collected is presented on the table below.



**Table 4.5.** Mean Population Growth by Year.

Year	2010	2011	2012	2013	2014	2015	2016	Mean Pop	Std
Pop Growth	72326914	73409455	74569867	75787333	77030628	78271472	79512426	75844014	2.6

**Source:** Study Data 2017

Base on the data the population is in an increasing trend over the years. 2010 recorded the lowest average population growth of 72.32 million people, followed by 2011 with 73.41 million people, in 2012 and continue till 2016 where we recorded 79.51 million. But the mean of our studies stands at 75.84 million while the standard deviation stands at 2.6.

## **4.2. Inferential Statistics**

Inferential statistics is used in this study to know if there is relations between the dependent variable (House Prices) and the independent variables (Interest rate, Inflation rate, GDP and population), as well at the strength of the relationship between dependent and independent variables. Under this section, we shall carry our inferential analysis which shall include the Karl Pearson Correlation, the coefficient of determination as well at the multiple regression analysis.

### **4.2.1. Coefficient of Determination on Determinants of Residential Real Estate Prices**

The coefficient of determination measures how the model is most likely to predict the result. R-Square is the square of the sample correlation coefficient between the dependent and independent variables. Therefore it measures the amount of variance or change in dependent variable (House Price) that the independent variables (Interest Rate, Inflation Rate, GDP, Population) accounts for when taken as a group.

**Table 4.6.** Summary of the Regression Model

Model	R	R-Square	Adjusted R-Square	Std. Err of the Estimate
1	1.000 <sup>a</sup>	1.000	.999	1588.77371

a. Predictors: (Constant), Population, Inflation, Interest Rate, GDP

R-Square= 1, this means the independent variables or predictors ( interest rate, inflation rate, GDP and population) taken as a set accounts for 100% of variance or changes in the outcome or dependent variable( House Prices). Statistically whenever adjusted R-Square is greater 0.75 then the model is significant.

**Table 4.7.** ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.062E10	4	2.654E9	1051.478	.001 <sup>a</sup>
	Residual	5048403.827	2	2524201.913		
	Total	1.062E10	6			

a. Predictors: (Constant), Population, Inflation, Interest Rate, GDP

b. Dependent Variable: HPI

Anova is the test to know is R-square is significantly > 0. From the table since Sig <0.05 which is =0.001, then we know R-square is sig <0.This means our predictors or independent variables can account for a significant amount of variance in the dependent variable of house prices. Therefore the regression model is significant.

- **Interpretation of Anova Table**

Test using alpha=1

$$F(4,2) = 1051.48 < 0.005 \quad R^2 = 1$$

This tells us overall our regression analysis was statistically significant because when take the 4 independent variables as a group they predict the dependent variable significantly.

#### **4.2.2. Multiple Regression Analysis for Determinants on Residential Real Estate Prices**

Multiple Regressions can be described as a statistical technique which is used to understand the relationship that exists between one dependent variable and other several independent variables. The use of this multiple regression as aimed at finding out a linear equation which can best determine the value of the dependent variable Y for different other values which are independent variables in X. when mentioning the multiple regression equation, it has two main uses which include firstly, to help identify causes, that is the regression equation is being used to find the nature of relationship between a dependent variable and an independent variable like seeing how the dependent variable changes as a result of changes in the independent variable. And secondly, for prediction reasons, the regression equation is also used to predict the value of independent variables Y for different values of dependent variables on the X side. We have instances of multiple regression which happen in our day to day life, an example of this is when a poultry company tries to determine which compensation is suitable, so as a result of this it finds out how the predictor variables for the salary are current, the total number of people the employee has supervised and also the amount of responsibility that employee is given. By this the firm can use multiple regressions to find out the potential employee's current salary is the single most important determinant of the salary that the person will be willing to accept at a new job site.

In a bit to elaborate more on the research topic “Determinants of Residential Real Estate Prices in Turkey”, the researcher conducted a multiple regression analysis to determine the relationship between the dependent variable and the independent variables. Multiple regressions is a statistic tool or technique which is used to analyses or predict the score of one variable on the basis of the score of several other variables. The purpose of this technique is to study the relationship between predictors or dependent variables and criterion or dependent variables.

The analysis of the multiple regressions is presented on Table 9.

