

CONSTRUCTION INDUSTRY AND ECONOMIC GROWTH IN THE REPUBLIC OF TURKEY

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Abstract: *This article consist construction industry in Turkish Republic in various perspectives. First of all we will indicate about the history of the construction industry in Turkey and how an infant industry became World's second largest construction sector. We will mention their footsteps, obstacles, government supports and government relationships between the construction companies. We will also examine the business model agreement used by Turkish Government at inland constructions we will discuss positive and negative outcomes of this model. We will also comment the consequences of the strategic decision done by Turkish Government by choosing construction industry as a locomotive industry for economic and industrial growth. Finally we will argue efficiently of construction industry for sustainable economic growth and sustainable economic development.*

Keywords: *Turkish Republic; construction industry; government; business model.*

JEL Classification: *L74; L78.*

1. Introduction of Construction industry in Turkey

In this research first of all we will define how construction industry started evolve in the Republic of Turkey and the history of the construction industry in the country. We will investigate the economic indicators and define how an infant industry became the main tool for the countries growth and development. We will also demonstrate the impact of the construction industry in the GDP and employment and we will demonstrate the evaluation of the Turkish construction companies in global scene and briefly mention about the internal and external projects built in Turkish Republic or built by Turkish construction company. Furtherly we will describe relationship between economic growth and construction industry within examples from Turkish Republic and further international examples. We will seek for a possible correlation between economic growth (GDP Growth) and the construction industry. We will investigate the fluctuation of trends of economic growth and its possible relationship between construction sector and try to describe cause and effect relationship between them. Finally we will also define built operate transfer (BOT) model briefly mention about BOT model history and investigate why did nations drop off using this model after 18th century and started to re consider it after 1970's. At the very end we will also demonstrate the benefits and risks of the BOT model and compare the successful BOT model application all around the world and Republic of Turkey. At the very first Turkish economy rapidly became a consumption based retail services economy without having any experience of industrialization as a result of neoliberal economic policies followed by the governments since the middle of the 1980s with the support of U.S and NATO membership and the rapid global financialization started up. Current government and previous conservative democrat liberal governments strived for creating an urban rich class which who are willing to

take risk, demands and consumes much than usual patterns. They carried this population through the villages from rural areas with the way of internal immigration. In order to implement this policy they created several obstacles for agriculture industry especially on the production phase and compensated the farmers with the money came from financial aid. With that financial aid many of the farmers decided to sell their lands and move to the urban areas. Although Turkey ironically was not an industrialized country yet therefore economy became a service economy normally.

There are several discussions about construction industry influences the economic growth due to its strong linkages with other sectors of the economy.

During the 1999-2001 Turkey experienced a massive economic crisis. The government at that period was running enormous budget deficits and selling huge quantities of high interest bonds to Turkish banks. Inflation continued to increase, government could avoid defaulting on the bonds in the short term. As a result of this pattern Turkish Banks had to rely on these high yield bonds as a primary investment and additionally government was suffering due to IMF debts which as a normal consequence of all above Turkish Republic experienced this massive economic crisis.

At the year of 2002 new conservative democrat party elected and the rise of construction industry started after this period. We can clearly declare that the new president and government determined construction industry as a locomotive of the economic growth and Turkey's construction industry has been at the pioneer of the Turkish economic development.

Over the last decade industry has renewed the İstanbul and other cities. Public construction was even more widespread than private ones. They renewed and extended Turkey's transport infrastructure and build new facilities especially at Aegean and Caucasus. It is a well-known fact that construction employs thousands directly and also causes growth in related industries. Today we will investigate construction industry as a major tool of economic growth. Despite the economic slowdown in the last 5 years it was a successful tool for more than a decade.

According the TurkStat data at the end of 2014 the construction industry worthed approximately at the that dates exchange value 30-31 billion \$ and this means %4.6 of the GDP. However according to European International Contractors (EIC) claims that if we consider broadly the impact of the industry %30 of GDP attribute and %10 of the working population are employed around the construction industry.

Industry effected from the Global economic crisis by shrinking %18.1 at year 2009 it gave a quick reaction by growing %24.9 at 2010 %26.5 in 2011 in the next 3 years growth of construction industry was %7.6 %11.9 and %14.6 according to TurkStat. However as we will investigate furtherly it will drop massively starting from 2014.

Those numbers obviously indicates us construction industry was the main tool of economic development at Turkish Republic.

Another supportive indicator which proves us the size of the industry is rankings of Engineering News Record (ENR). Out of the 250 top construction companies in the world-wide 42 were Turkish companies; which this number is the largest number at this ranking right after China. Couple of examples of those industries giants are ENKA (52th place / 2.4 \$ billion revenue) Rönesans Construction (53 th / 2.39 \$ billion revenue) the third largest was TAV construction (83rd place globally with. 127 \$ billion overseas revenue) In 2013 ENR gave TAV tittle of second largest airport construction company (based on project it undertook 2012) after U. S based Bechtel.

Those companies carried out 7735 projects in 104 countries between the years 1972-2015. All of above companies are also operating domestically some of key companies are "Çalık Holding " (Current Turkish Minister Of Energy and Natural Resources was former CEO in Çalık Holding company and son in law of the current president Recep Tayyip Erdoğan.) "Cengiz İnşaat A. Ş" and TOKİ (Turkish Housing Development Authority)

Turkey's GDP increased continuously after 2001-2002 period despite the slowdown during 2008-2009 crisis GDP increased yearly %5 according to TurkStat taxes. At the same time foreign direct investment (FDI) in Turkey was grown also as a consequence of this demand for new factories and facilities occurred at that time. In addition population growth also rode an extra demand for construction and all of these elements contributed construction industry to grow up rapidly.

Working overseas experiences for Turkish Companies started in the 1980's Libya, Saudi Arabia and Iraq. Middle East area was vital for the Turkish Construction companies. Middle East territory is constantly experiencing conflicts and wars in every decade for a while. Whenever the conflict ends Turkish Construction Companies will likely be one of the first helping for reconstruction. There are significant opportunities for Turkish Construction companies especially in Middle East, North America and Sub Saharan Africa countries like Iraq, Jordan, Algeria, Libya and Ghana as considerable potential. On the other hand as it is known after 2000's with the rise of gas and oil prices UAE, Saudi Arabia, Qatar developed a lot especially they created new cities and living areas and Turkish Companies also benefited from this and in example Doha Metro in Qatar built by Turkish Contractors Yapı Merkezi and STFA Company. Another example Rönesans Holding largest foreign contractor in Russia generates approximately 2\$billion of their revenue from there. On another level government began a huge urban renewal programme after 1999 earthquake. TOKİ (Mass Housing Administration) renews or strengthen buildings in addition Turkey accomplished to built 2200 km of motorways and the goal is expanding this 9680 km in 2035 according to General Directorate of Highways.

