ISTANBUL BILGI UNIVERSITY
INSTITUTE OF GRADUATE PROGRAMS
FINANCIAL ECONOMICS MASTER'S DEGREE PROGRAM

IMPACT OF DISCOUNTED TICKET ADS ON AIRLINES STOCK PRICE: AN EMPIRICAL ANALYSIS FOR PEGASUS AIRLINES

Serkan AY
115620024

Assoc. Prof. Serda Selin ÖZTÜRK

ISTANBUL
2020

ISTANBUL BILGI UNIVERSITY
INSTITUTE OF GRADUATE PROGRAMS
FINANCIAL ECONOMICS MASTER'S DEGREE PROGRAM

IMPACT OF DISCOUNTED TICKET ADS ON AIRLINES STOCK PRICE: AN EMPIRICAL ANALYSIS FOR PEGASUS AIRLINES

Serkan AY
115620024

Assoc. Prof. Serda Selin ÖZTÜRK

ISTANBUL

ACKNOWLEDGMENTS

I'm deeply grateful to my supervisor, Assoc. Prof. Serda Selin Öztürk for her guidance, patience and support. I consider myself very fortunate for being able to work with a very considerate and encouraging professor like her.

I must express my very profound gratitude to my parents Şükran and Ramazan Ay for providing me with unfailing support and continuous encouragement throughout my life. This accomplishment would not have been possible without them.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

CAPM : Capital Asset Pricing Model

LCC : Low Cost Carrier

ICAO : International Civil Aviation Organization

IATA : International Air Transport Association

CASK : Cost per Available Seat Kilometer

ADF : Augmented Dickey Fuller

GFP : Gross Domestic Product

KAP : Public Disclosure Authority

BIST : Borsa Istanbul (Formerly, Istanbul Stock Exchange)

LIST OF FIGURES

Page

LIST OF TABLES

Page

ABSTRACT

Impact of Discounted Ticket Ads on Airlines Stock Price: An Empirical Analysis for Pegasus Airlines

Aviation industry is one of the indispensable components of the global economy which makes possible to connect people, cultures and businesses to the furthest places in the world. Accurate pricing strategy is an important factor in creating value for both shareholders and investors especially for airlines companies which transport passengers. In this study, the impact of discounted ticket ads on airlines stock price with an empirical analysis for Pegasus Airlines for a specific period of time is examined. Since the low-cost carriers' pricing policy is generally dynamic with discounts and promotions due to the business model and the market competition, Pegasus Airlines, which is the leading low-cost carrier in Turkey, is determined as research subject. The Capital Asset Pricing Model (CAPM) is employed to examine the relationship between Pegasus Airlines stock return and discounted ticket ads for given days of the sample campaigns. Additional independent variables, including USD/TL, EUR/TL, Brent oil and Public Disclosure Platform (KAP) announcements, are also included in the CAPM. As a result of the regression estimation, the beta value indicates that Pegasus Airlines stock is less volatile than BIST-100 index. Abnormal return coefficient is positive, indicating that Pegasus Airlines stock performed better than the BIST-100 index, but it is not significant in measuring how much Pegasus Airlines outperform or underperform the BIST-100 index. As a result of the studies made on the CAPM, discounted ticket ads are found to be insignificant on explaining Pegasus Airlines stock return for given research period between 01.10.2018 and 30.11.2019.

Key Words: CAPM; Stock Return; Istanbul Stock Exchange; Airlines Companies; Discounted Ticket Ads

ÖZET

İndirimli Bilet Reklamlarının Havayolu Şirketleri Hisse Senedi Fiyatı Üzerine Etkisi: Pegasus Hava Yolları Reklamları için Ampirik Bir Analiz

Havacılık endüstrisi; insanları, kültürleri ve işletmeleri dünyanın en uzak yerlerine ulaştırmayı mümkün kılan küresel ekonominin vazgeçilmez bileşenlerindendir. Özellikle yolcu taşıyan havayolu şirketlerinde, doğru fiyatlandırma stratejisi hem hissedarlar hem de yatırımcılar için değer yaratmada önemli bir faktördür. Bu çalışmada, indirimli bilet reklamlarının havayolları hisse senedi fiyatı üzerindeki etkisi Pegasus Havayolları örneği üzerinden ampirik bir analizle belirli bir süre aralığı için incelenmiştir. Düşük maliyetli taşıyıcıların fiyatlandırma politikası iş modeli ve pazar rekabeti nedeniyle genellikle indirim ve promosyonlarla dinamik olduğu için Türkiye'nin önde gelen düşük maliyetli taşıyıcısı olan Pegasus Havayolları araştırma konusu olarak belirlenmiştir. Örneklemde yer alan indirimli bilet kampanyaları ve Pegasus Havayolları hisse senedi getirisi arasındaki ilişkiyi incelemek için Finansal Varlıkları Fiyatlama Modeli (FVFM) kullanılmıştır. USD/TL, EUR/TL, Brent petrol ve Kamuyu Aydınlatma Platformu (KAP) duyurularını içeren ek bağımsız değişkenler de FVFM'ye dahil edilmiştir. Regresyon sonucunda elde edilen beta değeri, Pegasus Havayolları'nın BIST-100 endeksinden daha az oynak olduğunu göstermektedir. Pozitif olan anormal getiri katsayısı Pegasus Havayolları hisselerinin BIST-100 endeksinden daha iyi performans gösterdiğini işaret etmesine rağmen şirketin BIST-100 endeksinden ne kadar iyi veya düşük performans gösterdiğini ölçmede istatistiksel olarak anlamlı değildir. FVFM üzerinde yapılan çalışmalar sonucunda, 01.10.2018 ve 30.11.2019 tarihleri arasında Pegasus Havayolları'nın hisse senedi getirisini açıklamada indirimli bilet reklamlarının önemli olmadığı belirlenmiştir.

Anahtar Kelimeler: FVFM; Hisse Getirisi; Borsa İstanbul; Havayolu Şirketleri; İndirimli Bilet Kampanyası

INTRODUCTION

PART 1:

1.1 THE AIM OF THE STUDY

Airline industry has been transformed over the years. Despite economic struggles, recessions, shocks, terrorism and diseases, the number of passengers has risen over the years. Considerable increase on variety of travel options by destinations, cheaper tickets have made new business models possible, frequency of flights and higher standards in terms of safety have benefited to consumers and the economy itself. In addition to the airline consumers who have benefited from these developments, there are also investors who have been making these developments possible.

In the report prepared by (IATA, 2011), it is stated that shareholders of the airlines could not get the value of the risk taken. The number of airlines that generate consistent return on capital that exceeds its cost are very few. In scope of the report, five force framework which is a tool for understanding the competitiveness of the business environment is applied by Michael Porter, who is the creator of the five force method, to understand poor airline profitability through the force of rivalry, new entrants, customer and supplier bargaining power, and the threat of substitutes. In the report, they concluded that the poor profitability in the airlines industry is driven by competition almost solely on price caused by overly fragmented industry.

Ticket prices have a significant impact on airline companies' profitability. In this study, I aimed to examine whether the discounted ticket prices have an effect on the stock investor on the example of an airlines company whose shares are traded on the stock exchange. There have been many research in literature related to advertising expenditure, price promotion and shareholder value such as; the long-term relationship between advertising spending and market capitalization (Joshi &

Hanssens, 2010), the impact of price promotions on the revenue of the firms (Slotegraaf & Pauwels, 2008), the effect of product market advertising on liquidity of the common stock and the breadth of the ownership (Grullon, Kanatas, & Weston, 2004), the effect of advertising activities (in terms of advertising expenditure) on the firms' stock returns both in the short and long run (Chemmanur & Yan, 2019), the perception of the companies' advertising in specific advertising season in terms of stock price performance from the financial investor framework including stakeholders and investors (Kim & Morris, 2003). In my study, I examined the impact of discounted ticket ads on airlines stock price with an empirical analysis for Pegasus Airlines excess stock returns for a specific period of time. Since the low-cost carriers' pricing policy is generally dynamic with discounts and promotions due to the business model and the market competition, I determined Pegasus Airlines, which is the leading low-cost carrier in Turkey, as my research subject. I employed CAPM to examine the relationship between Pegasus Airlines stock excess return and discounted ticket ads for given days of the campaign.

1.2 AIRLINES INDUSTRY IN GENERAL

The airline industry, which is in an indispensable position in terms of the world economy, continues to grow in the long term although it is interrupted from time to time due to economic crises, epidemics and terrorist events. Factors such as the increase in world trade volume, economic growth, development in the tourism sector, increasing city population, globalization, and the opportunity of a faster and more comfortable travel by air transport are the main factors that support the growth of the sector in the world.

Competition conditions within the sector have also changed over time due to the growth of the airlines industry. Competitive tools such as fast transportation, quality service and reasonable prices are among the important factors in determining the preferences of the customers. As a result of the changes in the competitive

environment and conditions in the industry, airline companies continue their activities in a way to meet the demands of the customers.

1.2.1 Cost Factors in the Airlines Industry

Operational and financial management issues are important in airline transportation as they require high capital investment. Especially for airlines operating with the LCC business model, it is important to keep the costs under control in order to keep profit margins at a certain level.

The most common airway cost classification used today is the classification made by ICAO. According to this classification, the costs of airlines are divided into two as operating costs and non-operating costs. Operating costs are the costs directly related to the flight services offered by the airline company, while non-operating costs are costs not directly related to the flight services offered. Fixed costs are costs that do not change depending on the airline's service production level, or in other words that these costs are costs which do not change depending on a specific flight or a series of flights. The costs that vary depending on the level of service production are called variable costs (Uslu & Cavcar, 2003).

When classified in general, fixed costs include fuel expenses, personnel payments, aircraft rents, training expenses, maintenance expenses, insurance expenses while variable costs include operational costs and catering expenses (Öncü, Çömlekçi, & Coşkun, 2010). The most important cost item of airline companies is determined as aircraft fuel. Due to the fluctuating oil prices, the fuel expenses of airline companies change, and this affects the profitability of the companies. In the table below, the cost breakdown of Pegasus Airlines on the basis of Cost per Available Seat Kilometer at the end of 2018 and 2019 is given as an example.

Table 1.1: CASK Segmental Breakdown for Pegasus Airlines in 2019

Cost Items	CASK-€c		Change %	Place in Total 2019 %	Place in Total 2018 %
	2019 12M	2018 12M	YoY		
Jet Fuel Expenses	1,13	1,18	-4%	35%	36%
Personnel Expenses	0,5	0,39	31%	16%	12%
Operating Lease Expenses	0,00	0,31	n.m.	0%	10%
Maintenance Expenses	0,14	0,30	-54%	4%	9%
Depreciation & Amortiz. Expenses	0,56	0,24	134%	18%	7%
Handling Fees	0,26	0,24	6%	8%	7%
Navigation Expenses	0,21	0,20	3%	7%	6%
Landing Expenses	0,11	0,11	7%	3%	3%
Comission Expenses	0,05	0,06	-11%	2%	2%
Passenger Service & Catering Exp.	0,03	0,03	2%	1%	1%
Advertising Expenses	0,03	0,02	55%	1%	1%
Other	0,17	0,18	-10%	5%	6%
CASK-€c	**3,19**	**3,26**	**-2%**	**100%**	**100%**
Non-Fuel CASK-€c	**2,06**	**2,08**	**-1%**	**65%**	**64%**

(Pegasus Airlines, 2020)

CASK is an airlines industry standard for measuring the unit cost. This measurement is frequently used in airlines industry since it allows a cost comparison between different airlines, or cost comparison of a single airline in different time periods. The calculations can be made for different aircraft types for comparing the unit cost of them. In this example, CASK is calculated for a Pegasus Airlines for a particular period of time.

As it can be seen from the Table 1.1, Pegasus Airlines' biggest cost item is fuel expense, which constitutes 35% of the total costs. After the depreciation and amortization, the third highest expense in total costs is personnel expense. In general, the two most important cost items of the aviation industry are fuel and personnel expenses. Since Turkey is dependent on imports for the supply of fuel, managing the fuel costs is of great importance for airlines industry. In addition to

Turkey being dependent on imports for fuel, the airline industry may face additional risks with the fluctuation of TL against other operational currencies.

Airline companies regularly purchase aircraft within the scope of fleet renewal or expansion. Although these purchases are not carried out frequently, they are reflected in the balance sheet as an important expense item due to their costs. Aircraft purchases are generally made in long term due to their high costs, but aircraft can also be purchased through financial leasing.

1.2.2 Issues for Determining Ticket Prices in the Airlines Industry

The price of the airline ticket depends on the complete analysis of some metrics which include costs, supply and demand. At the very heart of the business, costs are the determinant factors on the profit margin which shows how much money your business is making, whether your business is thriving or there are potential problems related to business. So, costs are one of the main determinants of the ticket price. Supply and demand show the behavior of the consumers and the market which provides data related to the price formation from the benefits of the services offered by the airline industry.

Supply and demand are two economic variables which are used to explain the determination of the price in the market for various products and services. While supply stands for the relationship between the prices of goods and services and their availability, demand stands for the number of goods that consumers want to buy at a range of affordable prices in the market. There is an equilibrium point which supply, and demand curves meet on a graph. If we simply explain, companies use supply and demand to determine how much of a product or service they should make and at what price.

The factors which are affecting demand in airlines in passenger transportation are ticket price, competing airlines' ticket prices, income level of passenger, consumer

loyalty, availability of other means of transport, state of the economy, in-flight amenities, frequency of the service, safety, aircraft type together with other random factors (Vasigh, Fleming, & Tacker, 2008). It has been noted that the ticket price (with competing airlines' ticket prices) is the most influential factor on demand especially for price sensitive passengers.

An increase or decrease in airline ticket price affects the demand from customers who are sensitive to ticket price. As a result of increase on ticket price for price sensitive customers, demand for the competing airlines with lower prices or other means of transportation increase.

However, different customer segments such as time sensitive customers are affected by these price variables in different ways. Depending on the customer needs, ticket prices may be important or not. Income level, consumer loyalty and other variables should be taken into account for evaluation.

The analysis of airline ticket price and its determinants is researched by Alves and Caetano in 2016 (Alves & Caetano, 2016) In this study, correlation method is used to verify the effect of ticket price and influencing variables. In general, the aim of this study is to establish the relationship between operating costs, supply and demand. The data used in this study belongs to the Brazilian airline industry from 2004 to 2013. As a result of the study, they conclude that, there is a relationship between airline ticket price and operating costs. However, this relationship is overshadowed by the fact that the relationship between supply and demand is the main determinant in explaining ticket pricing for airlines.

Some problems encountered in the management of costs in the airline industry may arise at the stage of determining the supply-demand balance and pricing of tickets. Fleet planning should be carried out by estimating the medium and the long-term growth trends correctly. Even in the case of tight control of all cost factors and

planning with very advanced methods, sudden drops in the turnover of the sector may occur due to unforeseen events such as epidemics, war and terrorist acts.

1.3 TURKISH ECONOMY IN RECENT YEARS

Turkey is the 18th largest economy in the world with a GDP of USD 755 billion. Between the years 2000-2019, GDP per capita in Turkey has increased from USD 4,200 to USD 9,140 (World Bank, 2020).

Turkish economy shrank due to the global economic crisis which occurred at 2009. The economy, which entered a rapid recovery period in the following years, have continued to grow with fluctuations.