**Table 4.8.** Multiple Regression Analysis on Determinants on Residential Real Estate Prices.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2999213.604	389082.301		7.708	.016	1325127.578	4673299.629
Interest Rate	-801.752	529.234	-.057	-1.515	.269	-3078.862	1475.359
Inflation	5146.294	1001.409	.109	5.139	.036	837.578	9455.011
GDP	.000	.000	3.752	10.540	.009	.000	.000
Population	-.045	.006	-2.811	-7.734	.016	-.071	-.020

a. Dependent Variable: HPI

Table 9. Shows the relationship between residential real estate prices and the four variables of interest rate, inflation rate, population and GDP to other variables. A total of 35 data points were used by the used of annually data for the period of 7 years to give more accuracy.

From the table, 9 it shows that everything held constant the residential real estate prices will be 2999213.60 TL, however after incorporating the values the model moves from

$$(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

To

$$RREP = 2999213.6 - 801.75IntR + 5146.29InfR + 0.00GDP - 0.045POP$$

Where

RREP= Residential Real Estate Prices

IntR. = Interest Rate

InfR= Inflation Rate

GDP= Gross Domestic Product

POP= Population

- **Discussion**

From the multiple regression equation established, we noticed the Y-Intercept = 2999213.6TL, this simple implies taking all factors (interest rate, inflation rate, GDP, and population) constant the price of real estate will be 2999213.6TL. From the data analysed we can also notice that holding everything constant at zero if we vary interest rate by 1 unit we will notice 801.75 reduction in the residential real estate house prices. Also if we vary the level of inflation rate by 1 unit while holding other variables constant at zero us will realize a 5146.29 increase in the residential real estate prices. Furthermore, if we vary by 1 unit the GDP while holding other constant at zero then we will be no change in the residential real estate prices. And finally, when we vary by 1 unit the value of population while holding other variables constant, we will realize a drop of 0.045 of the residential real estate prices.

At 95% confidence interval and at 5% significant level we have the following corresponding significant value. Interest rate had a significant value at 5% of 0.269. Inflation rate at 5% significant level presents a 0.038 significant value, while GDP at 5% significant level present a 0.09 significant value and finally population had a significant value 0.016 at 5% significant level. Interest rate has the highest significant value at 0.269; therefore interest rate is the most significant factor when determining the residential real estate prices in Turkey.

### 4.2.3. Backward Elimination Analysis for Determinants on Residential Real Estate Prices

Backward elimination can be defined as a method used to determine the regression equation that starts with a regression equation which includes all independent variables and then the remover variables which are not useful one at a time. Furthermore, the backward elimination can also be used to determine which model components are important to retain to the best account for the data. In addition to this, when we refer to backward elimination, we also deal with a form of stepwise regression in which the variables are systematically removed from the prediction equation, that is it removes the least important variables in a step wise technique and then leaves only the most important ones.

Backward elimination is statistical method used when one or multiple variables are not statistically significant from the multiple regression analysis. Looking at our sig. values at 95% interval and 5% significant level from the multiple regression analysis we will notice 0.269 for interest rate, 0.038 for inflation, 0.09 for GDP and 0.016 for population. Basing on these values we will notice our significant value for interest is greater than 5%, therefore, it is statistically not significant. In this situation, we will have to re run our model using the backward elimination in order to reduce the number of independent variables.

**Table 4.9.** Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	Population, Inflation, Interest Rate, GDP <sup>a</sup>		Enter
2		Interest Rate	Backward (criterion: Probability of F-to-remove >= .100).

a. All requested variables entered.

b. Dependent Variable: HPI

Table 10. Shows the result from Backward Elimination, in this table it shows the initial regression took into consideration all the independent variables of Interest rate, Inflation rate, GDP and Population, but from those independent variables Interest rate will be removed since it is not statistically significant.

**Table 4.10.** Summary of Backward Elimination Model

Model	R	R-Square	Adjusted R-Square	Std. Err of the Estimate
1	1.000 <sup>a</sup>	1.000	.999	1588.77371
2	.999 <sup>b</sup>	.999	.998	1901.00582

a. Predictors: (Constant), Population, Inflation, Interest Rate, GDP

b. Predictors: (Constant), Population, Inflation, GDP

This model summary shows both the model summary for 1 which is for the initial Multiple Regression and 2 for the Backward Elimination.

R-Square Model 1= 1, this means the independent variables or predictors ( interest rate, inflation rate, GDP, and population) taken as a set accounts for 100% of variance or changes in the outcome or dependent variable( House Prices).

R-Square Model 2= 0.99, this means the independent variables or predictors (inflation rate, GDP, and population) taken as a set accounts for 99% of variance or changes in the outcome or dependent variable (House Prices).