Despite all these projects Turkey has one more advantage at construction industry. Iron and Steel have long been manufactured in the country. According to a Ministry of Economy (MoE) report from 2014 Turkey has 67 cement plants and total production in 2014 was 71.2m tonnes and 63.2 m tonnes used inside of the country and 7.7 m tonnes exported.

2. Construction Industry GDP growth in Emerging Countries

The statistical relationship between construction activity and economic growth was shown to be positive some 1.5 years ago, by the late Professor Duccio Turin and the University College Environmental Research Group (UCERG), as well as by Strassmann in the USA.

As a natural consequence it is considered that the construction industry has a positive impact on national economies by stimulating economic growth. Considering its connection with other sectors and its contribution to employment, economic growth is accepted as a driving force. Therefore governments usually transfuse it is funds to construction industry. In addition to engineering industry, machinery and real estate industry large number of unskilled labor force also gets involve to this activities especially at the spring and summer seasons. Furthermore it is also easy

to enhance employment rates with construction industry. Turkish construction industry has a constantly growing dynamics for decades. Although there are period of year both construction industry and completely Turkish economy depreciated all together.

We could observe the depression from the the main indicators of the Turkish economy such as rapid depreciation in TL, high unemployment, rising inflation, real decline in export figures, the emergence of high debt problems in dwellings, and the reflection of geopolitical developments, the Turkish economic figures depreciated rapidly therefore this also effected the construction industry.

The main factors affecting the growth of the construction sector in Turkey in recent years can be listed as:

1. The planned visa, citizenship, and residence permit facilities for sale of real estate to foreign investors.
2. The safe harbor position of Turkey, as a result of geopolitical development in the region.
3. The mortgage financing system that increases real estate sales.
4. New infrastructure projects that create new interest (Tube passage projects in Istanbul Bosphorus, Third Airport in Istanbul, Osmangazi Bridge, Dardanelles Bridge, and high-speed train projects between Ankara and Istanbul)
5. The fact that Istanbul is a commercial or geographical distribution center (Hub) and the construction of Istanbul's financial center.
6. Urban transformation. (The damaged buildings have the opportunity to be transformed into new and modern constructions.)
7. Urban migration and refugee migration to the metropolis cities.

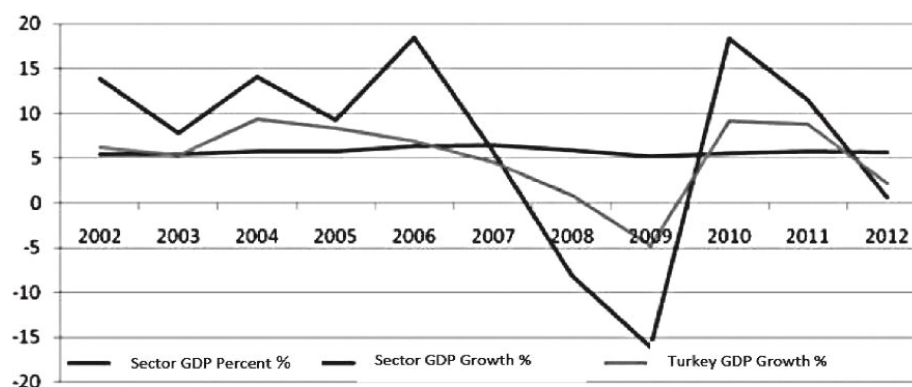
Western European countries has a direct effect on other investments; however, their effects on the economic growth may be indirect (Turin 1973). In Western Europe, the volume of construction in the GDP in 1980 was 10%, compared to 7% in 2004 (Wigren and Wilhelmsson 2007). This research indicated that the economic impact of the construction sector in industrialized Western countries has declined. They preferred to focus on more technology and related industries.

Mallick and Mahalik (2008) investigated the role of the construction industry in the Indian economy and it's impact on economic growth. They emphasize that the construction industry has increased its economic growth strongly when the capital stock does not add up, this contributing to the employment of the construction industry. As employment in the construction industry enhances, output also increases, which in turn increases the economic growth. Although, they emphasize that these effects do not continue in the long-run. Also Tiwari (2011) investigated the relationship between construction investment and economic growth for the Indian economy using the data of 1950-1951 and 2008-2009 periods, for a short and long-term, and found that there is a mutual reason result relationship between construction investment and economic growth. Thus, this suggests that political decision-makers should encourage investments in the construction sector in the short run, but support should be reduced in the long-term. Chang and Nieh (2004) investigated the natural relationship between the construction sector and economic growth in Taiwan. They found that there was co-integration between the construction sector and economic growth. Real estate investments in Turkey are considered safe investment tools in order to keep under control the inflation. Most studies indicate that real estate investment is a protective asset against inflation in the long run. That

is the also main reason why Turkish government resists to increase interest rates even though high pressure they are facing with at currency exchange market in the year of 2018. Therefore you will need to offer low interest rates in order to sell long term housing contracts.

Finally, there is a positive relationship between per capita national income. Infrastructure investments in the construction industry, job creation, and economic development in the short run in the developing countries. Therefore political decision makers supports construction industry as an important tool.

Also according to Keynesian theory, investment – at least building investments – plays important role in the total demand and economic growth in the short run. Due to it's relationship with other industries, it is expected to growth in the construction industry will also trigger the growth in the other industries therefore it will contribute to the total economic growth.



Source: TSI 2013; TSI 2014; TSI 2015.

Figure 1: 10 year general view of the Turkish construction industry:

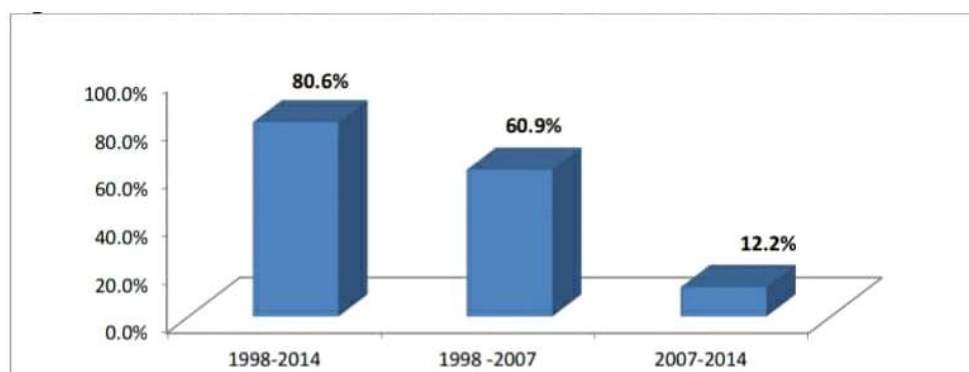
According to Figure 1, there is a similar tendency between economic growth and construction sector. Between growth rate of construction sector and growth rate of GDP, there is a high correlation like 0.93. This confirms that the movements of both indicators in the same direction. STO (State Planning Organization 2010)

3. Contribution of Construction Industry to Economic Growth. Evidences from Turkey.

Studies usually refers construction industry is a vital contributor for Turkey's economic growth.

