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**PAINTINGS AS AN ALTERNATIVE INVESTMENT:
EVIDENCE FROM TURKEY**

**Master Thesis by
RIZA BALCI**

**Thesis Supervisor
Assoc. Prof. SERDA SELİN ÖZTÜRK**

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Paintings as an Alternative Investment:

Evidence From Turkey

Alternatif Yatırım Aracı olarak Resim Sanatı:

Türkiye üzerine bir Çalışma

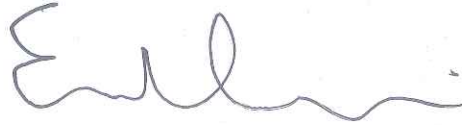
Rıza Balcı

112621031

1) Yrd. Doç. Dr. Serda Selin Öztürk



2) Yrd. Doç. Dr. Ender Demir



3) Umut Keskin



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1) Art

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Abstract

This study which is expanded and most recent study on the paintings market in Turkey for Ottoman and Turkish paintings in Turkey examines the paintings market in Turkey for the time period of 2006 to 2015 (November). We use a unique dataset of 4915 auction sale records for the paintings of 77 Turkish painters Based on this data; we construct the hedonic price indices for the selected painters, in Turkish Liras (TL) and US Dollars (USD). Hedonic regression results indicate that for the period studied paintings of Turkish artists have yielded an annual average return of, is 12.06% and 6.57% for TL and Dollar index, respectively. While the return of Art Price Global (USD) is only 1.46% and the return of Art Price Paintings is index is -1.67% over the same period. There is a significant positive correlation between our art index and the returns of bullion gold, Cumhuriyet gold, 1 ounce gold and 10-year maturity of government bonds. However, the returns of investing in paintings are negatively correlated with the returns of other traditional investment alternatives, such as returns gained from foreign exchange. Hence, art investment may be beneficial not as an alternative but as a means of portfolio diversification.

Keywords: Paintings market, Turkey, Hedonic Regression, Price index, Return, Investment

Özet

Türkiye'deki resim sanatı piyasasının 2006 yılından 2015 yılının kasım ayına kadarki dönemi özelinde inceleyen bu konuyla ilgili şu ana kadar yapılmış en kapsamlı, en güncel çalışmadır. Bu çalışmada 77 Türk sanatçının, 4915 gözlem sayısı müzeyade satış rakamları veri kümesi olarak kullanıldı. Bu veriye dayanarak seçilen ressamıları içeren hedonic fiyat endeksi Türk lirası (TL) ve Amerikan Doları (USD) olarak oluşturuldu. Hedenic regresyon sonuçları gösterdi ki, gözlem yapılan dönemdeki Türk sanatçıların yıllık ortalama getirileri TL olarak 12.06% ve USD olarak 6.57% gözlemlenmiştir. Oysa aynı dönem içerisinde ArtPrice Global (USD) endeksi sadece 1.46% ve ArtPrice resim sanatı endeksi -1.67% getiri göstermiştir. Sanat endeksi ile külçe altın, Cumhuriyet altını, ons altını ve 10 yıllık devlet tahvili arasında pozitif korelasyon gözlemlenmiştir. Bunun yanısıra resim sanatı yatırımı getirisi, döviz getirisi gibi diğer geleneksel finansal enstrumanların getiri karşısında negatif korelasyon göstermiştir. Bu sebeple sanat yatırımı alternatif bir yatırımı aracı olarak değil fakat portfolyo çeşitlendirerek riski azaltma durumunda yararlı olabilir.

Anahtar kelimeler: Sanat, finans, yatırım, resim sanatı, hedonic regresyon, fiyat endeksi

TABLE OF CONTENTS

Abstract.....	i
Özet.....	ii
Table of Contents.....	iii
List of Tables.....	iv
List of Figures.....	v
Acknowledgements.....	vi
1. INTRODUCTION.....	1
2. LITERATURE REVIEW.....	12
3. DATA AND METHODOLOGY.....	19
3.1. Data.....	19
3.2. Methodology.....	22
3.3. Variables.....	23
4. FINDINGS.....	25
5. CONCLUSION.....	32
REFERENCES.....	35