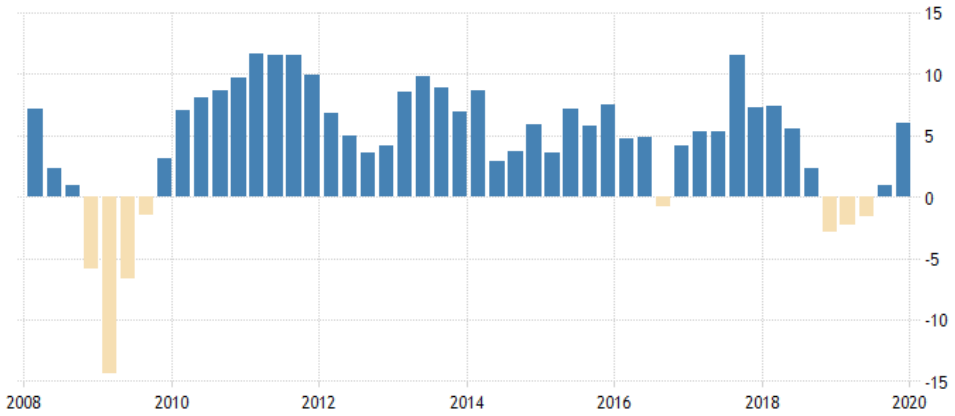
With the effect of geopolitical and political negativities in 2016, growth declined to its lowest level after the global economic crisis in 2009.

With the aim of reviving the economy in 2017, loans were provided, and employment and production incentives were brought to companies to access funding.

The economy slowed down as a result of the uncertainties in the global market and the sharp depreciation of the Turkish Lira in August 2018. A tight monetary policy was implemented by Central Bank of the Republic of Turkey in order to prevent a rise in inflation and negativities in the financial environment in Turkey in 2018.

Although the Turkish economy contracted for 3 quarters since the last quarter of 2018, the economy gradually adjusted after the currency shock of August 2018 in 2019-year end. With the effect of relative recovery in economic activity, it has started a growth trend again from the second half of 2019.

Figure 1.1: Turkish Economy GDP Growth (2008-2019)



(Trading Economics, 2020)

1.4 TURKISH AIRLINES INDUSTRY

Turkey has a strategically significant airspace between Asia and Europe continents. This strategic geographical location secures the control of an important part of the air routes which flow between Asia, Europe and the Middle East. Airlines industry has important contributions to the economy in multiple ways such as domestic and international tourism, supply chain and related spending, flows of trade, jobs created and investment.

Turkey has replaced Ataturk International Airport with Istanbul Airport at the end of 2018 for aiming to be a major hub for international air travel in the world. The aim of the project is to increase the total passenger capacity of the airport. The fact that Istanbul is a natural hub, a transfer point between global routes, enables companies to utilize narrow body airplanes to operate at those routes. The most important contribution of this situation is the remarkable cost efficiency and competitive advantage it creates vis-à-vis other airlines.

In terms of transportation time, flights are usually the best option on some routes, especially if we are to compare flights with transportation by road. Considering

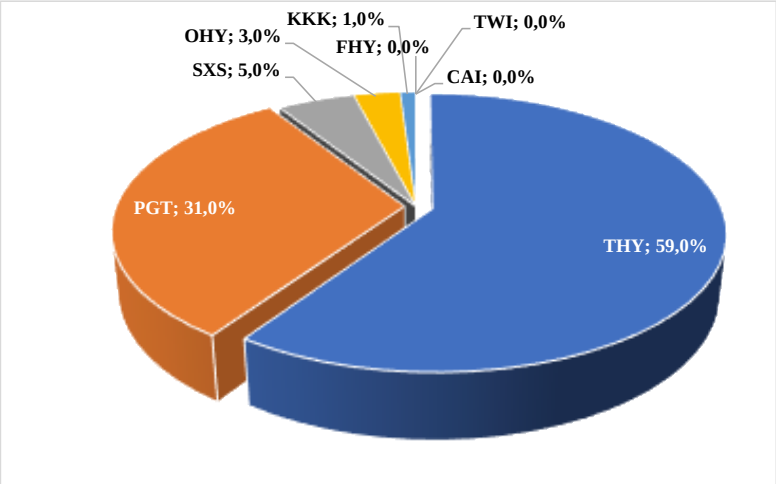
alternative transportation routes, train and sea transportation are not as efficient as airline. Domestic flights stand out as a better alternative for long-distance passenger transportation.

1.4.1 Airlines Industry Market Share in Turkey

There are two main carrier typologies exist for airlines industry which are full-service and low-cost carrier. The companies operating in airlines industry basically belongs to one or the other. However, airlines are generally able to carry out low-cost airline operations under their subsidiaries. Turkish Airlines can be given as an example. While Turkish Airlines operates as the legacy carrier, AnadoluJet which is the subsidiary of Turkish Airlines, operates as low-cost carrier. AnadoluJet carries out international flights as well as national flights.

Turkish airlines industry is mainly dominated by two carriers, namely Turkish Airlines and Pegasus Airlines. In 2018, Turkish Airlines (together with AnadoluJet) served 59% of the market in domestic passenger transportation. The remaining share of the domestic passenger transportation was shared between these airlines: Pegasus Airlines 31%, Sunexpress 5%, Onur Air 3% and Atlas Global 1%.

Figure 1.2: Airline Companies Domestic Passenger Traffic Shares in Turkey for 2018

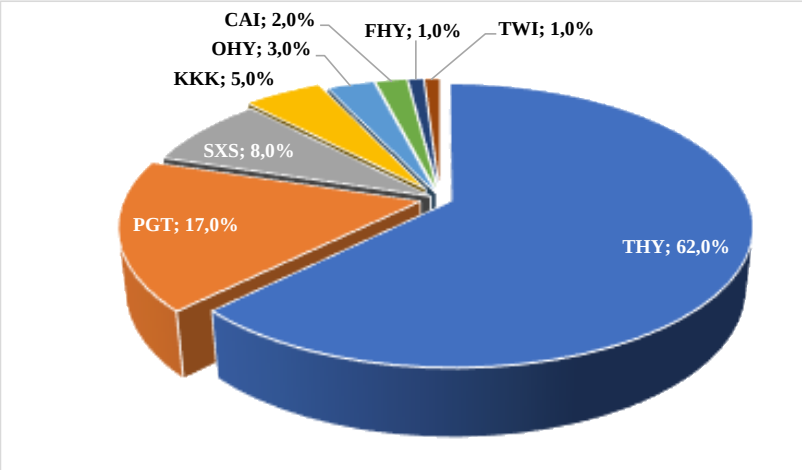


(THY; Turkish Airlines, KKK; Atlas Global, CAI; Corendon Airlines, FHY; Freebird Airlines, OHY; Onur Air, PGT; Pegasus Airlines, SXS; Sun Express, TWI; Tailwind Airlines)

(DHMİ, 2019)

According to passenger traffic shares of 2018, Turkish Airlines carries 62% of all international passenger traffic alone, similar to its share in domestic passenger transportation. On the other hand, Pegasus Airlines has increased its international market share to 18%. Sun Express is the third company with 8% and the share of our other companies varies between 5% and 1%.

Figure 1.3: Airline Companies International Passenger Traffic Shares in Turkey for 2018



(THY; Turkish Airlines, KKK; Atlas Global, CAI; Corendon Airlines, FHY; Freebird Airlines, OHY; Onur Air, PGT; Pegasus Airlines, SXS; Sun Express, TWI; Tailwind Airlines)

(DHMİ, 2019)

As it can be seen by the above figures, Turkish Airlines has dominance in both domestic and international passenger transportation in Turkey. Pegasus Airlines which is a low-cost carrier, is the biggest competitor for both segments to Turkish Airlines in Turkey.

1.4.2 Turkish Airlines in Summary

Turkish Airlines is considered to be the flagship carrier of Turkey thanks to its size and history. Turkish Airlines which has started its operation with 5 planes at 1933, now continues its operation with 350 planes as of 2019 (Türk Hava Yolları, 2020). In the fleet of the company, there are 327 passenger planes which includes 97 wide-body, 230 narrow-body, and 23 cargo planes. It operates scheduled flights within the domestic market as well as to international destinations around the world.

Turkish Airlines is renowned to be the airline that flies to the most countries and the most international destinations in the world. Turkish Airlines has the epicenter at the Istanbul Airport.

The main activity of the company is to carry out national and international passenger and cargo air transportation. Turkish Airlines also provides technical maintenance services to aircrafts. 50.88% of the company's shares were offered to the public. The initial public offering of the Turkish Airlines was made on 1990. 49.12% of the company's shares belong to Turkey Wealth Fund. One C group share belongs to the Privatization Administration of the Ministry of Treasury and Finance.

1.4.3 Pegasus Airlines in Summary

Pegasus Airlines, which started operating in the aviation industry with charter flights at the beginning of 1990, was acquired by Esas Holding at 2005. Pegasus Airlines which is the Turkey's leading low-cost airline has the epicenter at the Istanbul Sabiha Gokcen Airport.

Pegasus Airlines serves 112 destinations (34 domestic and 77 international destinations) in 43 countries. The company has a fleet of 84 aircraft in total, including 39 Boeing and 45 Airbus, as of April 2020.

Despite the intense competition within the sector, especially in the domestic line, it has managed to increase its market share over the years.

Currently, Esas Holding owns the 62.91% shares in Pegasus Airlines in the current situation. A total of 34.53% of the shares are publicly traded on the BIST-100 index. The initial public offering of the Pegasus Airlines was made on 2013. The remaining shares belong to various parties.

PART 2: LITERATURE REVIEW

A large number of studies have been conducted by academics around risk and return in the finance. One of the fundamental subject matter in finance literature is asset pricing. Generally speaking, buyer's willingness is quite decisive on the price of an asset. Although there have been many models for different purposes in finance, the Capital Asset Pricing Model (CAPM) is one of the most famous one among others regarding asset pricing in finance literature. In a very broad sense, the CAPM aims to bring information to investor about the risks and expected return of the financial asset. The Markowitz's Modern Portfolio Theory is extended by the CAPM in both its assumptions and results.

The empirical test of the CAPM's validity with different assets and indexes is one of the much-emphasized topics in finance. Especially, the test of the CAPM for the purpose of to evaluate its ability in explaining risk and return relationship in stock exchange markets is a frequently encountered issue.

Since Markowitz's portfolio theory was published at 1952, portfolio optimization has led to numerous research fields. Further studies in this field related to CAPM were continued by Sharpe (1964), Treynor (1965), Mossin (1966) and Black (1972). Although there is no universal consensus among the academics related to predictive ability of the CAPM, these theories are mainly used for this study. Literature work which is related to this study, different approaches and latest studies done by researchers will be presented in this part.

Evidences related to positive relationship between advertising expenditure and the market value of the firms were provided by Joshi and Hanssens (Joshi & Hanssens, 2010). They analyzed the long-term relationship between advertising spending and market capitalization through Vector-Autoregressive (VAR) model. They used the period of 1991-2005 to obtain monthly financial and non-financial data related to PC manufacturing industry, and period of 1995-2004 to obtain similar dataset

related to sporting goods industry. They found that advertising affects the return of the company stocks. This correlation was beyond the effect of advertising on revenue and profit.

The financial impact on the firm's market value which was caused by new product introduction was researched by Chaney, Devinney and Winer (Chaney, Devinney, & Winer, 1991). They used traditional event study methodology to conduct the study. In this study, firm actions related to new product releases took on the form of discrete interventions. They used the new product introductions between 1975 and 1984, stock returns related to day which new product announcement released and subsidiary accounting information in their study. It was concluded that the reaction of the market to the announcement was related to the number of products announced and whether the product was really new in the market.

The Effect of Firm-Specific News to Stock Performance: Case of BIST-30 Companies is the paper evaluating the effects of the news announced by the companies traded at BIST-30 for the period of January 2003 to December 2012 on the stock performance. The firm specific news related to corporate governance, financial announcements, legal announcements, operational announcements and announcements regarding restructuring were examined in this study. Event study method was used for data analysis. They found that on the day of the incident, it was revealed that investors were most sensitive to announcements related to operational, financial and restructuring (Eyüboğlu, 2014).

Studies related to the impact of price promotions on the revenue of the firms was researched by Slotegraaf and Pauwels (Slotegraaf & Pauwels, 2008). They used panel data from September 1989 to May 1997 from 100 brands across seven product categories. They employed several methodological steps which included Unit Root and Cointegration Tests, Model of Dynamic Interactions, Policy Simulation Analysis and Sequential Regression. The findings showed that it was fairly

common that promotions had positive impact on sales especially for small brands. In addition, brands with higher equity and more product introductions were affected more by permanent and cumulative sales caused by marketing promotions.

The effect of product market advertising on liquidity of the common stock and the breadth of the ownership was examined by Grullon, Kanatas and Weston (Grullon, Kanatas, & Weston, 2004). They used financial and non-financial data for examination over the period of 1993-1999. They employed several methodological steps which included Univariate Analysis, Regression Analysis and Matched Sample Methodology. The findings showed that as the firms spent more on advertising in the case of ceteris paribus assumption, it caused the attraction of larger number of investors to the company stocks.

The effect of advertising activities (in terms of advertising expenditure) on the firms' stock returns both in the short and long run studied by Chemmanur and Yan (Chemmanur & Yan, 2019). Furthermore, they linked this effect to the investor attention argument. They used financial data covering the period of 1996 to 2005. They employed Fama-French Factor Model and various benchmarks to analyze the impact of advertising on stock returns. They concluded that, the greater the amount of advertising expanditure is linked with larger stock return for the advertised year. However, stock return started to diminish after the first year.

The perception of the companies' advertising in specific advertising seasons in terms of stock price performance from the financial investor framework including stakeholders and investors studied by Kim and Morris (Kim & Morris, 2003). The sample of Super Bowl advertisements related to 35 companies for the years which include 1998, 1999 and 2000 were chosen for examination purpose. To explore relationship between stock price performance and consumer behavior, Ad-Meter score was used. This analysis addressed whether investors viewed advertisement from the perspective of the customers. They also used financial and non-financial

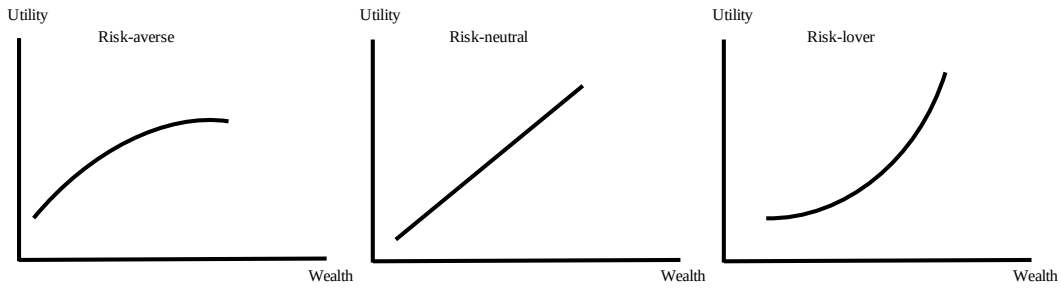
information related to companies. Event-study method was employed to analyze the effect of advertising on the company's stock price. The findings showed that advertised companies had significantly different stock price performance compared to the pre-advertisement period for the sample customers.

PART 3: METHODOLOGY

Investing in markets is all about risk and return. There is no investment which is inherently completely safe. However, not all human beings want to take huge risks with their hard-earned money. Portfolio management theories put investors into categories based on the appetite for risk. Identifying investor types helps us to interpret the consequences of investments. Financial investors are commonly categorized in three types: risk averse, risk neutral and risk lover.

- Risk-averse (or risk-avoiding) investor is an investor who prefers lower returns with known risks rather than higher returns with unknown risks.
- Risk neutral investor is an investor who ignores the risk completely when making an investment decision.
- Risk lover (or risk-seeker) investor is an investor who prefers an investment opportunity with an uncertain consequence rather than one with the same expected returns and certainty that he/she will be delivered.