If you just generally analyze the 2000-2010 period we can see the picture like this although if we investigate slow downs and reasons behind them it will enlightus to understand the whole process. The low interest rate economy (imposed by government) with the help of radical changes in urban legislation and city building boosted up the construction industry at this period at Turkish Republic which created economic growth to Turkish economy. Which government bodies still at 2018 strives to hold interest rates low despite of exchange rate pressure just in order to keep growth of construction industry permanent. But this does not changes the

construction industry have short-term effects on the economic growth all over the world and this could not offer permanent solutions for the economic troubles in Turkey. An increase in residential construction is often linked with enhance employment and income for labour in the real estate industry and also in related sectors that provide goods and services associated with housing (see, for example, Anaman and Osei-Amponsah, 2007; Lean, 2002; Khan, 2008 among others for a detailed discussion). For instance, Anaman and Osei-Amponsah (2007) analyze the causality links between the growth in the construction industry and the macroeconomic growth in Ghana using data from 1968 to 2004. The authors conclude that although the government aimed to use the agricultural industry as the major tool for achieving high growth rates in the agricultural economy although the construction industry needs to be considered as one of the major drivers of economic growth in Ghana. Similarly, Lean (2002) concludes that construction sector leads other sectors' output as well as GDP in Singapore. On the other hand according to Wang et al. (2000) we should consider every countries construction industry and their contribution to general economic growth differently due to their country specific conditions. Bolkol (2015) investigated the causal relationship between construction production (not expenditure) and GDP growth between the first quarter of 2005 and the fourth quarter of 2013 and concludes that there is no long run relationship between construction production and GDP. According to Bolkol choosing construction industry as an engine to economic growth was is not the best alternative for Turkey.



* GDP in Constant Prices by Kind of Economic Activity - at 1998 Basic Prices
Value of construction industry, GDP by Production approach

Figure 2: Cumulative Growth Rate in Construction Activities between 1998 and 2014

The Land Registry Law, the Housing Finance Law and the redrafting of Tax Laws are designed to improve the competitiveness and desirability of the Turkish real estate in the global market in order to enhance the sales. Also several campaigns like providing resident permit and citizenship over a determined amount of real estate investment made countries real estate market even more valuable for Gulf Arabic citizens and many of the real estates also nearly half of the touristic investments purchased by especially wealthy gulf Arabic nations. The pioneer country at this field was Qatar.

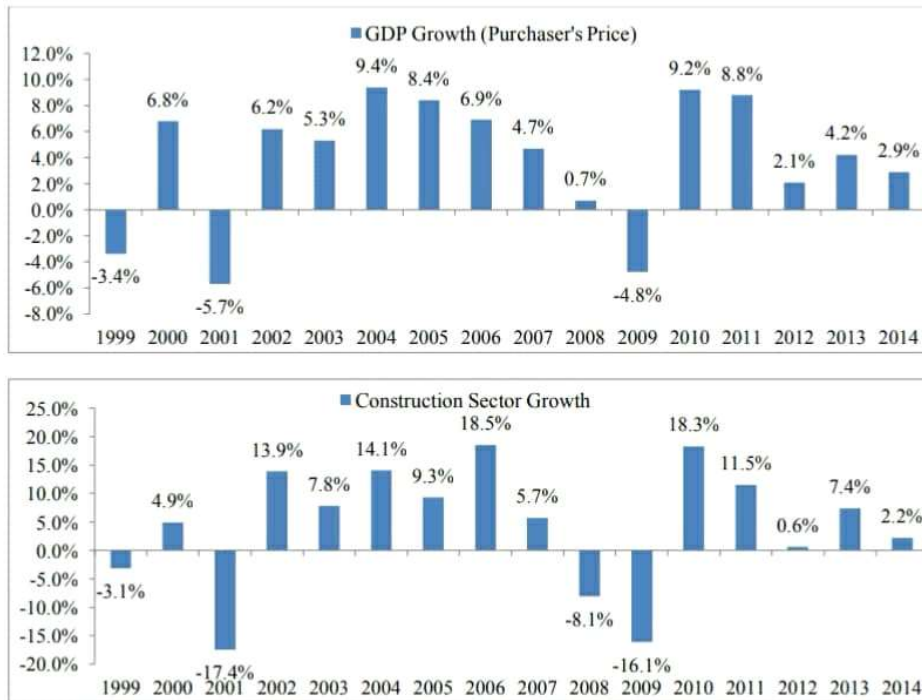


Figure 3: GDP growth; Construction industry growth

Figure 3 related GDP growth and construction industry growth indicates us also construction industry follows the trends and fluctuation in the general economy. It is not changing the trend or shifting economies way during the crissis. So we can not precisely describe construction industry as a game changer for the countries general economic growth. We can observe it seems like it is the follower of the trends more likely.

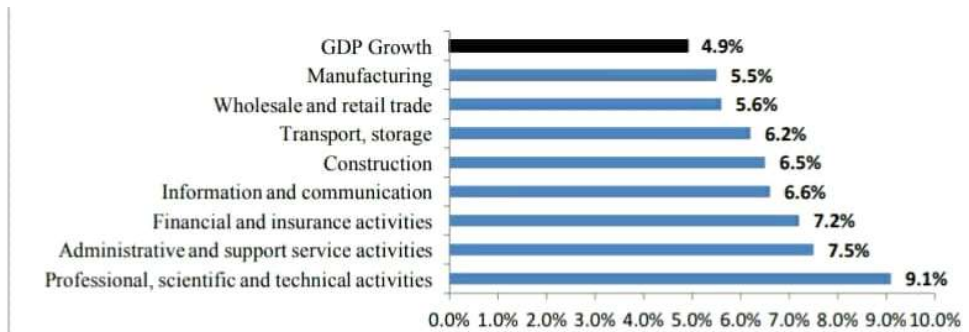


Figure 4: Average Sectoral Growth Rates between 2002 and 2014

In Figure 4 we can observe the sectoral growth rates between 2002-2014 at Turkey. We can define the highest growth we can observe in scientific and technical activities, support activities, financial and insurance activities, ICT and construction.