**Table 4.11. ANOVA<sup>c</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.062E10	4	2.654E9	1051.478	.001 <sup>a</sup>
	Residual	5048403.827	2	2524201.913		
	Total	1.062E10	6			
2	Regression	1.061E10	3	3.537E9	978.721	.000 <sup>b</sup>
	Residual	1.084E7	3	3613823.112		
	Total	1.062E10	6			

a. Predictors: (Constant), Population, Inflation, Interest Rate, GDP

b. Predictors: (Constant), Population, Inflation, GDP

c. Dependent Variable: HPI

Anova model 1 is the test to know if R-square is significantly  $> 0$ . From the table since Sig  $< 0.05$  which is  $= 0.001$ , then we know R-square is sig  $< 0$ . This means our predictors or independent variables can account for a significant amount of variance in the dependent variable of house prices. Therefore the regression model is significant.

**- Interpretation of Anova Table**

Test using alpha=1

$$F(4,2) = 1051.48 < 0.005 \quad R^2 = 1$$

This tells us overall our regression analysis was statistically significant because when take the 4 independent variables as a group they predict the dependent variable significantly.

Anova model 2 is the test to know if R-square is significantly  $> 0$ . From the table since Sig  $< 0.05$  which is  $= 0.000$ , then we know R-square is sig  $< 0$ . This means our predictors or independent variables can account for a significant amount of variance in the dependent variable of house prices. Therefore the regression model is significant.



- **Interpretation of Anova Table**

Test using alpha=0

$$F(3,3) = 978.721 < 0.005 \quad R^2 = 0$$

This tells us overall our regression analysis was statistically significant because when take the 4 independent variables as a group they predict the dependent variable significantly.

**Table 4.12.** Backward Elimination for Determinants on Residential Real Estate Prices

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2999213.604	389082.301		7.708	.016
	Interest Rate	-801.752	529.234	-.057	-1.515	.269
	Inflation	5146.294	1001.409	.109	5.139	.036
	GDP	.000	.000	3.752	10.540	.009
	Population	-.045	.006	-2.811	-7.734	.016
2	(Constant)	2825437.011	444854.003		6.351	.008
	Inflation	4544.036	1099.745	.096	4.132	.026
	GDP	.000	.000	3.653	8.725	.003
	Population	-.043	.007	-2.661	-6.360	.008

a. Dependent Variable: HPI

Table 4.12

Model 1 shows the relationship between residential real estate prices and the four variables of interest rate, inflation rate, population and GDP to other variables. A total of 35 data points were used by the used of annually data for the period of 7 years to give more accuracy.

From the table, 13 it shows that everything held constant the residential real estate prices will be 2999213.60 TL, however after incorporating the values the model moves from

$$(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

To

$$RREP = 2999213.6 - 801.75IntR + 5146.29InfR + 0.00GDP - 0.045POP$$

Where

RREP= Residential Real Estate Prices

IntR. = Interest Rate

InfR= Inflation Rate

GDP= Gross Domestic Product

POP= Population

#### - **Discussion**

From the multiple regression equation established, we noticed the Y-Intercept = 2999214TL, this simple implies taking all factors (interest rate, inflation rate, GDP, and population) constant the price of real estate will be 2999214TL. From the data analysed we can also notice that holding everything constant at zero if we vary interest rate by 1 unit we will notice 801.75 reduction in the residential real estate house prices. Also if we vary the level of inflation rate by 1 unit while holding other variables constant at zero we will realize a 5146 increase in the residential real estate prices. Furthermore, if we vary by 1 unit the GDP while holding other constant at zero then we will be no change in the residential real estate prices. And finally, when we vary by 1 unit the value of population while holding other variables constant, we will realize a drop of 0.045 of the residential real estate prices.

At 95% confidence interval and at 5% significant level we have the following corresponding significant value. Interest rate had a significant value at 5% of 0.269. Inflation rate at 5% significant level presents a 0.038 significant value, while GDP at 5% significant level present a 0.09 significant value and finally population had a significant value 0.016 at 5% significant level. Interest rate has the highest significant value at

0.269; therefore interest rate is the most significant factor when determining the residential real estate prices in Turkey.

Model 2 shows the relationship between residential real estate prices and the three remaining variables of, inflation rate, population and GDP to other variables after eliminating the interest. From the table, 13 it shows that everything held constant the residential real estate prices will be 2825437TL, however after incorporating the values the model moves from

$$(Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4)$$

To

$$RREP= 2825437+4544.036InfR+0.00GDP-0.043POP$$

Where

RREP= Residential Real Estate Prices

InfR= Inflation Rate

GDP= Gross Domestic Product

POP= Population

#### - **Discussion**

From the multiple regression equation established, we noticed the Y-Intercept = 2825437.011 TL, this simple implies taking all factors (inflation rate, GDP, and population) constant the price of real estate will be 2825437TL. From the data analysed we can also notice that holding everything constant at constant if we vary the level of inflation rate by 1 unit while holding other variables constant at zero we will realize a 4544.036 increase in the residential real estate prices. Furthermore, if we vary by 1 unit the GDP while holding other constant at zero then we will be no change in the residential real estate prices. And finally, when we vary by 1 unit the value of population while holding other variables constant, we will realize a drop of 0.043 of the residential real estate prices.