Figure 3.1: Utility Functions



In the paragraph above, I have briefly summarized the relationship between risk and investor. In order to explain the model that I employed in my thesis; I will briefly explain the theories in portfolio management in the following paragraphs chronologically.

The term portfolio refers to a collection of assets or investments held by financial institutions, investment firms, hedge funds or individuals which may include cash or cash equivalents, government or company bonds, stocks, precious metals and properties. In general, the aim of the construction of the portfolio which consists of different securities or other assets is to earn investment gain. Deciding the asset allocation while construction of the portfolio is related to risk tolerance of the investor. The aim of the asset allocation is to maximize the expected return and minimize the risk. Risk tolerance of the investor is one of the most important factors in deciding asset allocation.

The main purpose of creating a portfolio is to increase the number of assets invested and distribute the risk. There are studies on this subject in the literature. Traditional Portfolio Theory and Modern Portfolio Theory can be given as building blocks of the portfolio theories.

It is thought that the risk will be reduced by increasing the number of securities in the portfolio in the Traditional Portfolio Theory. The aim of this theory is to maximize the benefits that the investor will provide. Portfolio return is the sum of the dividends of the securities that constitute the portfolio and the increase in value in a certain period. The main purpose of creating a portfolio is to distribute the risk. Since the returns of the securities forming the portfolio will not move in the same direction, the risk of the portfolio will be smaller than the risk of investing in a single security. It is assumed that, with the increase in the number of securities, the portfolio risk will decrease significantly and approach the systematic risk level in the market.

3.1 MODERN PORTFOLIO THEORY

Harry S. Markowitz, who is considered to be the founder of the Modern Portfolio Theory, argued the possibility of designing an ideal portfolio which would provide the investor maximum returns by taking on the optimal amount of risk in his article 'Portfolio Selection' published in 1952. In its essence, he asserted that the investors could reduce their portfolio risk through diversification using a quantitative method. He won the Nobel Prize at 1990 for his contributions to the financial economics and corporate finance fields with his essay "Portfolio Selection" (1952) and later more extensive study "Portfolio Selection: Efficient Diversification" (1959).

The risk component of MPT can be measured and reduced via the concept of diversification. The aim of the diversification is to properly choose a weighted collection of assets that together exhibit lower risk than any individual asset. As a core concept of the MPT, diversification is relying on the conventional wisdom of "never putting all your eggs in one basket" (Fabozzi, Gupta, & Markowitz, 2002)

MPT has assumptions related to markets and investors. Some of the main assumptions of the Markowitz's Portfolio Theory are as such:

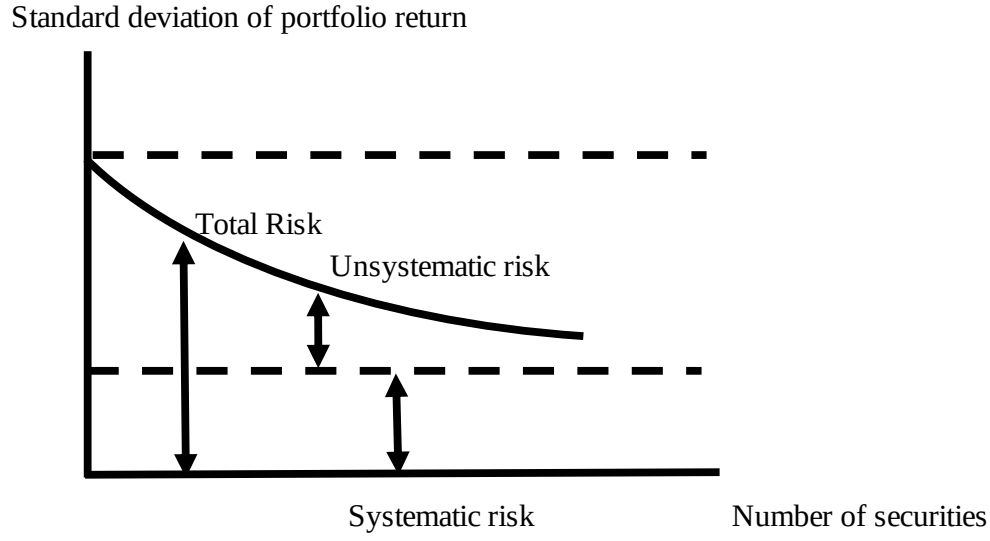
- All investors are rational, so they seek to maximize returns while minimizing risk,
- Investors' decision is only affected by return and variance,
- All investors are only willing to accept higher amounts of risk if they are compensated by higher expected returns,
- All investors timely receive all pertinent information related to their investment decision,
- Markets are perfectly efficient and do not include transaction costs or taxes,
- It is possible to select securities whose individual performance is independent of other portfolio investments.

3.1.1 Risk and Return

In general, all investments include some risk which limits investment gain or may even lead to the loss of capital. These risks can change depends on the nature of portfolio which you invest your capital depending on volatility risk, exchange risk, inflation risk or business risk etc. This concept generally referred as risk-return relationship in literature.

- Systematic risk refers to market risk which cannot be diversified such as changes in interest rates, fluctuations on exchange rates, inflation etc. This risk is also known as common risk.
- Unsystematic risks refer to risk specific features of an asset such as decreasing revenues related to a stock, change on management etc. This risk is also known as diversifiable risk.

Figure 3.2: Systematic and Unsystematic Risk

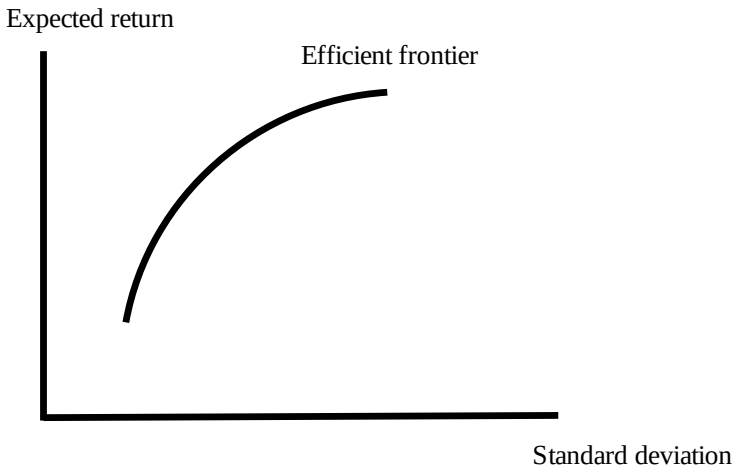


3.1.2 Efficient Frontier

Markowitz introduced efficient frontier theory in 1952 as one of the key concepts of MPT which represents the set of portfolios that offer the best combination of

securities producing the highest expected return for a given risk level or the lowest risk for a given level of expected return. The portfolios which maximize returns for the given level of risk assumed are graphically represented by the efficient frontier. The investment combinations which constitute the portfolio determines the investment return. The risk is synonymous with the standard deviation of a security. As the covariance between securities which constitute portfolio lower, the portfolio standard deviation results lower as well. Efficient frontier does not move in straight line, rather in a curve, providing diversification. Since the portfolios which lie under the efficient frontier do not provide sufficient return for the given level of risk compared to other portfolios, they are sub-optimal. Furthermore, since the portfolios which cluster at the right of the efficient frontier have higher level of risk compared to other portfolios for the defined rate of return, they are also sub-optimal. (Investopedia, 2020)

Figure 3.3: Efficient Frontier



3.2 CAPITAL MARKET THEORY

The Markowitz's portfolio theory was extended with the work of William Sharp who examined the implications of introducing a risk-free asset to Modern Portfolio Theory in the mid of 1960s's. Although William Sharpe was generally credited with developing the theory, John Linter and John Mossin also developed similar models

independently. This theory is an important aspect in decision making process for investors on security prices. The Capital Market Theory demonstrates the trade-off between security returns and risk that should exist if the portfolio is constructed according to Modern Portfolio Theory. Some of the main assumptions of the Capital Market Theory are as such:

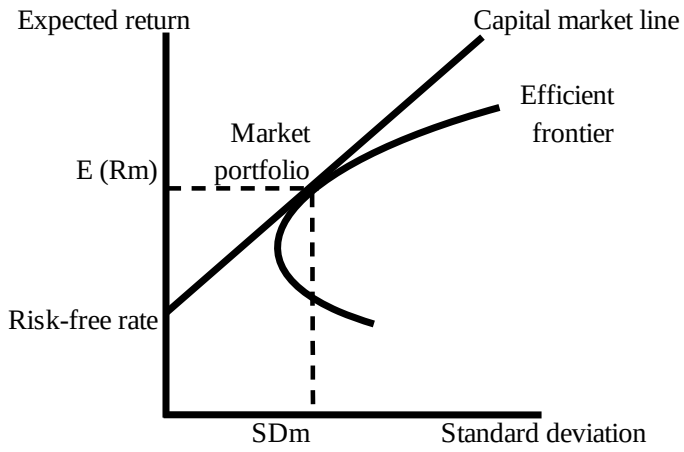
- All investors choose investments on the basis of expected return and risk which mean they are all on the Markowitz efficient.
- All investors can borrow or lend any amount at a risk-free rate of interest.
- All investors have homogeneous expectations for returns.
- Capital markets are in equilibrium and there is no transactions costs, taxes or inflation.

3.2.1 Capital Market Line

Capital Market Line is a graph which shows the portfolios that optimally combining all possible risk and return between the market portfolio and risk-free asset. The most prominent difference of Capital Market Line from the Efficient Frontier is that it includes the risk-free asset since Efficient Frontier represent all possible combinations of efficient portfolios which include only risk asset in varying proportions.

The intercept point of the Capital Market Line and Efficient Frontier is called Market or Tangency Portfolio. Given the Capital Market Theory assumptions, Tangency Portfolio is the most efficient portfolio.

Figure 3.4: Capital Market Line and Efficient Frontier



3.3 CAPITAL ASSET PRICING MODEL

Capital Asset Pricing Model is a general equilibrium model which was studied independently by Treynor (1961-1962), Sharpe (1964) and Linter (1965). Capital Asset Pricing Model evolved on the model of portfolio choice developed by Markowitz (1959). Efficient Frontier and Capital Market Line concepts, which were mentioned in previous sections, were improved by Sharpe in his work written in 1964. He later won the Nobel Prize for his work in developing models to aid investment decisions.

Capital Market Theory was extended by the Capital Asset Pricing Model that investors could evaluate the risk-return exchange for both portfolios and individual security. Capital Asset Pricing Model redefined the risk from total volatility to undiversifiable part of the total volatility through beta coefficient. Beta calculated the systematic risk of individual securities in comparison to market portfolio. It was used in the model as measure of volatility in comparison to the whole market portfolio. Sharpe (1964) stated in his study that the expected return of a portfolio depended on its systematic risk or beta. Some of the main assumptions of the Capital Asset Pricing Model are as such:

- The market is perfectly competitive that investors have no ability to influence the price on their own. They are price takers.
- All investors have the same plan for one-period horizon which usually named as myopic behavior.
- All investors make investment decisions based on the basis of risk and return.
- There is no friction in the market such as taxes or transaction costs.
- All investors can lend or borrow any amount at risk-free rate.
- All investors analyze securities in the same way and have the homogenous expectations regarding future expected returns, correlations and volatilities. Investors share the same economic view of the market and all information is available to them at the same time.

3.3.1 Beta

The relationship between risk (more specifically the systematic risk) and expected return for securities is described by the beta in Capital Asset Pricing Model. A security's beta is calculated by dividing the covariance of the security's returns and the market's returns by the variance of the market's returns for a specified time period. Beta is used in finance to figure out if the stock is in the same direction as the rest of the market or not. The interpretation of the beta is given below:

- Beta = 1 means that the volatility of the market will be reflected exactly by the security.
- Beta > 1 means that the volatility of the security is more than the market.
- 0 < Beta < 1 means that the volatility of the security is less than the market.
- Beta = 0 means that the volatility of the market will not be reflected by the security. It means they are uncorrelated.
- Beta < 0 means that the security is negatively correlated to the volatility of the market.

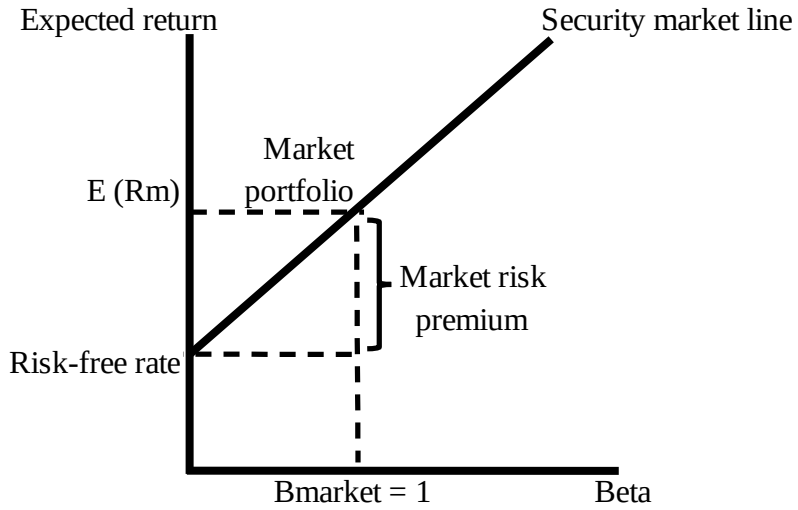
3.3.2 Security Market Line

Security Market Line can be defined as the visualized graphical representation of Capital Asset Pricing Model. Since Capital Asset Pricing Model describes the risk-return relationship between securities, horizontal axis of the Security Market Line represents the expected return, vertical axis of the chart represents the systematic risk or market risk in terms of beta. Security Market Line is defined as given equation:

$$E(R_i) = R_f + \beta_i \, [E(R_M) - R_f]$$

The slope of the Security Market Line is equal to the market risk premium which means expected market return exceeds the risk-free rate and reflects the risk-return trade off at a given time. It is assumed that the investors are risk averse, therefore a premium is expected by investors in exchange for the volatility of a higher risk investment. With the assumptions which are stated at previous section, Security Market Line covers the whole capital investments in the world.

Figure 3.5: Security Market Line



3.4 THE MODEL

The aim of this dissertation is to research on the impact of discounted ticket ads on airlines stock price with an empirical analysis for Pegasus Airlines.

The Capital Asset Pricing Model, denoted CAPM, is used for this research. The classical version of the CAPM can be seen in the given formula:

$$(r_{it} - r_{ft}) = \alpha_i + \beta_i\,(r_{mt} - r_{ft}) + \epsilon_{it}$$

Where:

r_{it} = the rate of return on asset i (or portfolio) at time t,

r_{mt} = the rate of return on the market portfolio at time t,

r_{ft} = the risk-free rate at time t,

α_i = intercept term of stock,

β_i = the beta of stock I,

ϵ_{it} = the random disturbance term in the regression equation at time t.