The one spectacular thing is lowest growth rate we can observe at manufacturing which is not so usual for countries like Turkey who carries affordable labour force. We define 2002-2007 as the catching-up period of the Turkish economy.

After 2001 crisis as a result of medium-term economic goals, strong external relationships with the foreign world implementing IMF programs and the prospect of EU admission and accession, and domestic structural reforms. Macroeconomic stability ensured with strict fiscal and monetary policies designed by former IMF coordinator Kemal Derviş. It complemented by structural reforms in the area of enterprise restructuring and privatization, creating international business environment, liberalize the trade, labor market and in particular by a thorough reform of the banking sector. As a consequence of all those events foreign and domestic investments enhanced rapidly with the international ones and labour productivity also increased with transformation of the economy and real integration process with the EU.

In terms of construction industry, the cumulative growth rate in construction activities reached up to 68.4% during the period of 2002-2007. Sector growth rates of 14.1 percent and 18.5 percent in 2004 and 2006, respectively. This huge growth in construction sector was emphasizing us the demand for real estate developments because of the high-inflation environment throughout the late 1980s and 1990s. 1999-and also earthquake of Marmara region and it's destruction which caused nearly collapse of 133.000 buildings caused an emerge demand for real estate market naturally.

2010-2014 could be defined as another surviving and growing period in the Turkish economy. Therefore economy has recovered very quickly from the global financial crisis of 2008-2009 and reached high economic growth return in 2010. This was a result of strict monetary and fiscal policies and international economic program. In 2010-2011, Turkey had remarkable GDP growth, which reached an annual 9 percent, and it was largely driven by foreign investment, debt-based private consumption (personal debt increased with incentives given to all citizens on using credit cards and personal micro loans. Banking regulation legislated according to enhance spendings) and property investments of both domestic and international construction companies. In addition, the real interest rates experienced the lowest levels of -1.75 % which is very important because in the back of 90's it was on double digit numbers. Real interest rates are vital for the construction industry due to the availability of housing loans (mortgages) which triggers the real estate demands and sales. Therefor the growth rates was 18.3 percent in 2010 and 11.5 percent in 2011. This several researches are both so accurate if we consider the Republic of Turkey and economic depreciation at the last five years. If we investigate the developed countries and their sustainable economic growth we can reach the conclusion that they all supported construction industry in the short term although at the long run they slowly remove their support and gave investors to invest on different and more sustainable working areas which are more innovative like technology related industries.

We can describe construction industry as a train which countries should take for take-off speed for their initial development in order to improve and complete their infrastructure needs and increase their employment rates enhance their GDP and for boosting their economic growth.

Although they should also be aware that they should get off from the train when they achieve their short-term development goals and they should invest their surplus funds to more renewable innovative industries.

4. Major Construction Projects Built in Republic of Turkey

4.1. Osmangazi Bridge:

2682M lenght 4th biggest bridge in the world.

Contractors: Nuroi Construction and Japon IHI

Bridge rented to the contractor companies for all operations for 15 years the total cost of the bridge was 10.3 \$ billion. It started to operation at 30 June 2016.



4.2. Yavuz Sultan Selim Bridge:

This is the third bridge built to the bosporus which connects Asia and Europe.

Contractors were IC ICTS (Turkish) and Astaldi JV (Italian)

Total lenght of the bridge is 2164 M.

Total cost of the project was 3.5 \$ billion.

Contractor companies has all income and operating rights and liabilities of the bridge for 7 years and 9 months period.

Yavuz Sultan Selim Bridge started it's operations at 26/08/2016



4.3. Eurasian tunnel:

Worlds first double decked highway tunnel.

Contractors ATAŞ ve Yapı Centre (Turkish) and SKE&C (South Korea)

Contractor companies has all income and operating rights and liabilities of the tunnel for 24.5 years.

Total cost of the tunnel was 1.245 \$ billion.

According to contractors and Turkish Republic authorities tunnel has resistance for 9.0 magnitude earthquakes.

Euroasian Tunnel started the operations 20 /12/2016 and even now it started to make profit. Current number of Daily pass is around 65.000 cars.

Total cost of the tunnel 300\$million.



Those are the completed projects done in last decade and they are all in operation currently Turkish Republic Minister of Transportation and Communication declared also in his interview that "All other countries and governments around the World envy our business model for those constructions which is private and government supported semi private companies cooperated project practice. This is important because Turkish government did not spend any tax payers money for those projects so none of them constructed by governments budget. "

According to the Minister of Republic of Turkey if they have strived to do this constructions from the governments budget it is nearly impossible to finish them all in the 2 year period.

Personally I agree and appreciate the liberal mindset of government and making those infrastructure without spending tax payers money without borrowing a debt from international institutions.

Liberal mind set and private contractors and businesses should be supported more on government projects in order to make them cost less for the tax payers.

As Mr. Minister also added afterwards after the rental agreement in example 10-25 or 50 year period those projects will still belong to that particular company.

4.4. Continuing construction projects of Turkish Republic:

4.4.1. New Airport of İstanbul:

Contractors are Limak-Cengiz-Mapa-Kolin-Kalyon companies. They will have all income and operation generated by the airport for 25 years time period. This airport expected to ease the air traffic of the İstanbul especially for the transfer flights. Started the construction on 20.05.2013 estimated cost of the project will be 22.152.000.000 EURO.

4.4.2. Channel Istanbul Project:

Project building an artificial channel by dividing the lands of Istanbul peninsula. Estimated total cost is approximately fifteen (15) billion \$.

The main purpose of building another channel despite of the Bosphorus is enhancing the tax income from international trade by imposing tariffs to the vessels the ones which are willing to use this channel.

Turkish government claims that Bosphorus is too slow for international trade size of Turkey and the Bosphorus region. Also Turkish government is not eligible to earn any revenue from Bosphorus due to Montreux Convention of Straits (1936). After this channel constructed Turkish government will have the right for imposing tariffs from the vessels by this way the main purpose is generating some more income.