At 95% confidence interval and at 5% significant level we have the following corresponding significant value. Inflation rate at 5% significant level presents a 0.026

significant value, while GDP at 5% significant level present a 0.003 significant value and finally population had a significant value 0.008 at 5% significant level.

**Table 4.13.** Excluded Variables<sup>b</sup>

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
2	Interest Rate	-.057 <sup>a</sup>	-1.515	.269	-.731	.169

a. Predictors in the Model: (Constant), Population, Inflation, GDP

b. Dependent Variable: HPI

This Table simple shows the excluded value from the Backward Elimination which is interest rate. At 95% confidence interval and at 5% significant level we will have a corresponding significant value of 0.269.

## **5. DISCUSSIONS OF FINDINGS, SUMMARY, AND RECOMMENDATIONS**

This chapter presents the discussions, summary and the recommendations for the findings based on the study topic. This chapter, the researcher presents the various methodological analyses. The chapter provides the discussions, summary and recommendations for the findings of the study. The beginning sections presents the summary of the results of the study analysed while the following (second section) presents the results and summary of the study hypothesis then thirdly the section focus on suggestions for the future research. Then the researcher discusses the limitations of the study research and the limitations faced in conducting the research in the study.

### **5.1. Analysis of the findings**

The purpose of the study is to establish the relationship between the determinants of house price and house prices in Turkey. The study was to establish the determinants (interest rate, inflation rate, GDP and population) of residential real estate prices Turkey. The study was a secondary data research that involved was in collection of data from the Turkish National Bureau of Statistics, the central bank of Turkey, Fred Economic Data, and from the World Wide Inflation Data. The data obtained was fed into SPSS version and used to detect how GDP, interest rate, inflation, and population has an impact on the housing prices using descriptive and multivariate regression model. The assessment provided the descriptive study on the rent prices for the period of 7 years, descriptive statistics for interest rate, for inflation rate, GDP and population growth, presentation of inferential statics, analysis of the relationships between determinants.

## **5.2. Importance of the study**

### **5.2.1. To the researcher**

The study provides an opportunity for the researcher to establish the practical information and knowledge that has been an opportunity for the study program. The practice is also that it provides confidence in enabling the completion of the research by the future academicians as it will provide evidence of literature that will guide future researchers.

### **5.2.2. To the organization**

The study conducted is fundamental in conducting an assessment of the inflation, interest rate, and GDP and population growth in Turkey and provide a critical assessment of the fundamental issues in explaining the house prices in Turkey. The study will enable the establishment of the factors that have issues on housing prices and take measures for improvement. The study results will also provide avenues through which housing prices can be dealt with especially through reducing of inflation, improving GDP, controlling the exchange rates in the country for the attainment of stable housing prices.

### **5.2.3. To the Government Officials.**

The study results will provide a highlight on the true views perceived by the government officials regarding the issues of inflation, exchange rate, GDP and Population growth as a determinant for housing prices. These, therefore, provide the organization with the chance of reducing the house prices in Istanbul Turkey.

### **5.2.4. To the University**

The study will provide a future reference to the future researchers as a basis for future research including the students of my University. The study, therefore, provide a spring board for future researches as means of the study topic and assessing the means of understanding the house prices causes in the country.

### **5.3. Summary of the Study**

The study investigates the determinants of housing prices in Istanbul Turkey these include exchange rate, inflation, and GDP and population growth based on the historical or previous statistical data for the period of 7 years.

The objective was, therefore, to test how the determinants of exchange rate, inflation, and GDP and population growth influence the house prices in Turkey. The objectives reveal that exchange rate had a negative relationship with house prices meaning that increasing exchange rate increased house prices further more the prevalence of inflation, population growth and GDP increase accounted for a price increase in the house prices based on the study data.

Finally, the issues of the inflation, GDP and population growth had positive effect on the house prices or increases. The study provides an assessment of the influence of the variables under the investigation and exchange rate had a negative influence on House prices.

To enhance the issue of this study the independent variables that were four included in this research to test relationship and dimension of the independent variable was tested with the dependent variable (house prices).