The extra variables have been added to classical CAPM model to explain relationship between them. In my airlines industry research, I have found out that the most important factors affecting the share price of airline companies are public announcements, currency and oil prices.

$$r_{it} - r_{ft} = a_i + \beta_i(r_{mt} - r_{ft}) + \beta_{eur} r_{eurt} + \beta_{usd} r_{usdt} + \beta_{oil} r_{oilt} + \mu_{campaign} D_{campaignt} + \delta_{kap} D_{kapt} + \epsilon_{it}$$

3.4.1 Pegasus Airlines Stock Return Calculation

Pegasus Airlines stock return is calculated by subtracting closing day(t) price of the stock from closing day(t-1) price of the stock and logarithmic return of both days are taken as below formula:

$$r_i = \frac{\log \text{Closing Stock Price}_t}{\log \text{Closing Stock Price}_{t-1}}$$

3.4.2 Risk-Free Interest Rate Calculation

Central Bank of the Republic of Turkey (CBRT) 1-year bond price is converted to the daily rate to calculate the risk-free interest rate in order to be able to compute the excess return for the stock and the market. The logarithmic return of the daily risk-free rate is given as below formula:

$$r_{ft1} = (1 + r_{365})^{\frac{1}{365}} - 1$$

$$r_{ft} = \log r_{ft1}$$

3.4.3 BIST-100 Index Return Calculation

BIST-100 index return is calculated by subtracting closing day(t) BIST-100 index from closing day(t-1) BIST-100 index and logarithmic return of both days are taken as below formula:

$$r_{mt} = \frac{\log \text{BIST100 Index Closing}_t}{\log \text{BIST100 Index Closing}_{t-1}}$$

3.4.4 Pegasus Airlines Stock Excess Return Calculation

Excess return for Pegasus Airlines stock price is calculated by subtracting daily logarithmic risk-free interest rate of CBRT 1-year bond price from Pegasus Airlines stock return.

$$r_{it} - r_{ft}$$

3.4.5 BIST-100 Index Excess Return Calculation

Excess return for BIST-100 index is calculated by subtracting daily logarithmic risk-free interest rate of CBRT 1-year bond price from BIST-100 index return.

$$r_{mt} - r_{ft}$$

3.4.6 Brent Oil Return Calculation

Brent oil return is calculated by subtracting closing day(t) price of the Brent from closing day(t-1) price of the Brent and logarithmic return of both days are taken as below formula.

$$r_{oilt} = \frac{\log \text{Closing Brent Oil Price}_t}{\log \text{Closing Brent Oil Price}_{t-1}}$$

3.4.7 USD/TL Return Calculation

USD/TL return is calculated by subtracting closing day(t) price of the USD/TL from closing day(t-1) price of the USD/TL and logarithmic return of both days are taken as below formula.

$$r_{usdt} = \frac{\log \text{Closing USD/TL Price}_t}{\log \text{Closing USD/TL Price}_{t-1}}$$

3.4.8 EUR/TL Return Calculation

EUR/TL return is calculated by subtracting closing day(t) price of the EUR/TL from closing day(t-1) price of the EUR/TL and logarithmic return of both days are taken as below formula.

$$r_{eurt} = \frac{\log \text{Closing EUR/TL Price}_t}{\log \text{Closing EUR/TL Price}_{t-1}}$$

3.4.9 Campaign Dummy

Campaign Dummy has been added as given below. A comprehensive description is given in the Data section.

$D_{campaignt}$
$= 1$ if there is a campaign made by Pegasus Airlines on the day t and 0 otherwise.

3.4.10 KAP Dummy

KAP Dummy has been added as given below. A comprehensive description is given in the Data section.

D_{kapt}
$= 1$ if there is an announcement made on KAP on the day t and 0 otherwise.

PART 4: DATA

All data used in the CAPM model are presented in the following subsections.

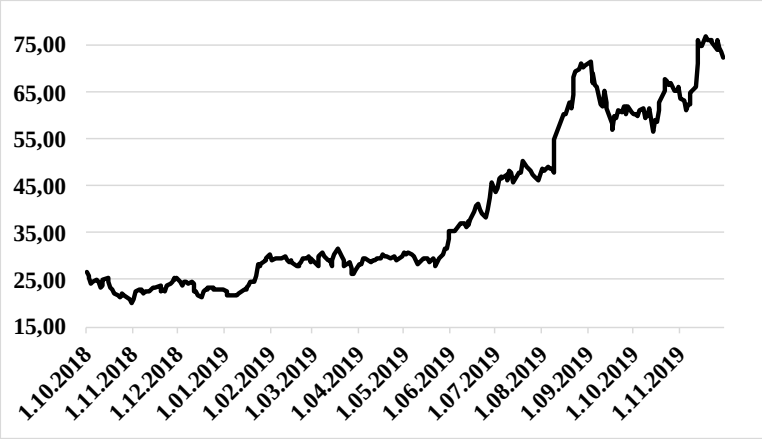
4.1 PEGASUS AIRLINES STOCK PRICE AND BIST-100 INDEX

The data of the dependent and independent variables used in the model was proceeded by taking the log return. Since the model was built on Pegasus Airlines stock excess return, it was been computed by taking log return on Pegasus Airlines stock price and BIST-100 index.

The closing prices at the end of the day for both stock and index were obtained by Bloomberg Terminal for research period between 01.10.2018 and 01.11.2019. The figures related to stock price and index change given below were prepared in Microsoft Excel. CAPM model were studied and results were obtained on the Eviews.

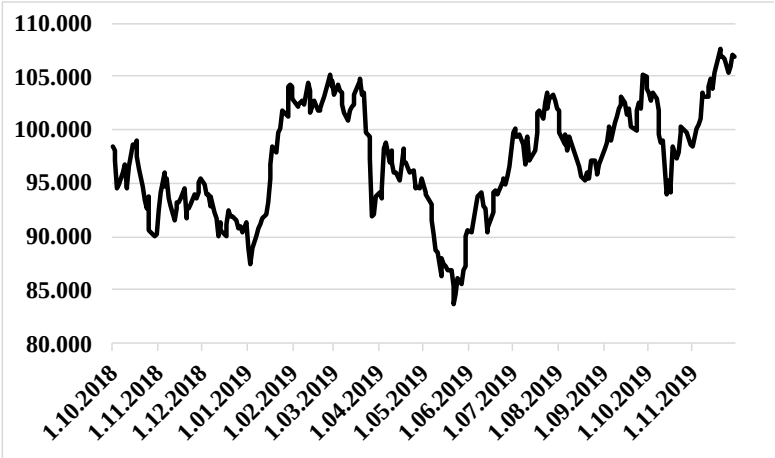
Central Bank of the Republic of Turkey 1-year bond price was converted to the daily rate to calculate the risk-free interest rate in order to compute the daily excess return for the stock and the market.

Figure 4.1: Pegasus Airlines Daily Stock Price for Research Period



(Bloomberg L.P., 2019)

Figure 4.2: BIST-100 Index for Research Period



(Bloomberg L.P., 2019)

4.2 USD, EUR AND BRENT OIL

The closing prices at the end of the day for both EUR/TL and USD/TL were obtained by the Central Bank of the Republic of Turkey Electronic Data Delivery System for research period between 01.10.2018 and 01.11.2019. Since there were two different rates (sell and buy), exchange rates were determined by average of sell and buy rate. Brent oil prices were obtained by Investing web site. The figures related to price change given below were prepared in Microsoft Excel. CAPM model were studied and results were obtained on the Eviews.

Due to the fact that the foreign currencies (USD and EUR) were volatile in the period of the thesis study, it was computed by receiving a log return.

There are academic studies in literature devoted to the analysis of energy markets to investigate the impact of changes in exchange rates on oil prices. The impact of changes in the USD/EUR exchange rate on crude oil was investigated by Breitenfellner and Cuaresma (Breitenfellner & Cuaresma, 2008). They provided evidences that USD/EUR exchange rates did matter in forecasting commodity prices for given research period. Although the causality aspect being uncertain, oil price forecasts were improved significantly by the exchange rate information. They aimed to explain the negative correlation between USD/EUR exchange rate and crude oil prices with five possible channels: the purchasing power of oil export revenues for suppliers and local prices in non-U.S. dollar regions for demand side, investments in crude oil-related asset markets, the monetary policy regime in oil-exporting countries and the efficiency of the currency market.

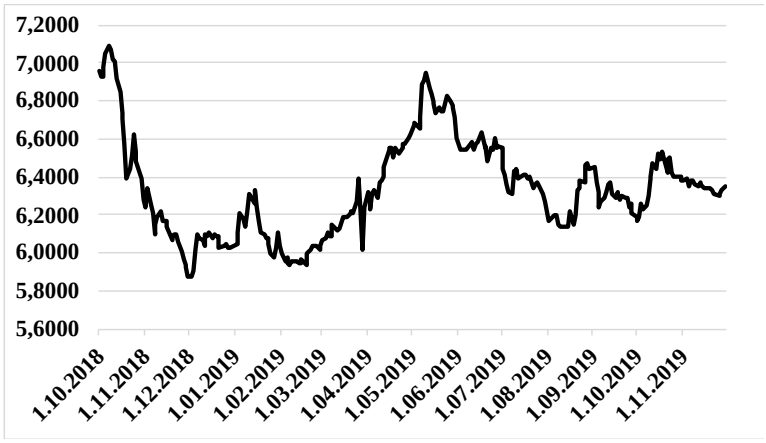
Given the relationship between oil price and exchange rates, Brent Petrol data was computed by receiving a log return to be consistent with USD and EUR data.

Central Bank of the Republic of Turkey 1-year bond price was converted to the daily rate to calculate the risk-free interest rate in order to be able to compute the daily return for the USD/TL, EUR/TL and Brent oil.

Figure 4.3: USD/TL Exchange Rate for Research Period

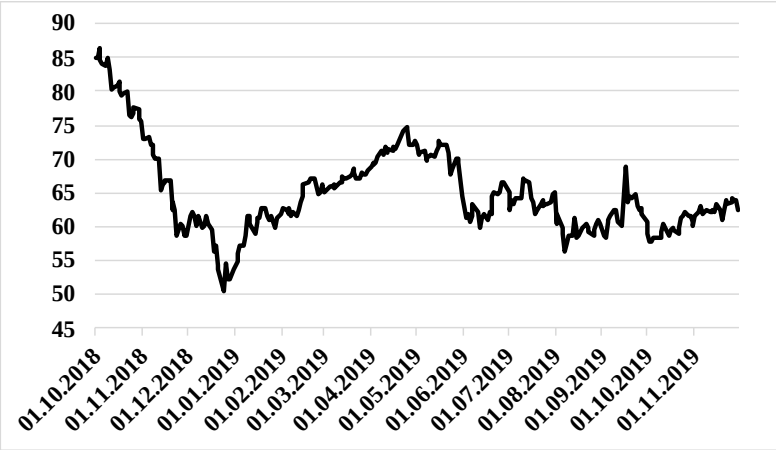
(TCMB, 2019)

Figure 4.4: EUR/TL Exchange Rate for Research Period



(TCMB, 2019)

Figure 4.5: Brent Oil/USD Price for Research Period



(Investing, 2019)

Augmented Dickey Fuller test was performed at level for all three raw data. ADF is a statistical test designed to test whether a given time series is stationary or not. It is one of the most frequently used statistical tests in stationary analysis of a series. ADF test is essentially a statistical significance test that there is a hypothesis testing involved with a null and alternate hypothesis and as a result a test statistic is computed, and p-values get reported. From the test statistics and the p-value, you can draw an inference whether a given series is stationary or not.

As a result of the ADF test, we do reject the null hypothesis (the data needs to be differenced to make it stationary) at %5 and %10 critical values for the Brent Oil. However, we do not reject the null hypothesis at %1 critical value. We do not reject the null hypothesis at all critical values (%1, %5 and %10) for USD/TL. Although we do reject the null hypothesis at %10 critical values, we do not reject the null hypothesis at %1 and %5 critical value for EUR/TL. Test results are given at Table 4.1 below. As a result, it was considered necessary to use all three data with log returns.

Table 4.1: ADF Test Results for Brent Oil, USD/TL and EUR/TL Raw Data

			t-Statistic	Prob.*
Brent Oil	ADF test statistic		-2,9469	0,0414
	Test ciritical values	1% level	-3,4530	
		5% level	-2,8714	
		10% level	-2,5721	
USD/TL	ADF test statistic		-1,9785	0,2963
	Test ciritical values	1% level	-3,4527	
		5% level	-2,8713	
		10% level	-2,5720	
EUR/TL	ADF test statistic		-2,5871	0,0968
	Test ciritical values	1% level	-3,4527	
		5% level	-2,8713	
		10% level	-2,5720	

Note: *MacKinnon (1996) one-sided p-values.

ADF test was performed again at the level of all three data with log returns for the reasons detailed above. As a result of taking log return for all variables, we can conclude that null hypothesis can be rejected at given %1, %5 and %10 critical values. To sum up, given series are stationary at the end of the process.

4.3 CAMPAIGN DUMMY VARIABLE

At the time of the thesis study, all advertisements that can be accessed retrospectively in the campaigns section of the Pegasus Airlines website have been selected as the main mass. Outdated campaign information that is still published until certain date is excluded as actual campaign time has passed

According to the Pegasus Airlines website, there are two different date ranges, namely “sales date” and “flight date” for ticket campaigns. Sales dates refer to the dates when customers can purchase discounted tickets within the scope of the campaign. The sale of discounted tickets between 10.10.2018-13.10.2018 (four days) can be given as an example. The flight date refers to the date range that can be flown after purchasing a ticket. It can be given as an example to determine any day of flight between 01.01.2019-01.03.2019 with a discounted ticket purchased between 10.10.2018-13.10.2018. Within the scope of the thesis, the study on the

impact of discounted ticket ads on airlines stock price will be carried out on the sales dates.

Within the scope of the thesis study, there are thirty three campaign information that can be accessed on the Pegasus Airlines website between 01.10.2018-30.11.2019. (Pegasus Airlines Kampanyalar, 2019) The subject of nine campaigns consists of customer loyalty points gained from Pegasus Airlines, customer loyalty points gained from cooperated companies and special non-flight discounts. Since the content of nine related campaigns is irrelevant of the ticket discount that constitutes the thesis topic, they are excluded from the sample. As a result of the exclusions, the total number of campaigns to be examined within the scope of the thesis has been determined as twenty four. The total number of days open for sale of twenty four campaigns are ninety.

Since the BIST is closed on weekends and public holidays in Turkey, the relevant dates are excluded from the scope of the study and no sample data is included. A total of forty one campaign days excluded from the sample in this context.

As a result of the exclusions detailed above, a total of forty nine campaign days were included in the sample.

4.4 KAP DUMMY VARIABLE

Since the Efficient Market hypothesis in financial economics implies that stock prices reflect all known information about the firm's future earnings prospects (Fama, 1970), market prices should only react to information which is new.