Debates mostly based on the ecological and environmental effects of this channel construction project. Dividing a peninsula will surely damage the ecological diversity of the region and damage the environment. The other concern is about geological situation of İstanbul and North Marmara fault. It is a well known truth that North Marmara region and İstanbul particularly has an active fault under the land. Therefore before starting the project it is vital to make objective researches about this issue and evaluate the construction according to that the decision should be given. Although all of concerns above according to Prof. Dr. Naci GÖRÜR which he is an expert on sedimentology study field and also dived under 1240m in order to investigate the İstanbul's and North Marmara Regions faults claims that risk of this project is massive. He is claiming that first of all under the water is already polluted enough and there is a massive oceanographic risks of making this project which is related to ecological balance of the sea and the peninsula. He is claiming natural stream of the water will be highly effected due to this project and this may cause more polluted water. (<http://www.milliyet.com.tr/yazarlar/dusunenlerin-dusuncesi-kanal-istanbul-da-cevresel-risk-var--1712652/>)

Despite all of those concerns government officials decided to start the construction at the year of 2019.

On the other hand former Turkish Admiral and former dean of the Turkish Military College Türker Ertürk claims that channel İstanbul project consists high risk due to Montreux Convention of Straits (1936) in aspect of international political relations. He also claims that channel İstanbul project is not really useful project in terms of civil marine trade or international trade. Estimated width will tighter according to bosphorus and channel will also have less depth according to Bosphorus in the planning project. He is concern is about how Turkish government will convince the vessels to use this channel and pay for it. This question is still on the table. According to former Turkish Admiral Türker Ertürk if Turkish government somehow artificially slows down the bosphorus traffic or somehow attempts to force the vessels for

passing the channel and charge it will violate the Montreux Convention of Straits and this violation could cause massive political problems for both Turkey and also for other neighbour states. In terms of violation of the Montreux Convention of Straits it's validity will be debatable and it could even be voided in the worst future scenario. This issue has a massive importance because this convention ensures that only the countries which have the shoreline to the Black Sea could have an military force in the Black Sea. In example in the past couple of years ago between Georgia and Russia conflict U. S could not send a military force even a hospital ship due to Montreux Convention of Straits. Therefore former admiral emphasises that dominating the oceans and seas are always long-term goals of U. S and according to that reminds and asks us about "which country will benefit from channel İstanbul more Turkey or some other foreign countries?"As a result of those different perspectives channel İstanbul should and surely will be discussed more if Republic of Turkey starts the construction in the year of 2019. (Türker Ertürk / <https://odatv.com/kanal-istanbulun-altindan-ne-cikti-0702161200.html>)

4.4.3. Akkuyu Nuclear Power Plant:

The projects construction officially started by Turkish President Recep Tayyip Erdoğan and Russian President Vladimir Putin at the day of 03.04.2018.

Contractor company is Russian State Nuclear Energy Institution.

Estimated cost is 20 billion \$ currently. Radiologic wastes will be under Russian Federation's responsibility. The estimated time of opening is 2023.

The history of the construction began at the year of 2011 with the first topographic ground surveys. All other joint local contractors of the project were chosen by Russian State Nuclear Energy Institution.

Stakeholders of the projects are and their equities:

- a. JSC Atomstroyexport - 2,267%
- b. JSC Inter RAO - 0,820%
- c. OJSC Concern Rosenergoatom - 21,948%
- d. JSC Atomtechenergo - 0,025%
- e. JSC Atomenergoremont - 0,025%
- f. CJSC Rusatom Overseas - 74,915%.

50 Turkish students selected for taking their education and training at National Research Nuclear University MEPhI at Russian Federation. The purpose of this education programme is training capable engineers for running nuclear power plant smoothly. After the graduation those students will do their internship at the ROSATOM Science Tech Centres. (<http://www.akkunpp.com>)

As we can observe that roots of the project has been started at the year of 2011. It is undeniable that Turkish Republic needs additional sources in order to provide cheaper and cleaner energy in order to achieve this goal opening a nuclear power plant is a normal consequence. On the other hand this is also a strategic alliance of two countries. Even though the conflicts Turkish Republic had with the European Union and NATO Turkish Republic chose to sign the agreement. It is also noticeable that nuclear power plant project process accelerated after the unsuccessful coup attempt to the president Recep Tayyip Erdoğan.

Turkish Construction companies expanded overseas:

Construction industry generates %5.9 of the total GDP and employs approximately 2million of the population directly with the complementary sectors the number is 4 million the impact of the of the Turkish economy %30.

The very first expanding overseas of Turkish construction companies started with the Libya port project at the year of 1972.

Currently according to Engineering News Record (ENR) out of 250 top construction companies 42 were Turkish companies as a natural consequence of this Turkish construction companies are one of the important exporter of this industry.

Between the years of 1972-2017 Turkish construction companies operated and completed approximately 9000 projects at 114 countries all around the world.

Let's check some significant examples done by Turkish construction companies made in overseas.

Some major examples of those projects are:

1. *Doha Metro Project (Qatar)*

2. *Awash-Weldia Railway Project*: Awash Weldia railway project will connect 389km area in Ethiopia. Location: Awash, Woldia / Ethiopia

3. *Congress Palace of Equatorial Guinea*: Turkish construction company Tabanlıoğlu Architecture company is liable for the construction of congress palace of Equatorial Guinea at the city of Malabo.

This project completed at the year of 2011. This project also won the best global cultural architectural design award ENR at the year of 2013.



4. *St Petersburg - Moskow M11 Highway, tunnel and bridge projects*: Client is Two Capitals Highway LLC and the contractor ICTAS construction company and contract has been signed at the year of June 2015. Location of the project is St Petersburg / Russian Federation and project is still continuing. Project consists 140km 2x3 and 2x4 laned highway 18 bridges and 46 viaduct and 1 tunnel will be constructed. Estimated cost of this project is currently 3 billion Euro. (<http://www.icholding.com.tr/TR/Insaat/ProjeDetay/53>).

5. Russian Federation Yayva City (Perm) Iraq Electric power plants:



6. Azerbaijan - Baku Olympic Stadium: Client of the project was SOCAR (State Oil Company of the Azerbaijan Republic) and the contractor was Tekfen Construction and Installation Co. Inc.



7. Pristina International Adem Jashari Airport constructed by LIMAK construction at the year of 2013 it completed. The LIMAK company is also currently managing and operating the airport after the construction. The cost of the project was 140 million Euro. (<http://www.limak.com.tr/basin/basinda-limak/2013/kosovayi-dunyaya-limak-terminali-acacak>)



8. *Banja dam and hydroelectric power plant / Albania*: Contractor company is LİMAK construction company. Project started at June 2013 and it completed at the year of 2016 and currently producing electricity for Albania. (<http://www.limak.com.tr/sektorler/insaat/projeler/tamamlanan-tum-projeler/barajlar/banja-baraji-ve-hes-devoll-hidroelektrik-santralleri-arnavutluk>)



9. *Kigali Convention Centre (Rwanda)*: The construction project started with Chinese company but construction could not be completed for 4 years and eventually Rwanda Government decided to resign with Chinese construction. On 16 April 2015 Rwandan Government took a very radical decision by signing the contract with SUMMA and replacing previous contractor with Summa.