### **5.4. Discussions**

#### **5.4.1. Discussion of Findings**

This section provide an assessment of the discussion of the findings in a detail form explaining the relationship between House prices and inflation, interest rates, population growth and GDP

GDP, interest rate, inflation, and population. The assessment, therefore, explains the degree of relationship between the variables of inflation, interest rates, population growth and GDP on housing prices.

In the study first provided the descriptive statistics on the variable inflations rate, interest rates, population growth, GDP and that of housing prices. The descriptive statistics

reveal that the housing prices have increased over a period of time. The descriptive statistics on the interest rate also signal increasing interest rates while the inflation was controlled or reduced over a period of time the population growth was also steadily increasing and the rate of GDP over the 5 years increased steadily.

Further analysis of the correlation assessment reveals there is a strong negative relationship between house prices and interest rate, that there is a weak negative relationship between house prices and the inflation rate which stands. It was established that there is a strong positive correlation between house prices and the population. There was a strong positive correlation between house prices and the GDP. The study assessment is based on relationship between the variables.

A further assessment of the regression analysis reveals that the determinants of change in dependent variable (House Price) that the independent variables (interest rate, inflation rate, GDP, Population. The independent variables or predictors (interest rate, inflation rate, GDP, and population). The research results compared by testing the researcher. The variables of the study that included the inflation, GDP and Population growth that had a significant relationship with the prices of the housing prices while exchange rate had a negative relationship in the variables analysis.

#### **5.4.2. Discussion in comparison with previous studies**

The study provide an interesting study area of interest rates, GDP, population growth and inflation as the independent variable and shows how they affect the house prices in Turkey. The study was important as it provide a critical understanding of the salient determinants of house prices in the country implying that the four determinants have a high bearing on the prices of houses in the country. The issues of interest rates, GDP, population growth and inflation have had a great bearing on the house prices in Turkey and these are found to determine the nature and rate of the variations in the house prices.

Regarding the aspect of interest rate, the aspects of the study are never the less in agreement with the previous studies Liow, Ibrahim & Huang (2005) opined that a key factor that affects the residential real estate market is interest rates. In developed countries, the changes that occur in the interest rates in a country greatly determine the personal's ability to attain the residential real estate in the country. This is because a



reduction in interest rates causes the increase in the cost of acquiring money for the payment of real estate prices in a country. On the other hand, interest raises the cost to attaining the loans or mortgage lowers the demand for the residential real estate prices. Even Egert and Mihaljek (2007) like the above study established real interest and demography. In the study, the analysis also establishes to evaluate the relevance of transition specific factors like improvement in housing quality and housing marketing.

Case, Shiller & Quigley (2005) argued that the general economy is measured by the economic indicators such as GDP, employment, manufacturing activity and the prices of the goods in a country. The GDP is the country value of final goods and services produced in the country for a determined period. GDP per capita is known as the indicator of the country standard of living. The economic theory of per capita provides exactly that equals to the GDP income per capita. The low GDP mean that the low purchasing power hence the demand for the real estate affects the prices in decrement. Lieser & Groh (2011) also contend that the determinants for the commercial real estate was economic growth, rapid urbanization, and compelling demographics attract real estate investments and also confirmed that lack of transparency in the legal framework, administrative burdens of doing real estate business, socio-cultural challenges and political instabilities of countries reduce real estate allocations.

furthermore, Muthee (2012) analyzed the relationship that exist between economic growth and residential real estate prices in Kenya. Tracking the Hass Housing Price Index and Kenya's GDP numbers over a period of five years, data was retrieved from different sources but connected in similar or equal time and periods, reviewed and subjected to regression analysis and tested for significance.

Gallagher (2011) further contend that other factors that affect the real estate prices of the residential estates is inflation. Inflation, therefore, affect the purchasing power of the money, inflation is measured by the changes in the consumer price index that measures the retail prices for the goods and services of the households. This occurs because the real estate's need to respond to cost increases, in this case, land and building costs need to be differentiated, the available data is due to the growing security of the people construction prices have increased noticeably in the country.

Just like the study results, interest rates have a negative effect on the house prices, Alves, Yoshino, Corralo & Amtein (2011) in their research to test the dimensions of the asset pricing. The researcher collected the data for the real estates in San Paulo city from January 2001 to March 2000. The results were that the longer the maturity of the mortgage financing, the larger the prices of the houses but the decreasing interest rate spread stimulated the real estate market.