Pegasus Airlines has been listed on the Turkish Stock Exchange or Borsa Istanbul (BIST) since 2013. In the case of events that give rise to insider information and continuous information, capital market instruments are obliged to make disclosures at the Public Disclosure Platform (KAP) using the relevant forms. KAP is an electronic system where notifications to be disclosed to the public in accordance

with the capital market and exchange legislations (BIST, 2019). Regulatory Authority Announcements, Financial Reports, Material Event Disclosures, and Other company related announcements can be seen through this platform. Information given below have been taken from (KAP, 2019);

Regulatory Authority Announcements:

- Announcement of Stock Exchange General Directorate
- Announcement Regarding Code Change
- Announcement Regarding Delisting
- Announcement Regarding Derivatives Market Last Trading Date and Maturity Date
- Announcement Regarding Derivatives Market Transaction Cancellation
- Announcement Regarding Funds
- Announcement Regarding Market Change
- Announcement Regarding Suspension/Re-activation
- Announcement Regarding Warrants
- Appointment of Liquidity Provider
- Appointment of Market Maker
- BIST Announcement Regarding Corporate Actions
- BIST Stock Indices
- BISTECH Equity Market Trading System Announcement
- BIST-KYD Indices
- Borsa Istanbul A.Ş. Announcement
- Capital Market Board Administrative Measures
- Capital Market Board Announcement
- Capital Market Board Decision About Non-Publicly Traded and Banned Shares
- Change in Constituents of BIST Indices
- Changes in Flotation Ratios Used in Calculation of BIST Stock Indices

- CMB Bulletin
- CMBs Assessment Regarding Financial Report Additional Time Demands
- Continuation of Trading Suspend
- Corporate Actions
- Corporate Actions - Cash Dividend Payment
- Corporate Actions – Redemption/Coupon Yield/Profit Share Payment
- Date of Rights Coupon Market
- Debt Securities Starting to Trade
- Debt Securities that will be Sold in Qualified Investors Market
- Default Transaction
- ETFs Starting to Trade
- Ex-Date as to Stock Exchange Procedures
- Foreign Investors Transactions
- Index Announcement
- Investor Based Measure Systems
- Investor Compensation Center Announcement
- İstanbul Takas ve Saklama Bankası A.Ş. Announcement
- Lease Certificates Starting to Trade
- Lease Certificates taht will be Sold in Qualified Investors Market
- List of ABCD Group Stocks
- Merkezi Kayıt Kuruluşu A.Ş. Announcement
- MKK Member Code Changes
- MKK Membership
- MKK Membership Status Change
- Pay Mali Hak Kullanım İşlemi – Nakit Ödeme (en)
- Periodical Assessment Criteria Announcement
- Primary Market Announcement
- Public Disclosure Platform Announcement
- Public Offer of Stocks in the exchange

- Reference Price for Rights Coupon
- Regulatory Authority Announcement
- Removal of Capital Market Board Registration due to Transaction Ban Execution
- Securities to Trade on Debt Securities Market
- Sermaye Piyasası Kurulu Başvuru Sonucu (Haziran 2016 öncesi) (en)
- Sermaye Piyasası Kurulu Başvurusu (Haziran 2016 öncesi) (en)
- Situation of Trading
- Stock Exchange Board Decision
- Stocks Starting to Trade
- Stocks Whose Maximum Lot Quantity Changed
- Structured Debt Securities Starting to Trade
- Takasbank Money Market Daily Bulletin
- Takasbank Securities Lending Market Daily Bulletin
- Test Notification
- Trading Suspension Announcement – Circuit Breaker
- Transaction Cancellation
- Transformation of Shares to Trading Shares
- Warrants or Certificates Starting to Trade
- Warning of Company
- Wholesale Transactions

Financial Reports:

- Financial Report
- Integrated Report
- Operating Review Report
- Statement of Responsibility

Material Event Disclosures:

- Acquisition
- Additional Payments to Employees other than Monthly Salary
- Adverse Opinion or Disclaimer of Opinion in Independent Audit Report
- Amendment of Financial Statement and – or Notes to Financial Statements
- Application for Market Change
- Bankruptcy/Suspension of Bankruptcy
- Board of Director's Subcommittees
- Cancel Corporate Action
- Capital Increase/Decrease
- Capital Market Instruments other than Shares' Transaction Notification
- Change in Article of Association
- Change in City that Activities or Income Concentrated on
- Change in Head Office Address
- Change in Main Subject of Activity
- Change in Market Advisor of Company
- Change of Company Title
- Corporate Governance Compliance Rating
- Credit Rating
- Demerger
- Determination of Independent Audit Company
- Disclosure Policy
- Disposal of Buy-Back Shares
- Dividend Payment
- Dividend Policy
- Enforcement Proceedings
- Forward Looking Evaluations
- General Meeting
- Lawsuit Against Company or Developments in the Lawsuit Against Company

- Loss or Damage of Assets
- Material Event Disclosure (General)
- Merger
- New Business Relation
- Non-current Asset Purchase
- Non-current Asset Sale
- Non-current Financial Asset Acquisition
- Non-current Financial Asset Sale
- Notification About News or Rumors
- Notification Regarding Advance Dividend Payment
- Notification Regarding Authorized Capital
- Notification Regarding Capital Market Instruments Based on Shares
- Notification Regarding Conversion
- Notification Regarding Delisting
- Notification Regarding Investors Bought more than 5% of Securities in IPO
- Notification Regarding Issue Limit
- Notification Regarding Issue of Capital Market Instrument
- Notification Regarding Other Cash Payment
- Notification Regarding Other Share Issue / Cancellation
- Notification Regarding Retirement Right
- Notification Regarding Share Buy-Back
- Notification Regarding Share Purchases via Takeover Bid
- Notification Regarding Shares Kept Ready for Sales
- Notification Regarding Squeeze Out and Sale Out Rights
- Notification Regarding Technical Management
- Notification Regarding Brokerage Houses Warrants – Certificates – Notes
- Partial or Complete Suspension or Impossibility of Operations
- Pre-Sale Notification for Capital Market Instruments
- Procedures Conducted Under Article 376 of Turkish Commercial Code

- Related Party Transactions
- Renting Non-current Asset of Company or Establishment of Real Claim on Non-current Assets of Company
- Results or Ending of Transfer Meetings
- Shares Transaction Notification
- Signing Agreement
- Tender Process/Result
- Termination of an Agreement
- Transfer Meetings
- Unusual Price and Volume Movements
- Wholesale Transactions Notifications

Other:

- Analyst Report about the Price Determination Report (Prepared by an Institution other than the Institution Acting as Intermediary in Public Offering)
- Analyst Report about the Price Determination Report (Prepared by an Intermediary Institution of Public Offering)
- Announcement Regarding Use of Purchase Right
- Articles of Association
- Benefits Obtained from Portfolio Transactions
- Changes in or Additions to Prospectus or Documents Constituting Prospectus
- Circular for Public Offer Program
- Commissions and Fees Paid for Outsourced Services and Personnel
- Commissions Paid for Financial Intermediary Services
- Company General Info Form
- Corporate Governance Compliance Report
- Determination or Modification of Benchmark Criteria

- Evaluation Report About the Assumptions Used in Public Offering Price Determination
- Financial Calendar
- General Explanation
- Information from for Trading in Borsa İstanbul A.Ş.
- Internal Policies
- Investor Report
- Issue Document
- Liquidity Providing Trades
- Market Maker Transaction
- Memorandum of Information
- Monthly Notice
- Notification for Trading at Borsa İstanbul A.Ş.
- Notification Regarding Authorization and Permission Certificates
- Occasional Suspension of Operations
- Performance Report
- Price Determination Report
- Prospectus (Approved by CMB)
- Prospectus for Public Offer Program
- Prospectus (Submitted to CMB Approval)
- Quarterly Notification
- Report about the Use of the Fund Obtained or will be Obtained from Capital Increase
- Sale Notification for Investors
- Shareholder Benefit Program Process or Result
- Submission of Financial Statements to any Authorities
- Sustainability Report
- Tender Offer Information Form
- Tenor Issue Document

- Valuation Report
- Weekly Report

Since important information related to company is disclosed through KAP, I used dummy variable for sample days to see any important impact on stock price. KAP announcements do not consist entirely of numerical data such as financial report. All announcements made by Pegasus Airlines during the research period are included in the dummy variable without exception.

There are total of eighty six announcements on the KAP website, which are included in the scope of the thesis, between 01.10.2018-30.11.2019.

Since the BIST is closed on weekends and public holidays for Turkey, the relevant dates are excluded from the scope of the study and no sample data is included. None of the KAP announcement dates are excluded from the scope of the sample, since the KAP announcements in the scope of research do not overlap with the weekends and public holidays in Turkey.

As a result, a total of eighty six KAP announcement days were included in the scope of the study.

PART 5: RESULTS

CAPM model was employed to determine whether Pegasus Airlines' discounted ticket campaigns had an impact on Pegasus Airlines' return on stock, and examinations were carried out with this aim. Discounted ticket campaigns were added in the model as dummy variable for research period. In order to interpret the model results correctly, the information that the company had to disclose to the public (the days of disclosure in the KAP) was added to the model as dummy variable. Given the fact that the airlines companies being sensitive to the changes on oil and exchange rate; USD/TL, EUR/TL and Brent oil were also included in the model. The aim of this study is to examine the impacts of discounted ticket price on airlines company stock price so the employed CAPM model is examined under two different sections which are 'model result when KAP and campaign dummy used together' and 'model result when campaign dummy used only'. Model results and analysis done are given below in sequence. After briefly summarizing the examinations made in two different models, the model results are presented in detail.

In the first model, the CAPM was created by using KAP and campaign dummies together. In addition, the days on which the KAP and Campaign announcements overlapped in the model were excluded.

In the second model, work was carried out only on the campaign announcements. The data of the days with KAP announcements were excluded from the model. Since the KAP announcements were excluded, value of 1 was assigned to the campaign announcements on the days when the KAP and campaign announcements overlapped.

For the reliability of the model results, the correlation between the variables was examined. The main purpose of examining the correlation status between the variables was to determine whether a multicollinearity situation occurred due to the high correlation.

The linear relationship between two variables can be tested by the correlation analysis which is a statistical method used frequently in finance. Furthermore, the degree of the relationship can be measured by correlation analysis, if any. Correlation analysis aims to see how the dependent variable will change when the independent variable changes. The correlation coefficient indicates whether there is a linear relationship if so the degree of relationship as a result of the analysis. The correlation coefficient takes values between -1 and +1 and generally shown as “r”. The explanations are given below related to correlation coefficient:

- If the values of the X variable are increasing while the values of the Y variable increasing or vice versa, there is a positive correlation between them.
- If the values of the X variable are increasing while the values of the Y variable decreasing or vice versa, there is a negative correlation between them.
- The correlation coefficient of "0" indicates that there is no linear relationship between the variables.

Multicollinearity takes place when there is a very high relationship between at least two variables that estimate a variable. Since two variables with very high correlation between them will be partly very similar, it will be appropriate to remove one of the two from the model.

As a result of the examination performed on the correlation table of variables (Table 5.1**)**, it is observed that there is a correlation between USD/TL return and EUR/TL return. In addition, there is a correlation between the dependent variable, Pegasus Airlines stock excess return and BIST-100 index excess return. It is observed that the correlation relationship between other independent variables are not significant.

Table 5.1: Correlation Between Model Variables

Correlation Coefficients	PGSUS Excess Return	BIST-100 Excess Return	Brent Oil Return	USD/TL Return	EUR/TL Return	Campaign Dummy	KAP Dummy
PGSUS Excess Return	1,0000						
BIST-100 Excess Return	0,4347*	1,0000					
Brent Oil Return	-0,0516	0,0600	1,0000				
USD/TL Return	0,0337	-0,0066	0,0825	1,0000			
EUR/TL Return	0,0278	-0,0163	0,0670	0,9350**	1,0000		
Campaign Dummy	0,0070	-0,0820	0,0172	-0,0309	-0,0448	1,0000	
KAP Dummy	0,0542	-0,0038	0,0411	0,0719	0,0571	-0,1647	1,0000

Note: * indicates 'moderate' correlation, ** indicates 'very strong' correlation according to Evans (1996)

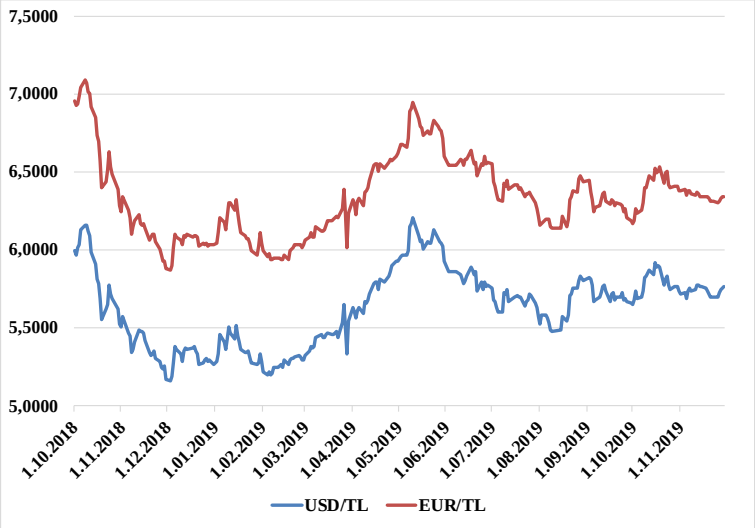
The strength of the correlation using the guide that Evans (1996) suggests for the absolute value:

- 0,00 - 0,19 : "very weak"
- 0,20 - 0,39 : "weak"
- 0,40 - 0,59 : "moderate"
- 0,60 - 0,79 : "strong"
- 0,80 - 1,00 : "very strong"

In the guide of the suggested scale, we can say that the correlation coefficient between USD/TL return and EUR/TL return, which is 0,9350, indicates that there is a very strong correlation between these independent variables. The correlation coefficient between Pegasus Airlines stock excess return and BIST-100 index

excess return, which is 0,4347, indicates that there is a moderate correlation between these variables. The correlation coefficients of all the remaining variables are in the range between 0,0038 and 0,1647 which indicate very weak correlation.

Figure 5.1: USD/TL and EUR/TL Exchange Rates for Research Period



(TCMB, 2019)

Due to the very strong correlation between EUR/TL return and USD/TL return as a result of the correlation test, the model was updated to eliminate the risk of multicollinearity. To solve the multicollinearity problem, USD/TL return independent variable was excluded from both models, and both models were re-studied without USD/TL return. The correlation results between variables related to models can be followed as given in summary below:

- In case of KAP and Campaign dummies used together, there is a very strong correlation between USD/TL return and EUR/TL return, moderate correlation between Pegasus Airlines stock excess return and BIST-100 index excess return.

- In case of KAP and Campaign dummies used together with USD/TL return variable excluded, there is a moderate correlation between Pegasus Airlines stock excess return and BIST-100 index excess return.
- In case of Campaign dummy used only, there is a very strong correlation between USD/TL return and EUR/TL return, moderate correlation between Pegasus Airlines stock excess return and BIST-100 index excess return.
- In case of Campaign dummy used only with USD/TL return variable excluded, there is a moderate correlation between Pegasus Airlines stock excess return and BIST-100 index excess return.

5.1. MODEL RESULT WHEN KAP AND CAMPAIGN DUMMY USED TOGETHER

In the first model, the relationship between Pegasus Airlines stock excess return, BIST-100 index excess return, Brent oil return, USD/TL return, EUR/TL return, KAP and Campaign announcements are examined.

According to Table 5.2, it can be inferred that R-squared value (0,2032) is very low indicating that the independent variables are not able to explain the dependent variable effectively.

As a result of the examinations, beta coefficient (BIST-100 index excess return) which is 0,9856 shows that the volatility of the Pegasus Airlines stock is very close to the BIST-100 index but a little less volatile than the BIST-100 index. A stock beta which is between 0 and 1 implies that the stock moves in the same direction as the market, with less volatility.

Abnormal return coefficient (Alpha = 0,0023) is positive, meaning Pegasus Airlines stock performed better than the market, but it is determined that the coefficient is not statistically significant in measuring how much Pegasus Airlines outperform or underperform the market.

Although BIST-100 index excess return coefficient is significant, it has been determined that USD/TL return, EUR/TL return, KAP and Campaign dummies are determined to be insignificant in explaining Pegasus Airlines Stock excess return.

Table 5.2: CAPM Results for KAP and Campaign Dummies Used Together

Variable	Coefficient	Standard Error	p-value
Constant	0,0023	0,0020	0,2444
BIST 100 Excess Return	0,9856	0,1231	0,0000***
Brent Oil	-0,1268	0,0828	0,1269
USD/TL	0,0996	0,5347	0,8524
EUR/TL	0,0440	0,5579	0,9372
Kampanya Dummy	0,0051	0,0050	0,3100
KAP Dummy	0,0055	0,0047	0,2412
R-squared	0,2032		
Log likelihood	590,5885		

Note: * indicates 10%, ** indicates 5%, *** indicates 1% significance levels

No significant change was observed in the CAPM model which was repeated after the USD/TL return data was removed. In accordance with the previous work, BIST-100 index excess return resulted significantly in explaining Pegasus Stock Excess Return. The remaining independent variables (Brent Petrol, EUR/TL, KAP and Campaign dummies) were observed as insignificant in explaining Pegasus Stock Excess Return.