At 25th of May, 2016 and the project is completed before even the date promised to the government. (<http://www.summa.com.tr/en/projects/kigali-convention-center-and-hotel.htm>)



5. Built - Operate - Transfer (BOT) Model

Population is increasing day by day and with the new technological improvements vast majority of the population at the developing and developed countries are living at the urban areas and cities. This makes necessity to make new investments to those cities. However financing the investments in infrastructural projects and inadequate financial resources led countries to find new financial models. Built-

Operate-Transfer model allows infrastructure investments and services that countries can no realize with limited budgets to be realized faster and more efficiently with the contribution of the private sector. These projects are naturally high risk investments which requires large amounts of monetary sources. Built-Operate-Transfer method makes these investments available without lending money from foreign resources. Particularly in Turkey this investment tool started to spread up after 1980. There are several kinds of this model:

1. Build-Own-Operate
2. Design-Build-Operate-Transfer
3. Build-Own-Operate-Sell
4. Build-Own -Operate- Transfer
5. Build - Operate - Train - Transfer
6. Design - Build - Finance - Operate
7. Design - Construct - Manage - Finance
8. Lease-Refurbish-Operate-Transfer
9. Rehabilitate-Lease-Transfer

5.1. History of the Built Operate Transfer system:

History of the BOT model goes to 17. century. At the time of British Queen Victoria period BOT method used for electric and water distribution facilities. Governments used the tax payers money for military and government services and use BOT model for infrastructure investments. BOT model started to use at the world after 1800's. The very first record about the BOT model is at the year of 1782 at Paris about water distribution. Water distribution of the city was given to the Perier Brothers Company. After this implementation Italy, Germany, Belgium, Spain implemented this model also.

Afterwards BOT model implemented to the Suez canal at Egypt. Suez canal opened at 1879 and all operations rented to constructor company for 100 years. Also Trans-Siberian railways constructed with same methodology. But suddenly after 1800's till 1970 BOT model did not use for several reasons. The main reason BOT did not used was the World Wars and demolition caused by the wars. Demolition was huge after World Wars therefore the costs of construction were high and political environment was unstable in order to those reasons private sector participation was not feasible at this time period. Also as we remember well after 1929 economic crisis countries were more interested to control the economy therefore private sector investments could not find place for themselves at this time period.

Even though after 1970's after the rise of liberalism and globalism also with fast urban development and rapid increase at the urban population BOT model spread up again.

After 1970's former Yugoslavia state also benefited from BOT model and permitted private companies to produce and sell energy at the Bosnia and Herzegovina area therefore private companies took credit loans and built hydroelectric power plants to this area.

At the similar time period also USA legislated the law which gave permission to private sector to produce and sell the energy.

The main reasons why Built-Operate-Transfer model became popular again:

1. Rapid growth and rapid increase at the population and rapid and unexpected urban development. This also created need for infrastructure investments at the countries.

2. Countries do not have sufficient resources for those infrastructure investments.
3. Countries were willing to make infrastructure investments with political concerns.
4. International monetary credit funds advised to countries to support private sectors after 1980's.

If we return the Turkish history first BOT model announced at the year of 1910 at the Ottoman Empire legislated the law allows BOT model. At 20. and 21. century Ottoman Empire allowed French, German and British companies makes infrastructure investments all around the country. This was expected natural consequence for Ottoman Empire because they were losing wars and they had to accept those capitulations for those states. With those capitulations given to those states and their companies Ottoman Empire was be able to built İstanbul red tram line, tunnel for subways, Haydarpaşa Railway Station and Port, İzmir Port was made by foreign companies with the model of BOT (which is still actively under usage of the society). The very first BOT model at Ottoman Empire was the tunnel at Taksim square for the Pera subway at the year of 1870. It was given to French investor Gavand by Sultan Abdulazeez. Company operated the tunnel for 42 years after the construction.

If we check the Turkish Republic and BOT history first president who mentioned about Built-Operate-Transfer (BOT) and implemented this model was Turgut ÖZAL. He legislated BOT model and during his presidency period Republic Of Turkey benefited from BOT very much. He supported liberalization and globalization sincerely. According to legislation he made "Private sector can build infrastructure and could be able to have right to operate it maximum for 99 years".

The first BOT implementation agreement signed at shopping mall project not in energy field suprisingly. The first BOT agreement of Turkish Republic signed at the year of 1985 for Atakule Tower (Ankara) shopping mall and restaurant (02.08.1985). After this incident private sector intended to built electric power plant and BOT agreement signed for 11 electric power plants with the guarantee of Turkish Treasure guarantee for completion at the year of 1988. Afterwards 21 highway road projects also given to private sector without government treasure guarantee at the same year.

Sides of Built-Operate-Transfer Model:

- The host government and it's legal bodies.
- The local or foreign private investor company or consortium of these construction companies.
- Creditor banks which lends monetary sources for these companies. (If it is necessary).
- International lawyers and legal advisors.
- Insurance companies which investigate those construction companies status and making insurance for host government for these projects.
- With the current law of Turkish Republic a local or foreign company could built and maximum will be able to operate the infrastructure for 49 years time period.

There are several risks when you operate under the BOT model for operating companies:

1. Risks about operation.
2. Market and Income risks.
3. Political risks.
4. Financial risks.

5. Legal risks.
6. Project itself could be risky such as like nuclear power plant.
7. Foreign currency risks.
8. Pricing the services for the infrastructure is also consists risks.
9. Profitability risks.
10. The countries economic and political situation which will receive the investment.
11. Inflation risk.
12. Interest rate risk.
13. Currency exchange risk.

5.2. Possible Advantages and Disadvantages of Built-Operate-Transfer (BOT) Model:

Advantages:

1. If the investor companies are foreign companies that means this investment will bring host country foreign investment and foreign currency.
2. Advanced technology transfer and know - how situation.
3. Decreasing public share in the host economy.
4. Governments are not spending money and not entering under burden of huge international debts.
5. Employment and tax income eventually increases.
6. More quality infrastructure facilities are available for the developing and less developed countries.

Disadvantages:

1. The preparation of the process might be long and complicated.
2. Possible long term threats about countries self protection due to renting infrastructures to foreign countries companies.
3. Possible odd of bankruptcy of the contractor and not completed construction. (Which will cost more to complete it afterwards)
4. After the built and transfer part of the operation it will be transferred to public sector and this may cause enhancing public sector percentage on the economics datas.
5. At the stage of transferring the infrastructure the facility might be battered due to long rent periods.