Concerning the population growth as a determinant of the house or real property prices. The determinant of population growth as per the study reveals that positive population growth derives the price of real estate to increment. Mikhed (2009) argued that rapidly decreasing house prices in us have been justified by the factors such as income, population, house rent, stock, market wealth, building costs and mortgage rate. The study was conducted in the standard unit root and cointegration test with the aggregate data. Even Julius (2012) provided that the determinants for residential real estate price in Nairobi. The purpose was to look at the factors that affect the real estate market given that low or little empirical evidence was available, in the concern of the analysis the study established that interest, money supply, inflation and employment rate including the population dynamics had an influence on the house prices. The study used data from the Central Bank of Kenya and other Kenya statistical organization including one Hass consulting Ltd where a multivariate regression

### **5.5 Contribution of the present study**

The study add value to the study by providing addition into understanding the fundamental determinants of the house prices in Countries in the world given that this is a global issues that has attracted little attention. The study therefore provide newness and direction on the focus of the population growth, inflation and GDP as key determinants to the house prices in countries that can attract the real estate policy intervention to curb the economic influence generated on the house prices in countries.

The study will also provide avenues of understanding the effect that interest rates, inflation, GDP and Population drive the housing prices. The study provides a value of

the requirement in underscoring the relevance of these economic determinants in evaluating or attaining the house prices reduction for growth and sustainability.

The study reveals that housing prices is concerned with the economic down turns in terms of growth and challenges to growth that have influenced the house prices increment in the countries that have experience increments.

## **5.6. Limitations of the study**

### **5.6.1. Limitations of the researcher**

Below are the limitations the researcher encountered during the course of the research.

- i. The cost of the research were very high in regard to the already incurred cost of accessing relevant stationary, printing and the yet to be incurred cost of photocopying, binding, transport, and telephone charges. The financial constraints were solved by asking my friends and family to raise some money for my research work.
- ii. In view of the following threats to validity, the researcher claimed an allowable 5% margin of error at 0.05 level of significance this led to accurate data production though not 100% perfect.
- iii. Lack of experience: At the time this research was carried out, the researcher was inexperienced in master dissertations. Being a bachelor`s degree graduate without key understanding on the issues of research especially statistical analysis was challenging. However, the researcher conducted senior friends and colleagues with experience who provided experience for analysis.
- iv. The research environments were classified as uncontrolled settings where extraneous variables might have influenced on the data gathered such as comments from other respondents, anxiety, stress, motivation on the part of the respondents while on the process of answering the questionnaires. The researcher created rapport with respondents such that these conditions could be minimized.

### **5.6.2. Limitations of the Study**

All researches do have a come characteristic because it faces limitations. There was difficulty into collecting data since the data from the different source was varying so standardizing it was not acquired with ease. The scattered nature of the information may not be attained and compiled with ease.

The researcher also acknowledge in this setting imposes the limitation in the general assessment of result, lack of the variance crossways stores which look upon into ethnicity and gender might partially account of the in significant finding.

### **5.7. Recommendation for future research**

The study focus was on the determinants of house prices in Istanbul Turkey. The data study reveal that a series of factors determine the house prices in Istanbul, using the secondary or historical data sheets on the independent and dependent variables that measured the study, the study results point towards the existence of the high house prices in Turkey as explained majorly by the determinants mentioned above.

The study results set a ground for future research in a number of avenues for instance the study reveal interest rates having a negative significant results in determining the house price, future research could concentrate on more data most especially for a long period to more expound this revelation.

Regarding the study conducted on the topic that reveals a significant effect of inflation, interest rates, GDP and population growth on house prices. The future research will be consider the limitation of this study and try to avoid the same limitation. The future researchers should expound on the scope of the variables to cover more variables that should also include more social factors like urbanization, education among others in order to avoid over concentrating on the economic factors.

The study can further more expand the scope of the variables to include political factors since the issues of politics and legislation can have an arch bearing on the house prices of a country. The fundamental values of this can therefore provide a more resonate ground for explaining the study and provide more comprehensive ground for the study.

Thirdly the future researchers can expound the scope of the study by covering a long period of time like 10 years so as to observe the occurrence or prevalence of the determinants of house prices and the house prices over a long period of time. Conducting a study for a long period of time is fundamental for enhancing the development mix and attaining mechanisms that can support the development of a country after assessing the presence of the occurrence in the variables for the long period of time.

The study faced a hindrance or limitation of unavailable data, though their existed the implications that there are interventions to collect and analyze the data related to housing as means to improve the housing conditions at reduced prices, with the presence of detailed information the study need to extend the scope of the study determinants especially on the supply side of housing pricing.