Table 5.3: CAPM Results for KAP and Campaign Dummies Used Together with USD/TL Return Excluded

Variable	Coefficient	Standard Error	p-value
Constant	0,0023	0,0020	0,2400
BIST 100 Excess Return	0,9862	0,1228	0,0000***
Brent Oil	-0,1260	0,0826	0,1281
EUR/TL	0,1411	0,1979	0,4764
Kampanya Dummy	0,0051	0,0050	0,3051
KAP Dummy	0,0055	0,0047	0,2354
R-squared	0,2031		
Log likelihood	590,5707		

Note: * indicates 10%, ** indicates 5%, *** indicates 1% significance levels

5.2. MODEL RESULT WHEN CAMPAIGN DUMMY USED ONLY

In the second model, the relationship between Pegasus Airlines stock excess return, BIST-100 index excess return, Brent oil return, USD/TL return, EUR/TL return and Campaign dummy are examined.

According to Table 5.4, it can be inferred that R-squared value (0,28) is very low indicating that the independent variables are not able to explain the dependent variable effectively.

As a result of the examinations, the only difference from the previous model results is Brent oil return which is determined to be significant on the Pegasus stock excess return on %5 significance level. Previous model results related to variables including BIST-100 index excess return, USD/TL return, EUR/TL return and Campaign announcements still remain valid.

Table 5.4: CAPM Results for Only Campaign Dummy Used

Variable	Coefficient	Standard Error	p-value
Constant	0,0007	0,0018	0,7087
BIST 100 Excess Return	1,0114	0,1162	0,0000***
Brent Oil	-0,1661	0,0728	0,0236**
USD/TL	0,2970	0,5153	0,5650
EUR/TL	-0,1481	0,5356	0,7825
Kampanya Dummy	-0,0006	0,0040	0,8871
R-squared	0,2800		
Log likelihood	503,0196		

Note: * indicates 10%, ** indicates 5%, *** indicates 1% significance levels

No significant change was observed in the CAPM model which was repeated after the USD/TL return data was removed. In accordance with the previous work, BIST-100 index excess return resulted significant in explaining Pegasus Stock Excess Return. Brent oil return which is determined to be significant on the Pegasus stock excess return on %5 significance level same as previous result. The remaining independent variables (EUR/TL, Campaign dummy) were observed as insignificant in explaining Pegasus Stock Excess Return.

Table 5.5: CAPM Results for Only Campaign Dummy Used with USD/TL Return Excluded

Variable	Coefficient	Standard Error	p-value
Constant	0,0007	0,0018	0,6951
BIST 100 Excess Return	1,0157	0,1157	0,0000***
Brent Oil	-0,1683	0,0726	0,0214**
EUR/TL	0,1407	0,1888	0,4570
Kampanya Dummy	-0,0006	0,0040	0,8899
R-squared	0,2789		
Log likelihood	502,8489		

Note: * indicates 10%, ** indicates 5%, *** indicates 1% significance levels

CONCLUSION

PART 6:

In this paper, I examined the impact of discounted ticket ads on airlines stock price with an empirical analysis for Pegasus Airlines. The study used daily excess stock returns from Pegasus Airlines listed on the BIST-100 index from 01.10.2018 to 30.11.2019. Discounted ticket ads announced by Pegasus Airlines were used for the examination to reveal the relationship in this timeframe. Other independent variables including BIST-100 index daily excess return, Brent oil daily return, USD/TL daily return, EUR/TL daily return, KAP and Campaign announcements were also included and examined in the CAPM model.

Although Pegasus Airlines has been operating charter flights since 1990, it has been operating low-cost network carrier model since 2005. The services offered in low-cost network carrier companies widely vary but they generally offer lower fares with fewer amenities than conventional full-service airlines. The business model of the Pegasus Airlines mostly based on efficiency in operations and control on costs. Additional revenue generation through passenger services can be taken into account.

Fuel costs have an important share in total cost item. The share of the foreign currency income (in terms of USD and EUR) in the total revenue exceeds two thirds of total income as of 2019-year end. Similarly, the share of the foreign currency expense (in terms of USD and EUR) in the total expense exceeds two thirds of total income as of 2019 year-end according to Pegasus Airlines' 2019 year-end report.

As a publicly traded company whose shares are traded on the BIST Stock Exchange, Pegasus Airlines has to announce important disclosures at the KAP. Since company announces information that may affect the investor decisions, it is included in the model also. There are total of eighty six announcements on the KAP

website, which are included in the scope of the thesis, between 01.10.2018-30.11.2019.

For Campaign dummy, all advertisements that can be accessed retrospectively in the campaigns section of the Pegasus Airlines website have been selected as the main mass. Within the scope of the thesis study, there are thirty three campaign information that can be accessed on the Pegasus Airlines website between 01.10.2018-30.11.2019. The subject of nine campaigns consists of customer loyalty points gained from Pegasus Airlines, customer loyalty points gained from cooperated companies and special non-flight discounts. Since the content of nine related campaigns is not included in the ticket discount that constitutes the thesis topic, they are excluded from the sample. As a result of the exclusions, the total number of campaigns to be examined within the scope of the thesis is determined as twenty four. Since the BIST is closed on weekends and public holidays in Turkey, the relevant dates are excluded from the scope of the study and no sample data is included.

For the reliability of the model results, the correlation between the variables are examined. The main purpose of examining the correlation status between the variables is to determine whether a multicollinearity situation occurs due to the high correlation. Whether variables are insignificant due to multicollinearity is attempted to be observed.

As a result of the examination performed on the correlation table of variables (Table 5.1**)**, it is observed that there is a very strong correlation between USD/TL return and EUR/TL return. In addition, there is also a moderate correlation between the dependent variable, Pegasus Airlines stock excess return and BIST-100 index excess return. It is observed that the correlation relationship between other independent variables are not significant. Due to the very strong correlation between EUR/TL return and USD/TL return as a result of the correlation test, the model is updated to eliminate the risk of multicollinearity. To solve the

multicollinearity problem, USD/TL return independent variable is excluded from both models, and both models re-studied without USD/TL return.

In the first model, the CAPM is was created by using KAP and Campaign dummies together. In addition, the days on which the KAP and Campaign announcements overlapped in the model are excluded. The relationship between Pegasus Airlines stock excess return, BIST-100 index excess return, Brent oil return, USD/TL return, EUR/TL return, KAP and Campaign announcements are examined.

BIST-100 index excess return (Beta) which is 0,9856 shows that the volatility of the Pegasus Airlines stock is very close to the BIST-100 index, yet a little less volatile than the BIST-100 index. A stock beta which is between 0 and 1 implies that the stock moves in the same direction as the market, with less volatility.

Abnormal return coefficient (Alpha = 0,0023) is positive, meaning Pegasus Airlines stock performs better than the market in the given time period, yet it is determined that the coefficient is not statistically significant in measuring how much Pegasus Airlines outperform or underperform the market.

Although BIST-100 index excess return coefficient is significant, it has been determined that USD/TL return, EUR/TL return, KAP and Campaign dummies are determined to be insignificant in explaining Pegasus Airlines stock excess return. No significant change is observed in the CAPM model results which is repeated after the USD/TL return data was removed.

In the second model, the relationship between Pegasus Airlines stock excess return, BIST-100 index excess return, Brent oil return, USD/TL return, EUR/TL return and Campaign dummy are examined.

The only difference from the previous model results is Brent oil return which is determined to be significant on the Pegasus Airlines stock excess return on %5 significance level. Previous model results related to variables including BIST-100

index excess return, USD/TL return, EUR/TL return and Campaign announcements still remain valid. No significant change is observed in the CAPM model results which is repeated after the USD/TL return data is removed.

As a result of the examinations, we are able to conclude that there is no impact of discounted ads on airlines stock price regarding Pegasus Airlines empirical analysis.

REFERENCES

Alves, U., & Caetano, M. (2016). Analysis of ticket price in the airline industry from the perspective of operating costs, supply and demand. *Aviation in Focus, 7*(2), 21-28.

BIST. (2019). *Public Disclosure Platform (KAP)*. Retrieved from Borsa Istanbul Web site: https://www.borsaistanbul.com/en/companies/public-disclosure-platform

Bloomberg L.P. (2019). *BIST-100 Index for 01.10.2018 – 01.11.2019 Period*. Retrieved December 2019, from Bloomberg Terminal.

Bloomberg L.P. (2019). *Pegasus Airlines (PGSUS) Daily Stock Price for 01.10.2018 – 01.11.2019 Period*. Retrieved December 2019, from Bloomberg Terminal.

Breitenfellner, A., & Cuaresma, J. C. (2008). Crude Oil Prices and the USD/EUR Exchange Rate. *Monetary Policy & the Economy*(4), 102-121.

Chaney, P. K., Devinney, T. M., & Winer, R. S. (1991). The Impact of New Product Introductions on the Market Value of Firms. *The Journal of Business, 64*(4), 573-610.

Chemmanur, T. J., & Yan, A. (2019). Advertising, Attention, and Stock Returns. *Quarterly Journal of Finance, 9*(3), 1950009.

DHMİ. (2019). *2018 Havayolu Sektör Raporu.* Ankara: Devlet Hava Meydanları İşletmesi Genel Müdürlüğü.

Eyüboğlu, K. (2014). *Halka Açık Bilgilerin Hisse Senedi Performansına Etkisi: BİST-30 Şirketleri Örneği.* Trabzon: Karadeniz Teknik Üniversitesi.

Fabozzi, F., Gupta, F., & Markowitz, H. (2002). The legacy of modern portfolio theory. *Journal of Investing*, 7-22.

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance, 25*(2), 383-417.

Grullon, G., Kanatas, G., & Weston, J. P. (2004, April). Advertising, Breadth of Ownership, and Liquidity. *The Review of Financial Studies, 17*(2), 439-461.

IATA. (2011). *IATA Vision 2050.* Retrieved December 2019, from International Air Transport Association: https://www.iata.org/contentassets/bccae1c5a24e43759607a5fd8f44770b/vision-2050.pdf

Investing. (2019). *Brent Oil/USD Price for 01.10.2018 – 01.11.2019 Period*. Retrieved December 2019, from Investing Commodities Brent Oil: https://www.investing.com/commodities/brent-oil

Investopedia. (2020). *Efficient Frontier*. Retrieved May 2020, from Investopedia: https://www.investopedia.com/terms/e/efficientfrontier.asp

Joshi, A., & Hanssens, D. M. (2010, January). The Direct and Indirect Effects of Advertising Spending on Firm Value. *Journal of Marketing, 74*(1), 20-33.

KAP. (2019). *Company Notifications*. Retrieved December 2019, from Public Disclosure Platform: https://www.kap.org.tr/en/bildirim-sorgu

Kim, J., & Morris, J. D. (2003). The effect of advertising on the market value of firms: Empirical evidence from the Super Bowl ads. *Journal of Targeting, Measurement and Analysis for Marketing*, 53-65.

Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance, 7*, 77-91.

Öncü, M. A., Çömlekçi, İ., & Coşkun, E. (2010). Havayolu Şirketlerinin Uyguladıkları Finansal Stratejiler Üzerine Bir Araştırma. *Ekonomik ve Sosyal Araştırmalar Dergisi, 6*(2), 27-58.

Pegasus Airlines. (2020). *Pegasus Airlines 2019 Q4 Results Presentation.* Istanbul: Pegasus Airlines.

Pegasus Airlines Kampanyalar. (2019). *01.10.2018-30.11.2019 Tarihleri Arasındaki Kampanyalar*. 2019 December tarihinde Pegasus Airlines Kampanyalar: https://www.flypgs.com/kampanyali-ucak-biletleri/gecmis-kampanyalar adresinden alındı

Sharpe, W. F. (1964, September). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance, 19*, 425-442.

Slotegraaf, R. J., & Pauwels, K. (2008, June). The Impact of Brand Equity and Innovation on the Long-Term Effectiveness of Promotions. *Journal of Marketing Research*, 293-306.

TCMB. (2019). *01.10.2018-01.11.2019 Tarihleri Arasındaki Dolar Kuru*. Aralık 2019 tarihinde Türkiye Cumhuriyeti Merkez Bankası Elektronik Veri Dağıtım Sistemi: https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket/#collapse_2 adresinden alındı

TCMB. (2019). *01.10.2018-01.11.2019 Tarihleri Arasındaki Euro Kuru*. Aralık 2019 tarihinde Türkiye Cumhuriyeti Merkez Bankası Elektronik Veri Dağıtım Sistemi: https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket/#collapse_2 adresinden alındı

TCMB. (2019). *01.10.2018-01.11.2019 Tarihleri Arasındaki USD/TL ve EUR/TL Kuru*. Retrieved Aralık 2019, from Türkiye Cumhuriyeti Merkez Bankası Elektronik Veri Dağıtım Sistemi: https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket/#collapse_2

Trading Economics. (2020, May 1). *Turkey GDP Annual Growth Rate*. Retrieved from Trading Economics: https://tradingeconomics.com/turkey/gdp-growth-annual

Türk Hava Yolları. (2020). *2019 Faaliyet Raporu.* İstanbul: Türk Hava Yolları.

Uslu, S., & Cavcar, A. (2003). Havayolu İşletmelerinde Bir Maliyet Unsuru: Avrupa Hava Sahası'nda Hava Trafik Yol Ücretleri. *Sosyal Bilimler Dergisi 2002-2003*, 81-94.

Vasigh, B., Fleming, K., & Tacker, T. (2008). *Introduction to Air Transport Economcis From Theory to Applications.* Burlington: Ashgate.