There are several countries also benefits from BOT model quite much for their infrastructure investments. One of them is Egypt. Egypt built and renewed whole countries airports by using BOT model.

Here are some examples:

1. Marsa Alam Airport (Egypt)
2. Al Alamin Airport (Egypt)
3. Cairo Airport (Egypt)
4. RasSedr Airport (Egypt)

Elshamy A. W (2011) Evaluation of airport projects (BOT) in Egypt (Master thesis) Ain Shams University

Now we will demonstrate some construction projects completed at Republic Of Turkey with BOT model:

1. Yuvacik Barrage
2. Sabiha Gökçen Airport
3. Antalya Airport
4. İzmir Adnan Menderes Airport (International extension)

5. Dalaman Airport ([https://www. icisleri. gov. tr/inceleme-arastirma- raporlari](https://www.icisleri.gov.tr/inceleme-arastirma-raporlari)) Ministry of Interior

If we investigate about the electricity power plants BOT models consist %11.26, percentage of the power plants already transferred to the public is %1.71 completely private energy companies in electric power production industry is %60. 31 so the public electric power plants percentage in the industry is just %26.71.

(Electricity Industry Sectoral Report 2016) [https://www. epdk. org. tr](https://www.epdk.org.tr)

Some massive construction projects Turkish Republic preferred to complete with the BOT model: Eurasia Tunnel, 3. Airport of the Istanbul and Marmara-Aegean highway road infrastructure.

Comparing ATAU (Kazakhstan) and Dalaman (Turkey)airports both constructed under the BOT model:

ATAU (Kazakhstan):

Costs: 31.000.000 \$

Tender year: 2007

Construction Started: 11/9/2009

Rented for: 30 years

Past BOT Experience: No experience

Passenger Type: Industrial passenger

Dalaman (Turkey):

Costs: 134.000.000\$

Tender Year: 2004

Construction Started: 1/7/2006

Rented for: 9 years

Past BOT Experience: Experienced for more than 2 decades

Passenger Type: Touristic passenger

At Dalaman airport Turkish Government gave the constructor company eligibility to operate the airport for 30 years and government guaranteed annually 1. 000. 000 passengers on the other hand Kazakh government gave the constructor company eligibility to operate for just 9 years and did not gave passenger guarantee. Although they guaranteed Kazakhstan government will not give permission to build a competitive airport in the next 30 years after project has been completed.

Furthermore Turkey has more democratic and liberal roots than Kazakhstan. One related incident happened while those projects were on construction process. Turkey provided the freedom the constructor company requested and needed on the other hand Kazakhstan government did not permit for setting up an asphalt plant during the construction also refused the exterior material. That examples define us Dalaman airport was more successful BOT model project with all technical feasibility but Kazakhstan had experienced deficiency at feasibility and some difficulties due to lack of BOT model experience.

As a natural consequence of all above Dalaman airport completed 8 months earlier than expected.

In the Dalaman airport construction companies used credit from 2 German and 1 Turkish bank on the other hand at the Aktua project only consortium used credit. Dalaman airport needed less relationship with the government it was more private sector based Aktau airport project process was much more closely linked to Kazakhstan government. Comparative advantage of Turkish Republic according to

Kazakhstan is Turkey had established legal system about BOT model and has more experience.

Kashef, M. (2011). "Critical Success Factors for Build Operate Transfer (BOT) Projects: Lesson Learned From Airport Projects", Master Degree Thesis, Middle East Technical University

Private Sector Advantages at airport construction (BOT model) and airport operations:

- +Easy project finance.
- +Making profit objective.
- +Airport industry stability.
- +Multipurpose project.
- +Diversity of investment.
- +Diversity risk distribution.

(Elshamy A. W. 2011. Evaluation of airport projects /BOT in Egypt. Master thesis Ain Shams University)

If we summarize about the BOT model it is necessity to use BOT model especially for developing countries due to rapid increase of the population, enhancing technology, governments strive for increasing the wealth created the need of constructing more infrastructure at urban areas. BOT model is much more efficient way for handling long-term massive constructions especially for developing countries with limited budgets.

6. Conclusion

First of all we can refer that Republic of Turkey used construction sector as an engine for economic growth and industrialization. Since before 2000 and even nowadays we can not refer that Turkey has been completed it's industrialization process. There were also many obstacles for implementing global economic policies and lack of legislation for accurate globalisation and EU integration process before 2000. After the conservative party elected at the year of 2002 they have accelerated the globalisation of finance and stock market in order to cope and survive from the economic crisis they have implemented strict monetary policies also restructured the law system in all fields coordinated with the EU law. Furthermore they have also made legislations about privatization process of public administrations in order to make them more efficient and reduce budgetary expenses of government. Within the lights of these information the new conservative democrat government chose construction industry as an engine for the economic growth. We should also consider the effect of the unfortunate Marmara earthquake which caused mass demolition and it was a necessity to reconstruct several cities which were effected from the earthquake massively. We also referred with the lights of these researches Turkish economy became highly relied on construction sector and rapidly became retailed service economy.

We investigated the massive construction projects built in the Turkish Republic within the BOT model and how efficient they are running this model of constructions in all over the country for nearly four decades we also referred the giant construction companies of Turkish republic and their internal and external operations and their economic growth in last decade. We also briefly demonstrated political support in Turkish republic through construction sector and construction operations.

We can describe construction industry as a train which countries should take for take-off speed for their initial development in order to improve and complete their infrastructure needs and increase their employment rates enhance their GDP and useful tool for boosting their economic growth.

Although they should also be aware that they should get off from the train when they achieve their short-term development goals and they should invest their surplus funds to more renewable innovative industries. All developed countries experienced through the same process as we can see at the researches above and they chose to invest more innovative industries mostly on high technology industries. We can give the example of those countries as Germany, Italy, South Korea in the first glance. On the other hand Republic of Turkey decided to persist to keep their prior economic attention on construction industry and even increased the investments at the construction sector. Although as we previously referred construction sector as itself does not have a boosting effect on general economic growth or on the GDP. It does not lift the economic growth at the slow downs. In many cases we have been investigated also in the related graph we referred about Turkish economic growth and construction sectors growth it is clear that we can define construction industry just follows the general trend at the economy. Therefore Republic of Turkey also having economically rough times since 2016 and clearly incapable to keep and control the foreign investment flow and exchange rate parity. Although with the direct impact and order of the current president Recep Tayyip Erdoğan central bank of the Republic of Turkey still persists to hold real interest rate levels relatively low despite of high exchange rate pressure. One of the major reason for all of these efforts above is attracting foreign investor in Turkish market again and particularly for construction industry and real estate market. Although after the coup attempt, enhanced political tensions, sequential elections and the unfortunate terrorist incidents happened in 2016-2017 foreign investors still does not consider Turkey as a safe port except a couple of politically allied Gulf Arabic nations.