Furthermore, the results indicate that it is not clear why for example the regression showed positive relationship with the inflation and house prices while the it is known that inflation has a negative bearing on the house prices. This, therefore, dictate that for more studies to be conducted to asses and evaluate the short run as well as the long term effect of the factors on the prices increment for the houses.

### **5.8. Implication of the study**

The study results and analysis for the research provide the opportunity on the information on the extent to which inflation, interest rates, GDP or economic growth and population growth account for house prices in Istanbul Turkey. The country in terms of the policy makers need to consider appropriate that to deal with control of real estate prices is fundamental and need to have tracking at the options of the variables studied. The study findings also imply that the key variables of the study need to be studied in conjunction with probably other considerations in a way of assessing the mechanisms through which real estate price reductions can be dealt at the options of the four variables though other considerations need to be adequately dealt with in handling the study and creating meaning for the study.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

In the final chapter, it will present a final conclusion and recommendations for further studies. This can be elaborated below

### **6.1. Conclusions**

The study that set to investigate the determinants of real estate prices of the houses. The determination was based on interest rates, inflation Gross domestic product and population growth. The results provide significant correlation on the residential real estate prices on the determinants studied. The study concludes that there is a significant relationship between real estate house prices with interest rate, inflation, and GDP and population growth. Therefore the rise of the house prices in Turkey is effectively explained by the macroeconomic aspects under the study including the population growth of a country. Even though the study established a negative relationship between interest rates and house prices. The study further conclude that based on the results there was overall increment in the house prices over the period of time under the study a signal to the ever changing factors of the study (inflation, interest rates, GDP, and population growth). The study variables, therefore, can be cited as being salient explanations to the house prices in Turkey provided in the context of the study. Therefore to control house prices, there is need for effective consideration of the macroeconomic variables.

### **6.2. Recommendations**

The house price increment was caused by the macro variable under the study, Interest rates had a negative effect implying that there is need by the ministry of finance and the central bank to regulate interest rates in order to attract borrowing at lower rates that can

facilitate in the construction of residential real estate to ensure that the houses are available for the people at reduced prices.

concerning the positive correlation factors, financial analysts need to sensitize the clients the need for them to monitor the factors of the study in order to enable the making of informed decisions as means of providing means to encouraging the development of the of a strong a stable market for the real estate business.

There is need by the government to closely expedite the interest rates and inflation and maintain these factors at reasonable horizons given that there is significant contribution to the house prices increases in the country. The high central bank rates restrict borrowing for investments while inflation increase the cost of investing in houses hence the need to control these variables in the study.

Lastly, the study recommends that government intensifies the processing of attaining statistics on the housing prices, especially for the residential real estate. This will increase the data availability significant for effective decision making regarding the avenues for the house prices control.

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## APPENDIX

**Table A1:** Quaterly GDP FROM 2010 TO 2016

Year	General	Q1	Q2	Q3	Q4
2010	1160013978	240272872	278647853	318732806	322360447
2011	1394477165	290610290	336234139	381898595	385734139
2012	1569672114	333164005	382070001	424705390	429732717
2013	1809713086	385824643	441539542	491263793	491085106
2014	2044465875	451269184	487151068	548625834	557419788
2015 <sup>(t)</sup>	2338647493	497687043	562947770	631512354	646500325
2016 <sup>(t)</sup>	2608525749	563890602	631232693	666176429	747226024

**Table A.2:** Total Population from 2010 to 2016

Year	Population
2010-01-01	72326914
2011-01-01	73409455
2012-01-01	74569867
2013-01-01	75787333
2014-01-01	77030628
2015-01-01	78271472
2016-01-01	79512426
	75844014

**Table A.3: Monthly House Price, Interest Rate and CPI Inflation Rate**

Date	HPI	Interest Rate	Inflation Rate
Jan-10	9692000	15.00	8.19
Feb-10	9722000	15.00	10.13
Mar-10	9777000	15.00	9.56
Apr-10	9839000	15.00	10.19
May-10	9895000	15.00	9.1
Jun-10	9947000	15.00	8.37
Jul-10	10005000	15.00	7.58
Aug-10	10094000	15.00	8.33
Sep-10	10159000	15.00	9.24
Oct-10	10220000	15.00	8.62
Nov-10	10288000	15.00	7.29
Dec-10	10356000	14.00	6.4
Jan-11	10429000	14.00	4.9
Feb-11	10545000	14.00	4.16
Mar-11	10661000	14.00	3.99
Apr-11	10776000	14.00	4.26
May-11	10941000	14.00	7.17
Jun-11	11051000	14.00	6.26
Jul-11	11122000	14.00	6.31
Aug-11	11142000	14.00	6.65
Sep-11	11268000	14.00	6.15
Oct-11	11363000	14.00	7.66
Nov-11	11430000	14.00	9.48
Dec-11	11530000	17.00	10.45
Jan-12	11622000	17.00	10.61
Feb-12	11797000	17.00	10.43
Mar-12	11900000	17.00	10.43
Apr-12	12056000	17.00	11.14