World Bank. (2020, April 1). *The World Bank in Turkey Country Snapshot.* Retrieved from The World Bank Group:

http://pubdocs.worldbank.org/en/181801587125378913/Turkey-Snapshot-Apr2020.pdf

Yahoo Finance. (2020). *Pegasus Hava Tasimaciligi Anonim Sirketi (PGSUS.IS)*. Retrieved May 2020, from Yahoo Finance: https://finance.yahoo.com/quote/PGSUS.IS?p=PGSUS.IS&.tsrc=fin-srch

APPENDIX

APPENDIX 1: ADF TEST RESULTS FOR BRENT OIL, USD/TL AND EUR/TL RAW DATA

Series: EUR_TL_TCMB_BID_OFFER_AVERAGE_ Workfile: EUR TL RAW DATA::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats | Ident

Augmented Dickey-Fuller Unit Root Test on EUR_T

Null Hypothesis: EUR_TL_TCMB_BID_OFFER_AVERAGE_ has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.587110	0.0968
Test critical values:	1% level	-3.452674	
	5% level	-2.871263	
	10% level	-2.572023	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EUR_TL_TCMB_BID_OFFER_AVERAGE_)
Method: Least Squares
Date: 04/12/20 Time: 16:51
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 291 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR_TL_TCMB_BID_OFFER_AVERAGE_...	-0.030435	0.011764	-2.587110	0.0102
C	0.190629	0.074559	2.556760	0.0111

R-squared	0.022635	Mean dependent var	-0.002101
Adjusted R-squared	0.019254	S.D. dependent var	0.052575
S.E. of regression	0.052066	Akaike info criterion	-3.065749
Sum squared resid	0.783449	Schwarz criterion	-3.040503
Log likelihood	448.0665	Hannan-Quinn criter.	-3.055636
F-statistic	6.693139	Durbin-Watson stat	1.745779
Prob(F-statistic)	0.010167		

Series: USD_TL__TCMB_BID_OFFER_AVERAGE_ Workfile: USD TL RAW DATA::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats | Ident

Augmented Dickey-Fuller Unit Root Test on USD_TL_

Null Hypothesis: USD_TL__TCMB_BID_OFFER_AVERAGE_ has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.978487	0.2963
Test critical values:	1% level	-3.452674	
	5% level	-2.871263	
	10% level	-2.572023	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(USD_TL__TCMB_BID_OFFER_AVERAGE_)
Method: Least Squares
Date: 04/12/20 Time: 16:43
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 291 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USD_TL__TCMB_BID_OFFER_AVERAGE...	-0.022876	0.011563	-1.978487	0.0488
C	0.127960	0.065142	1.964320	0.0505

R-squared	0.013364	Mean dependent var	-0.000799
Adjusted R-squared	0.009950	S.D. dependent var	0.048930
S.E. of regression	0.048686	Akaike info criterion	-3.200015
Sum squared resid	0.685015	Schwarz criterion	-3.174769
Log likelihood	467.6022	Hannan-Quinn criter.	-3.189902
F-statistic	3.914411	Durbin-Watson stat	1.814258
Prob(F-statistic)	0.048823		

Series: BRENT_PETROL__USD_ Workfile: BRENT RAW DATA::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats | Ide

Augmented Dickey-Fuller U

Null Hypothesis: BRENT_PETROL__USD_ has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.946858	0.0414
Test critical values:	1% level	-3.452991	
	5% level	-2.871402	
	10% level	-2.572097	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BRENT_PETROL__USD_)
Method: Least Squares
Date: 04/12/20 Time: 16:47
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 287 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BRENT_PETROL__USD_(-1)	-0.036825	0.012496	-2.946858	0.0035
C	2.297590	0.817387	2.810894	0.0053

R-squared	0.029569	Mean dependent var	-0.099721
Adjusted R-squared	0.026164	S.D. dependent var	1.364440
S.E. of regression	1.346473	Akaike info criterion	3.439798
Sum squared resid	516.7016	Schwarz criterion	3.465299
Log likelihood	-491.6110	Hannan-Quinn criter.	3.450018
F-statistic	8.683974	Durbin-Watson stat	2.150213
Prob(F-statistic)	0.003476		

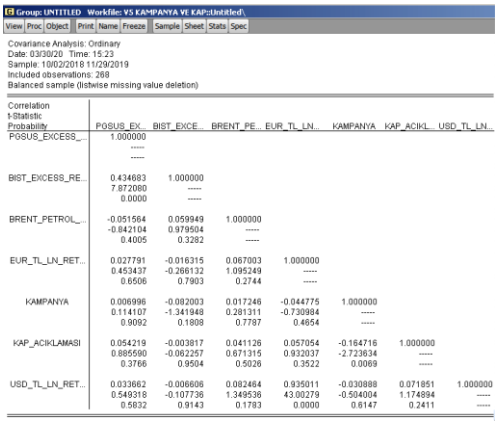
APPENDIX 2: LIST OF CAMPAIGNS USED IN SCOPE OF THE STUDY

No	Campaign Name	Ticket Sale Date	Flight Date
1	Eylül Fırsat Haftası	23 – 24 Eylül 2019	15 Kasım 2019 – 15 Mart 2020
2	11 Kasım'a Özel Yurt Dışı Uçuşlarım 11 Euro!	11-12 Kasım	15 Ocak – 15 Mart 2020
3	Kıbrıs'a Salı ve Çarşamba Uç, %50 İndirimli Uç!	1 - 3 Kasım 2019	12 Kasım – 25 Aralık 2019
4	2020 Yaz Sezonu Fiyatlarımı Kaçırma!	23 - 29 Ekim 2019	29 Mart – 24 Ekim 2020
5	2020 Yaz Sezonu Biletleri Satışta!	16 - 22 Ekim 2019	29 Mart – 24 Ekim 2020
6	Yurt İçi Sabit Fiyat Kampanyası	18 Eylül / 20 Eylül 2019	01 Kasım / 20 Aralık 2019
7	ŞAKAM YOK! KIBRIS UÇUŞLARI 1TL+VERGİLERLE SATIŞTA!	12 Eylül / 15 Eylül 2019	01 Kasım / 26 Aralık 2019
8	Yurt Dışı %50'ye Varan İndirimle Keşfedilir!	29 Ağustos / 01 Eylül 2019	15 Ocak / 15 Mart 2020
9	Şakam Yok! Avrupa biletlerim 1€+vergiler ile satışta!	22 Ağustos / 25 Ağustos 2019	20 Kasım / 15 Aralık 2019
10	Tüm Yurt İçinde 780.000 Koltuk Sabit Fiyatlarla Satışta! Son gün 14 Ağustos!	10 Ağustos / 14 Ağustos 2019	10 Şubat / 28 Mart 2020
11	1 Bilet Alana 1 Bilet Bedava	01 Ağustos / 04 Ağustos 2019	20 Ağustos / 30 Eylül 2019
12	Fırsat Haftasında Sürpriz Hatlar %30 İndirimli	21 Temmuz / 28 Temmuz 2019	16 Eylül / 25 Ekim 2019
13	Yurt Dışı Uçuşlara Sepette 100 TL İndirim	21 Haziran / 23 Haziran 2019	16 Eylül 2019 / 28 Mart 2020
14	2019-2020 Sonbahar-Kış Biletlerimi Kaçırma!	05 Haziran / 12 Haziran 2019	27 Ekim 2019 / 28 Mart 2020
15	YURT DIŞINA %30 İNDİRİMLE UÇ!	01 Haziran / 02 Haziran 2019	10 Eylül / 24 Ekim 2019
16	YURT DIŞINA %20 İNDİRİMLE UÇ!	25 Mayıs / 26 Mayıs 2019	31 Ekim 2019 / 28 Mart 2020
17	%40 İndirimle Kıbrıs Seni Bekliyor!	20 Mayıs / 22 Mayıs 2019	10 Eylül / 24 Ekim 2019
18	%30 İndirimle Yaz Tatilini Şimdiden Uzat	13 Mayıs / 14 Mayıs 2019	17 Eylül / 24 Ekim 2019
19	Yurt İçinde %30 İndirimi Kaçırma	28 Nisan / 28 Nisan 2019	17 Eylül / 24 Ekim 2019
20	Yurt Dışı Uçuşları Sabah 9'a Kadar %40 İndirimli!	26 Nisan / 27 Nisan 2019	17 Eylül / 25 Ekim 2019
21	Yurt İçi ve Yurt Dışı %40 İndirimli	20 Nisan / 22 Nisan 2019	17 Eylül / 24 Ekim 2019
22	Sonbahar-Kış Sezonu Mobil Uygulamamda Açıldı!	23 Mart / 27 Mart 2019	27 Ekim 2019 / 28 Mart 2020
23	Türkiye'yi Keşfetme Zamanı!	23 Ekim / 31 Ekim 2018	31 Mart / 26 Ekim 2019
24	2019 İlkbahar Yaz Biletleri Satışta!	17 Ekim / 26 Ekim 2018	31 Mart / 26 Ekim 2019

APPENDIX 3: LIST OF KAP ANNOUNCEMENTS USED IN SCOPE OF THE STUDY

No	Announcement Date	Announcement Subject	Announcement Summary
1	18.11.2019	Özel Durum Açıklaması (Genel)	Ekim ayı Trafik Verileri
2	11.11.2019	Kurumsal Yönetim Bilgi Formu (Güncelleme) - Yönetim Kurulu-2	Kurumsal Yönetim Bilgi Formu (Güncelleme)
3	11.11.2019	Kurumsal Yönetim Bilgi Formu (Güncelleme) - Yönetim Kurulu-1	Kurumsal Yönetim Bilgi Formu (Güncelleme)
4	11.11.2019	Kurumsal Yönetim Uyum Raporu (Güncelleme)	Kurumsal Yönetim Uyum Raporu (Güncelleme)
5	11.11.2019	Şirket Genel Bilgi Formu	
6	11.11.2019	2019 3. Çeyrek Sonuçları Sunumu	2019 3. Çeyrek Sonuçları Sunumu
7	11.11.2019	Finansal Rapor	
8	11.11.2019	Faaliyet Raporu (Konsolide)	ARA DÖNEM FAALİYET RAPORU
9	11.11.2019	Sorumluluk Beyanı (Konsolide)	SORUMLULUK BEYANI
10	25.10.2019	BIST Sürdürülebilirlik Endeksi Dönemsel Değişiklikleri	
11	15.10.2019	Bağlı Ortaklık Payı Satışı	
12	09.10.2019	Özel Durum Açıklaması (Genel)	Eylül 2019 Trafik Verileri
13	07.10.2019	Şirket Genel Bilgi Formu	
14	07.10.2019	Özel Durum Açıklaması (Genel)	Bağımsız Yönetim Kurulu Üyesi Atanması
15	13.09.2019	Finansal Duran Varlık Satışı	Bağlı Ortaklık Pay Satışı
16	10.09.2019	Özel Durum Açıklaması (Genel)	Ağustos 2019 Trafik Verileri
17	04.09.2019	İşlem Sırası Durdurma Bildirimi	PGSUS.E İşlem Sırasında Devre Kesici Uygulaması Başlamıştır
18	29.08.2019	Şirket Genel Bilgi Formu	
19	29.08.2019	Özel Durum Açıklaması (Genel)	Yönetim Kurulu Üyesi Değişikliği
20	20.08.2019	Özel Durum Açıklaması (Genel)	Temmuz 2019 Trafik Verileri
21	19.08.2019	Kurumsal Yönetim İlkelerine Uyum Derecelendirmesi	Kurumsal Yönetim İlkelerine Uyum Derecelendirmesi 2019
22	09.08.2019	Faaliyet Raporu (Konsolide)	Ara Dönem Faaliyet Raporu-Güncelleme
23	09.08.2019	İşlem Sırası Durdurma Bildirimi	PGSUS.E İşlem Sırasında Devre Kesici Uygulaması Başlamıştır
24	08.08.2019	Özel Durum Açıklaması (Genel)	2019 2. Çeyrek Sonuçları Sunumu
25	08.08.2019	Finansal Rapor	
26	08.08.2019	Faaliyet Raporu (Konsolide)	Ara Dönem Faaliyet Raporu
27	08.08.2019	Sorumluluk Beyanı (Konsolide)	Sorumluluk Beyanı
28	23.07.2019	Şirket Genel Bilgi Formu	
29	23.07.2019	Özel Durum Açıklaması (Genel)	Airbus 320 CEO Filosu Motor Bakım Hizmet Alımı
30	23.07.2019	Özel Durum Açıklaması (Genel)	Yatırımcı İlişkileri Bölümü Yöneticisi Ataması Hakkında Güncelleme
31	19.07.2019	İşlem Sırası Durdurma Bildirimi	PGSUS.E İşlem Sırasında Devre Kesici Uygulaması Başlamıştır
32	08.07.2019	Özel Durum Açıklaması (Genel)	Haziran 2019 Trafik Verileri
33	05.07.2019	Özel Durum Açıklaması (Genel)	Yatırımcı İlişkileri Bölümü Yöneticisi Ataması Hakkında Güncelleme
34	27.06.2019	Geleceğe Dönük Değerlendirmeler	2019 Yılı Operasyonel ve Finansal Beklentiler
35	21.06.2019	Özel Durum Açıklaması (Genel)	Mayıs 2019 Trafik Verileri
36	14.06.2019	Genel Kurul İşlemlerine İlişkin Bildirim	17.04.2019 tarihli Olağan Genel Kurul Toplantısı Sonuçlarının Tescili
37	10.06.2019	Kurumsal Yönetim İlkelerine Uyum Derecelendirmesi	Kurumsal Yönetim Derecelendirme Sözleşmesinin Yenilenmesi
38	07.06.2019	Özel Durum Açıklaması (Genel)	Kurumsal Yönetim Derecelendirme Sözleşmesinin Yenilenmesi
39	07.06.2019	Özel Durum Açıklaması (Genel)	Yatırımcı İlişkileri Bölümü Yöneticisi Ataması Hakkında Güncelleme
40	14.05.2019	Özel Durum Açıklaması (Genel)	Nisan 2019 Trafik Verileri
41	10.05.2019	Sorumluluk Beyanı (Konsolide)	Sorumluluk Beyanı
42	10.05.2019	Faaliyet Raporu (Konsolide)	Ara Dönem Faaliyet Raporu
43	10.05.2019	Özel Durum Açıklaması (Genel)	2019 1. Çeyrek Sunumu
44	10.05.2019	Kurumsal Yönetim Uyum Raporu (Güncelleme)	Kurumsal Yönetim Uyum Raporu (Güncelleme)
45	10.05.2019	Kurumsal Yönetim Bilgi Formu (Güncelleme) - Pay Sahipleri	Kurumsal Yönetim Bilgi Formu (Güncelleme)
46	10.05.2019	Finansal Rapor	
47	06.05.2019	Özel Durum Açıklaması (Genel)	Yatırımcı İlişkileri Bölümü Yöneticisi Görev Değişikliği
48	17.04.2019	Yönetim Kurulu Komiteleri	Yönetim Kurulu Komite ve Görev Dağılımı
49	17.04.2019	Kar Payı Dağıtım İşlemlerine İlişkin Bildirim	2018 dönem kârının kullanımına ilişkin Genel Kurul kararı
50	17.04.2019	Genel Kurul İşlemlerine İlişkin Bildirim	Olağan Genel Kurul Toplantı Tutanağı ve Hazır Bulunanlar Listesi
51	11.04.2019	Özel Durum Açıklaması (Genel)	Mart 2019 karşılaştırmalı trafik verileri
52	20.03.2019	Kar Payı Dağıtım İşlemlerine İlişkin Bildirim	2018 Yılı Dönem Karı/Zararı Hakkında Bildirim
53	20.03.2019	Genel Kurul İşlemlerine İlişkin Bildirim	2018 Yılına İlişkin Olağan Genel Kurul Toplantısı Çağrısı
54	11.03.2019	Özel Durum Açıklaması (Genel)	Şubat 2019 trafik verileri
55	05.03.2019	Kurumsal Yönetim Bilgi Formu	Kurumsal Yönetim Bilgi Formu
56	04.03.2019	Kurumsal Yönetim Uyum Raporu	2018 Kurumsal Yönetim Uyum Raporu
57	04.03.2019	Özel Durum Açıklaması (Genel)	2018 4. Çeyrek Sunumu
58	04.03.2019	Faaliyet Raporu (Konsolide)	2018 Faaliyet Raporu
59	04.03.2019	Finansal Rapor	
60	04.03.2019	Sorumluluk Beyanı (Konsolide)	Sorumluluk Beyanı
61	18.02.2019	Özel Durum Açıklaması (Genel)	Ocak 2019 Karşılaştırmalı Trafik Verileri
62	18.02.2019	Herhangi Bir Otoriteye Mali Tablo Verilmesi	2018 / 4.DÖNEM KURUM GEÇİCİ VERGİ BEYANNAMESİ
63	15.01.2019	Geleceğe Dönük Değerlendirmeler	2019 Yılı Finansal ve Operasyonel Hedef ve Beklentiler
64	11.01.2019	Özel Durum Açıklaması (Genel)	2018 yılı Aralık ayı trafik verileri
65	31.12.2018	Özel Durum Açıklaması (Genel)	Pegasus - İzAir Birleşme İşlemine İlişkin Ayrılma Akçesi Kullanım Hakkı Süresinin Sona Ermesi
66	20.12.2018	Şirket Genel Bilgi Formu	
67	19.12.2018	BİSTECH Pay Piyasası Alım Satım Sistemi Duyurusu	Sermaye Artırımı (Devralma Yoluyla Birleşme)
68	18.12.2018	Özsermaye Hallerine İlişkin Borsa Duyurusu	Birleşme İşlemlerine İlişkin Borsa Duyurusu
69	17.12.2018	Özel Durum Açıklaması (Genel)	Pegasus - İzAir Birleşme İşlemine İlişkin Ayrılma Akçesi Kullanım Hakkı
70	17.12.2018	Birleşme İşlemlerine İlişkin Bildirim	Pegasus - İzAir Birleşme İşleminin Tescili
71	14.12.2018	Merkezi Kayıt Kuruluşu A.Ş. Duyurusu	Hak Kullanım
72	13.12.2018	Birleşme İşlemlerine İlişkin Bildirim	Pegasus – İzAir Birleşme işleminin sonuçlandırılması ve tescil işlemlerine ilişkin Yönetim Kurulu Kararı
73	12.12.2018	Yönetim Kurulu Komiteleri	Yönetim Kurulu Komiteleri Görev ve Çalışma Esaslarında Değişiklik
74	11.12.2018	Özel Durum Açıklaması (Genel)	Kasım 2018 Trafik Verileri
75	11.12.2018	Özel Durum Açıklaması (Genel)	Yönetim Kurulu Komiteleri Görev ve Çalışma Esaslarında Değişiklik
76	28.11.2018	Birleşme İşlemlerine İlişkin Bildirim	Pegasus-İzAir Birleşme İşlemi Kapsamında Gerçekleştirilecek Sermaye Artırımı İçin SPK Onaylı İhraç Belgesi
77	12.11.2018	Özel Durum Açıklaması (Genel)	Birleşme İşlemi İnceleme Hakkı Duyurusu
78	09.11.2018	Özel Durum Açıklaması (Genel)	2018 3. Çeyrek Sonuçları Sunumu
79	09.11.2018	Faaliyet Raporu (Konsolide)	Ara Dönem Faaliyet Raporu
80	09.11.2018	Finansal Rapor	
81	09.11.2018	Sorumluluk Beyanı (Konsolide)	Sorumluluk Beyanı
82	09.11.2018	Birleşme İşlemlerine İlişkin Bildirim	Pegasus ve İzAir'in Pegasus bünyesinde kolaylaştırılmış usulde birleşmesi hakkında Sermaye Piyasası Kurulu onaylı Duyuru Metni
83	09.11.2018	Özel Durum Açıklaması (Genel)	Ekim 2018 Karşılaştırmalı Trafik Verileri
84	08.11.2018	Birleşme İşlemlerine İlişkin Bildirim	Pegasus ve İzAir'in Pegasus bünyesinde kolaylaştırılmış usulde birleşmesi hakkında Sermaye Piyasası Kuruluna onayı
85	11.10.2018	Özel Durum Açıklaması (Genel)	Eylül 2018 Trafik Verileri
86	11.10.2018	Şirket Genel Bilgi Formu	