In order to escape from this misleading poverty trap continue on the path of economic development all developing countries and their politicians should be vigilant if they also chose or have chosen construction industry as an engine for economic growth. They should be aware that after the remarkable peak point they should re allocate their financial sources to another industry which preferably to more innovative and futuristic industries like bio-technology, ICT or even low skill required textile industry (If countries substructure is inadequate).

Governments should also support those industries with subsidies and incentives in order to keep their economic development sustainable.

References

1. [www.tmb.org.tr](http://www.tmb.org.tr/doc/file/YDMH_mart_2017.pdf) Turkish Contractors Cooperation (Foreign construction services report), http://www.tmb.org.tr/doc/file/YDMH_mart_2017.pdf
2. Engineering News Record (ENR)
3. Turin DA(1973) The construction industry: Its economic significance and its role in development. Building Economics Research Unit, University College London. Wigren
4. Tiwari AK (2011) A causal analysis between construction flows and economic growth: evidence from India. Journal of International Business and Economy 12(2): 27-42.

5. R, Wilhelmsson M (2007) Construction investments and economic growth in Western Europe. *Journal of Policy Modeling* 29(3): 439-451.
6. Mallick H, Mahalik MK (2008) Constructing the Economy: The Role of Construction Sector in India's Growth. *J Real Estate Finan Econ* 40: 368-384. Retrieved from <http://bit.ly/2nFjjnu>
7. Chang T, Nieh CC (2004) A note on testing the causal link between construction activity and economic growth in Taiwan. *Journal of Asian Economics* 15: 591-598.
8. Athens Journal of Mediterranean Studies January 2018 Causality between the Construction Sector and GDP Growth in Emerging Countries: The Case of Turkey By Niyazi Berk, Sabriye Biçen
9. STO(State Planning Organization 2010)
10. Copernican Journal of Finance and Accounting ORHAN ÇOBAN and EMİNE ÜSTÜNDAĞ Selçuk University, Department of Economics and AYŞE ÇOBAN Selçuk University, Vocational School of Social Sciences THE STRUCTURAL ANALYSIS OF CONSTRUCTION SECTOR OF TURKEY AND ITS EFFECT ON THE SELECTED MACROECONOMIC INDICATORS
11. Anaman, K. A., Osei-Amponsah, C. (2007) Analysis of the causality links between the growth of the construction industry and the growth of the macroeconomy in Ghana. *Construction Management and Economics*, 25: 951-961.
12. Bolkol, H.K. (2015) Causal relationship between construction production and GDP in Turkey. *International Journal of Research in Business and Social Science*, 4(3): 42-53.
13. Lean, C.S. (2001) Empirical tests to discern linkages between construction and other economic sectors in Singapore. *Construction Management and Economics*, 19:355-363.
14. Lean, C. S. (2002) Responses of selected economic indicators to construction output shocks: the case of Singapore. *Construction Management and Economics*, 20(6):523-533.
15. Wang, K., Zhou, Y., Chan, S. H. and Chau, K. Q. (2000) Over-confidence and cycles in real estate markets: Cases in Hong Kong and Asia. *International Real Estate Review*, 3(1):93-108.
16. Role of Construction Sector in Economic Growth: New Evidence from Turkey Isil Erol and Umüt Unal 2015 - Munich Personal RePEc Archive(https://mpra.ub.uni-muenchen.de/68263/1/MPRA_paper_68263.pdf)
17. Hürriyet Newspaper / Facts of Bridge, Deniz Zeybek. Interview with the Minister of transportation and communication of Republic of Turkey.
18. Interview with Prof.Dr. Naci GÖRÜR Sedimentology expert, <http://www.milliyet.com.tr/yazarlar/dusunenlerin-dusuncesi/-kanal-istanbul-da-cevresel-risk-var--1712652/>
19. Public newspaper essay of former Turkish Admiral Türker Ertürk / (<https://odatv.com/kanal-istanbulun-altindan-ne-cikti-0702161200.html>)
20. Official website of Akkuyu Nuclear Power Plant, <http://www.akkunpp.com>
21. Contractor companies official website for numerical datas. (<http://www.icholding.com.tr/TR/Insaat/ProjeDetay/53>)
22. Contractor companies official website for numerical datas. (<http://www.limak.com.tr/basin/basinda-limak/2013/kosovayi-dunyaya-limak-terminali-acacak>) (<http://www.limak.com.tr/sectorler/insaat/projeler/tamamlanan-tum-projeler/barajlar/banja-baraji-ve-hes-devoll-hidroelektrik-santralleri-arnavutluk>)

23. Contractor companies official website for numerical datas (<http://www.summa.com.tr/en/projects/kigali-convention-center-and-hotel.htm>)
24. Elshamy A.W (2011) Evaluation of airport projects (BOT) in Egypt (Master thesis), Ain Shams University
25. (<https://www.icisleri.gov.tr/inceleme-arastirma-raporlari>) Ministry of Interior Reports.
26. Energy Market Regulatory Authority, <https://www.epdk.org.tr>
27. Investigation of the model of BUILD-OPERATE-TRANSFER (BOT) in the World and Turkey. Muhammed KARABULUT / Master Degree thesis 2017 / University of Beykent
28. Kashef, M., (2011). "Critical Success Factors for Build Operate Transfer (BOT) Projects: Lesson Learned From Airport Projects", Master Degree Thesis, Middle East Technical University
29. Chou S. J., (2015). Cross-country comparisons of key drivers, critical success factors and risk allocation for public-private partnership projects, 19.01.2015, Department of civil and construction Engineering National Taiwan University of Science and Technology
30. Prieto B., (05.12.2012). Comparison of Design Bid Build and Design Build Finance Operate Maintain Project Delivery, <http://www.pmworldjournal.net>.
31. Walker, C.A.J S., (1998). "Privatized infrastructure", The Built Operate Transfer Approach, Thomas Telford, London.
32. Levy, S. M., (1996). "Build, Operate, Transfer", Paving The Way For Tomorrow's infrastructure, John Willey And Sons Inc., Newyork.
33. Kessides, I.N., "Reforming Infrastructure–Privatization, Regulation, andnCompetition", The World Bank, Oxford University Press, Washington D.C., (2004).