May-12	12183000	17.00	8.28
Jun-12	12316000	16.00	8.87
Jul-12	12413000	16.00	9.07
Aug-12	12532000	16.00	8.88
Sep-12	12597000	16.00	9.19
Oct-12	12672000	16.00	7.8
Nov-12	12746000	16.00	6.37
Dec-12	12861000	13.50	6.16
Jan-13	13006000	13.50	7.3
Feb-13	13186000	13.50	7.03
Mar-13	13346000	13.50	7.29
Apr-13	13514000	13.50	6.13
May-13	13673000	13.50	6.51
Jun-13	13854000	9.50	8.3
Jul-13	14013000	9.50	8.88
Aug-13	14124000	9.50	8.17
Sep-13	14221000	9.50	7.88
Oct-13	14322000	9.50	7.71
Nov-13	14535000	9.50	7.32
Dec-13	14637000	10.25	7.4
Jan-14	14755000	10.25	7.75
Feb-14	14898000	10.25	7.89
Mar-14	15081000	10.25	8.39
Apr-14	15341000	10.25	9.38
May-14	15540000	10.25	9.66
Jun-14	15792000	10.25	9.16
Jul-14	16063000	10.25	9.32
Aug-14	16272000	10.25	9.54
Sep-14	16402000	10.25	8.86
Oct-14	16605000	10.25	8.96

Nov-14	16826000	10.25	9.15
Dec-14	16999000	9.00	8.17
Jan-15	17219000	9.00	7.24
Feb-15	17516000	9.00	7.55
Mar-15	17878000	9.00	7.61
Apr-15	18179000	9.00	7.91
May-15	18498000	9.00	8.09
Jun-15	18783000	9.00	7.2
Jul-15	19075000	9.00	6.81
Aug-15	19242000	9.00	7.14
Sep-15	19436000	9.00	7.95
Oct-15	19710000	9.00	7.58
Nov-15	19959000	9.00	8.1
Dec-15	20128000	9.00	8.81
Jan-16	20232000	9.00	9.58
Feb-16	20395000	9.00	8.78
Mar-16	20622000	9.00	7.46
Apr-16	20852000	9.00	6.57
May-16	21193000	9.00	6.58
Jun-16	21389000	9.00	7.64
Jul-16	21741000	9.00	8.79
Aug-16	21970000	9.00	8.05
Sep-16	22138000	9.00	7.28
Oct-16	22245000	9.00	7.16
Nov-16	22405000	9.00	7
Dec-16	22595000	8.75	8.53

**Table A.4** Final Data Used

Date	Interest Rate	CPI Inflation	GDP	POP	HPI
2010	14.92	8.58	1160013978	72326914	99995
2011	14.25	6.45	1394477166	73409455	110215
2012	16.21	8.94	1569672115	74569867	123079.17
2013	11.23	7.49	1809713087	75787333	138692.5
2014	10.15	8.85	2044465876	77030628	158811.67
2015	9	7.67	2338647494	78271472	188019.17
2016	8.98	7.78	2608525749	79512426	214814.17

## RESUME

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STUDIES APPLIED FOR Master In Business Administration

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09/2015–Present Master in Business Management  
Istanbul Aydin University, Istanbul (Turkey)

09/2008–09/2012 Bachelors Degree in Business Administration and  
Management of Enterprise

University Of Yaounde II Soa, Yaounde (Cameroon)

Strategic Management

Human Resource Management

Game theory

Econometrics

Operational Research

Cooperate Finance

Economic Policy

Creation D'entreprise

Professional Project

Public Economics

09/2006–09/2008

Advanced Level

Mevick Bilingual Gramma School, Etoug Ebe Yaounde,  
(Cameroon)

Economics

Geography

Mathmatics

Philospophy

PERSONA

L SKILLS

Mother tongue(s)

English

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
French	B2	B2	B2	B2	B2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

Common European Framework of Reference for Languages

Digital competence	SELF-ASSESSMENT				
	Information processing	Communication	Content creation	Safety	Problem solving
	Independent user	Independent user	Independent user	Independent user	Basic user

Digital competences - Self-assessment grid