APPENDIX 4: CORRELATION OF CAMPAIGN AND KAP USED TOGETHER



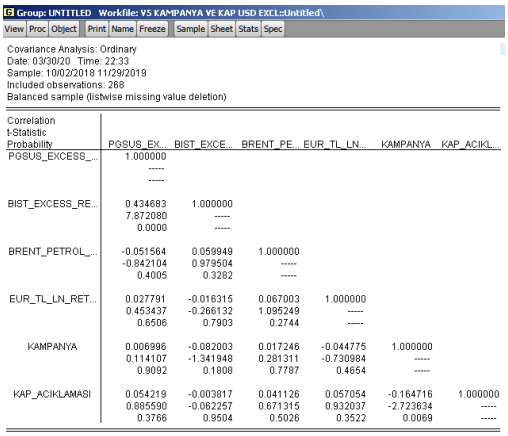
Group: UNTITLED Workfile: VS KAMPANYA VE KAP::Untitled\

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Covariance Analysis: Ordinary
Date: 03/30/20 Time: 15:23
Sample: 10/02/2018 11/29/2019
Included observations: 268
Balanced sample (listwise missing value deletion)

Correlation t-Statistic Probability	PGSUS_EX...	BIST_EXCE...	BRENT_PE...	EUR_TL_LN...	KAMPANYA	KAP_ACIKL...	USD_TL_LN...
PGSUS_EXCESS_...	1.000000 ----- -----						
BIST_EXCESS_RE...	0.434683 7.872080 0.0000	1.000000 ----- -----					
BRENT_PETROL_...	-0.051564 -0.842104 0.4005	0.059949 0.979504 0.3282	1.000000 ----- -----				
EUR_TL_LN_RET...	0.027791 0.453437 0.6506	-0.016315 -0.266132 0.7903	0.067003 1.095249 0.2744	1.000000 ----- -----			
KAMPANYA	0.006996 0.114107 0.9092	-0.082003 -1.341948 0.1808	0.017246 0.281311 0.7787	-0.044775 -0.730984 0.4654	1.000000 ----- -----		
KAP_ACIKLAMASI	0.054219 0.885590 0.3766	-0.003817 -0.062257 0.9504	0.041126 0.671315 0.5026	0.057054 0.932037 0.3522	-0.164716 -2.723634 0.0069	1.000000 ----- -----	
USD_TL_LN_RET...	0.033662 0.549318 0.5832	-0.006606 -0.107736 0.9143	0.082464 1.349536 0.1783	0.935011 43.00279 0.0000	-0.030888 -0.504004 0.6147	0.071851 1.174894 0.2411	1.000000 ----- -----

APPENDIX 5: CORRELATION OF CAMPAIGN AND KAP USED TOGETHER WITH USD/TL RETURN EXCLUDED



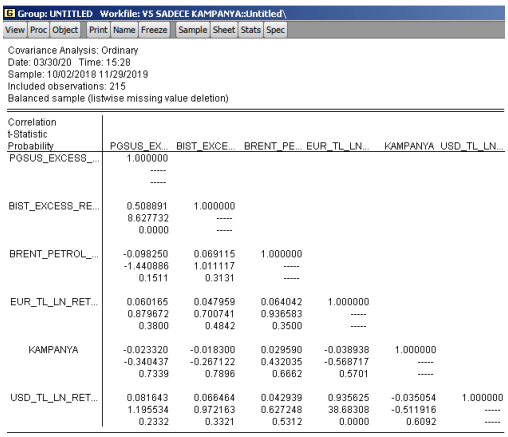
Group: UNTITLED Workfile: VS KAMPANYA VE KAP USD EXCL::Untitled\

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Covariance Analysis: Ordinary
Date: 03/30/20 Time: 22:33
Sample: 10/02/2018 11/29/2019
Included observations: 268
Balanced sample (listwise missing value deletion)

Correlation t-Statistic Probability	PGSUS_EX...	BIST_EXCE...	BRENT_PE...	EUR_TL_LN...	KAMPANYA	KAP_ACIKL...
PGSUS_EXCESS_...	1.000000 ----- -----					
BIST_EXCESS_RE...	0.434683 7.872080 0.0000	1.000000 ----- -----				
BRENT_PETROL_...	-0.051564 -0.842104 0.4005	0.059949 0.979504 0.3282	1.000000 ----- -----			
EUR_TL_LN_RET...	0.027791 0.453437 0.6506	-0.016315 -0.266132 0.7903	0.067003 1.095249 0.2744	1.000000 ----- -----		
KAMPANYA	0.006996 0.114107 0.9092	-0.082003 -1.341948 0.1808	0.017246 0.281311 0.7787	-0.044775 -0.730984 0.4654	1.000000 ----- -----	
KAP_ACIKLAMASI	0.054219 0.885590 0.3766	-0.003817 -0.062257 0.9504	0.041126 0.671315 0.5026	0.057054 0.932037 0.3522	-0.164716 -2.723634 0.0069	1.000000 ----- -----

APPENDIX 6: CORRELATION OF CAMPAIGN USED ONLY



Group: UNTITLED Workfile: VS SADECE KAMPANYA::Untitled\

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Covariance Analysis: Ordinary
Date: 03/30/20 Time: 15:28
Sample: 10/02/2018 11/29/2019
Included observations: 215
Balanced sample (listwise missing value deletion)

Correlation t-Statistic Probability	PGSUS_EX...	BIST_EXCE...	BRENT_PE...	EUR_TL_LN...	KAMPANYA	USD_TL_LN...
PGSUS_EXCESS_...	1.000000 ----- -----					
BIST_EXCESS_RE...	0.508891 8.627732 0.0000	1.000000 ----- -----				
BRENT_PETROL_...	-0.098250 -1.440886 0.1511	0.069115 1.011117 0.3131	1.000000 ----- -----			
EUR_TL_LN_RET...	0.060165 0.879672 0.3800	0.047959 0.700741 0.4842	0.064042 0.936583 0.3500	1.000000 ----- -----		
KAMPANYA	-0.023320 -0.340437 0.7339	-0.018300 -0.267122 0.7896	0.029590 0.432035 0.6662	-0.038938 -0.568717 0.5701	1.000000 ----- -----	
USD_TL_LN_RET...	0.081643 1.195534 0.2332	0.066464 0.972163 0.3321	0.042939 0.627248 0.5312	0.935625 38.68308 0.0000	-0.035054 -0.511916 0.6092	1.000000 ----- -----

APPENDIX 7: CORRELATION OF CAMPAIGN USED ONLY WITH USD/TL RETURN EXCLUDED

Group: UNTITLED Workfile: V5 SADECE KAMPANYA USD EXCL::Untitled\

View | Proc | Object | Print | Name | Freeze | Sample | Sheet | Stats | Spec

Covariance Analysis: Ordinary
Date: 03/30/20 Time: 22:39
Sample: 10/02/2018 11/29/2019
Included observations: 215
Balanced sample (listwise missing value deletion)

Correlation t-Statistic Probability	PGSUS_EX...	BIST_EXCE...	BRENT_PE...	EUR_TL_LN...	KAMPANYA
PGSUS_EXCESS_...	1.000000 ----- -----				
BIST_EXCESS_RE...	0.508891 8.627732 0.0000	1.000000 ----- -----			
BRENT_PETROL_...	-0.098250 -1.440886 0.1511	0.069115 1.011117 0.3131	1.000000 ----- -----		
EUR_TL_LN_RET...	0.060165 0.879672 0.3800	0.047959 0.700741 0.4842	0.064042 0.936583 0.3500	1.000000 ----- -----	
KAMPANYA	-0.023320 -0.340437 0.7339	-0.018300 -0.267122 0.7896	0.029590 0.432035 0.6662	-0.038938 -0.568717 0.5701	1.000000 ----- -----

APPENDIX 8: CAPM RESULTS FOR KAP AND CAMPAIGN DUMMIES USED TOGETHER

Equation: UNTITLED Workfile: V5 KAMPANYA VE KAP::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: PGSUS_EXCESS_RETURN
Method: Least Squares
Date: 03/30/20 Time: 09:49
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 268 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002296	0.001968	1.166634	0.2444
BIST_EXCESS_RETURN	0.985634	0.123088	8.007568	0.0000
BRENT_PETROL__USD__LN_RETU...	-0.126838	0.082825	-1.531409	0.1269
USD_TL_LN_RETURN	0.099568	0.534712	0.186208	0.8524
EUR_TL_LN_RETURN	0.044019	0.557905	0.078900	0.9372
KAMPANYA	0.005089	0.005003	1.017216	0.3100
KAP_ACIKLAMASI	0.005492	0.004675	1.174728	0.2412

R-squared	0.203190	Mean dependent var	0.003627
Adjusted R-squared	0.184873	S.D. dependent var	0.029981
S.E. of regression	0.027068	Akaike info criterion	-4.355138
Sum squared resid	0.191232	Schwarz criterion	-4.261344
Log likelihood	590.5885	Hannan-Quinn criter.	-4.317466
F-statistic	11.09271	Durbin-Watson stat	1.887952
Prob(F-statistic)	0.000000		

APPENDIX 9: CAPM RESULTS FOR KAP AND CAMPAIGN DUMMIES USED TOGETHER WITH USD/TL RETURN EXCLUDED

Equation: UNTITLED Workfile: V5 KAMPANYA VE KAP USD EXCL::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: PGSUS_EXCESS_RETURN
Method: Least Squares
Date: 03/30/20 Time: 22:30
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 268 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002312	0.001963	1.177624	0.2400
BIST_EXCESS_RETURN	0.986201	0.122823	8.029447	0.0000
BRENT_PETROL__USD__LN_RETU...	-0.126044	0.082562	-1.526659	0.1281
EUR_TL_LN_RETURN	0.141123	0.197914	0.713051	0.4764
KAMPANYA	0.005127	0.004989	1.027537	0.3051
KAP_ACIKLAMASI	0.005541	0.004659	1.189322	0.2354

R-squared	0.203084	Mean dependent var	0.003627
Adjusted R-squared	0.187876	S.D. dependent var	0.029981
S.E. of regression	0.027018	Akaike info criterion	-4.362468
Sum squared resid	0.191258	Schwarz criterion	-4.282073
Log likelihood	590.5707	Hannan-Quinn criter.	-4.330177
F-statistic	13.35352	Durbin-Watson stat	1.890924
Prob(F-statistic)	0.000000		

APPENDIX 10: CAPM RESULTS FOR CAMPAIGN USED ONLY

Equation: UNTITLED Workfile: V5 SADECE KAMPANYA::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: PGSUS_EXCESS_RETURN
Method: Least Squares
Date: 03/30/20 Time: 10:21
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 215 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000677	0.001811	0.374056	0.7087
BIST_EXCESS_RETURN	1.011413	0.116174	8.705989	0.0000
BRENT_PETROL__USD__LN_RETU...	-0.166097	0.072829	-2.280661	0.0236
EUR_TL_LN_RETURN	-0.148087	0.535642	-0.276466	0.7825
USD_TL_LN_RETURN	0.296975	0.515295	0.576320	0.5650
KAMPANYA	-0.000574	0.004038	-0.142172	0.8871

R-squared	0.280006	Mean dependent var	0.000959
Adjusted R-squared	0.262781	S.D. dependent var	0.027544
S.E. of regression	0.023650	Akaike info criterion	-4.623438
Sum squared resid	0.116894	Schwarz criterion	-4.529374
Log likelihood	503.0196	Hannan-Quinn criter.	-4.585432
F-statistic	16.25604	Durbin-Watson stat	1.811980
Prob(F-statistic)	0.000000		

APPENDIX 11: CAPM RESULTS FOR CAMPAIGN USED ONLY WITH USD/TL RETURN EXCLUDED

Equation: UNTITLED Workfile: V5 SADECE KAMPANYA USD EXCL::Untitled\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: PGSUS_EXCESS_RETURN
Method: Least Squares
Date: 03/30/20 Time: 22:37
Sample (adjusted): 10/02/2018 11/29/2019
Included observations: 215 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000709	0.001807	0.392444	0.6951
BIST_EXCESS_RETURN	1.015749	0.115746	8.775676	0.0000
BRENT_PETROL__USD__LN_RETU...	-0.168308	0.072612	-2.317916	0.0214
EUR_TL_LN_RETURN	0.140729	0.188834	0.745252	0.4570
KAMPANYA	-0.000559	0.004032	-0.138543	0.8899

R-squared	0.278862	Mean dependent var	0.000959
Adjusted R-squared	0.265126	S.D. dependent var	0.027544
S.E. of regression	0.023612	Akaike info criterion	-4.631153
Sum squared resid	0.117079	Schwarz criterion	-4.552766
Log likelihood	502.8489	Hannan-Quinn criter.	-4.599481
F-statistic	20.30157	Durbin-Watson stat	1.832880
Prob(F-statistic)	0.000000		