List of Tables

Table 1-1- Value of the International Art Market between 2006 -2015	Error! Bookmark not defined. 2
Table 1-2 - Painters whose work sold for record prices in Turkey in the last two decades and their paintings	Error! Bookmark not defined. 10
Table 2-1 - Relative Returns of Art Reported in Other Studies.....	18
Table 3-1- List of Artists included in this study and their Life Spans (in alphabetical order according to their first names).....	20
Table 4-1 - Top Ten Turkish Artists in Turkish Auctions during the 2006-2015 Period Listed According to Their Total Turnover.....	25
Table 4-2 - Top Ten Turkish Artists in Turkish Auctions During the 2006 - 2015 Period Listed According to Their Average Sale Prices	26
Table 4-3 - Annual Hedonic Regression Results Estimated for the Turkish Auction Sales of 77 Ottoman and Turkish Painters between 2006 and November 2015	27
Table 4-4 - Paintings Market Index of Turkey.....	28
Table 4-5 - Comparison of investment performance	30

List of Figures

Figure 4-1 Hedonic Price Indices of Turkey, ArtPrice Global Index, ArtPrice Paintings Index
.....29

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1. INTRODUCTION

Although some investigations have been realized, there is very little scientific understanding of the causes of demands in the field of art. It can be said that despite the lack of a clear definition of art and the requirement for an “art world” for any work to be endorsed as a work of art, art has been consistently attracting attention as an investment tool and has shown the potential to outshine other, more traditional types of financial assets. Fine art can also be a fine investment. According to the latest The European Fine Art Foundation (TEFAF, 2015) report, the global art market exceeded 51 billion Euros in 2015, with an annual increase of 7%, reaching its highest ever-recorded level. Although the number of transactions rose to 39 million in 2014, the number of transactions is still less than its peak value in 2007 (Table 1-1). This indicates that the vital part of the boost in the market in 2015 was due to higher priced works, rather than simply being due to more works being sold. It also reflects the increasing price of works belonging to particular artists. Three major art markets, namely the United States of America (USA) (39%), China (22%) and the United Kingdom (UK) (22%) dominate the global art market. About 1530 lots exceeding 1 million Euros in sales price value were sold in 2014 (including 96 lots for over 10 million Euros), showing a rise of nearly 17% in number compared to 2013. These lots together represented 48% of the value of the fine art auction market, but only 0.5% of the number of transactions. According to Artprice Global Ranking Top 10 indices, turnover auction totals identify Andy Warhol as the top winner, since he was the world’s highest-paid artist with a market value of USD 569 million. In 2014, Pablo Picasso’s works fetched a total of USD 75 million, followed by Francis Bacon (USD 270 million, with an increase of USD 74 million compared to the previous year), Gerhard Richter (USD 254 million), Mark Rothko (USD 249 million), Claude Monet in (USD 222 million), Chinese artist Qi Baishi (USD 206 million), Alberto Giacometti (USD 205 million), Zhang Daqian (USD 193 million vs. USD 291 million in 2013) and finally, Jeff Koons, (USD 149 million). These numbers are indicative of strong interest on the part of investors in art, with modern and contemporary artworks gathering the highest attention. It also shows the appearance of non-Western artists as strong contenders in the global art market. This is not surprising since wealth creation drives the growth of art markets.

Table 1-1- Value of the International Art Market between 2006 -2015

Years	Total Value (€ billion)	Number of Transactions	Average Value
2006	43.3	32,100,000	1,349
2007	48.1	49,800,000	965
2008	42.2	43,700,000	964
2009	28.3	31,000,000	914
2010	43.0	35,100,000	1,225
2011	46.4	36,800,000	1,260
2012	44.1	35,500,000	1,242
2013	47.4	36,500,000	1,298
2014	51.1	39,000,000	1,307

Source: TEFAF (2015)

Table 1-1 shows that there was a sharp drop in international art trade between periods of 2006-2009 due to the international monetary recession that occurred at the same time. The fall in sales from 2007 to 2009 represents one of the most crucial contractions inside the art marketplace since its preceding recession in the early 1990s. However, sales in 2009 were nevertheless well above any 12 months of the artwork marketplace's history earlier than 2006. Nearly 50% of the value of all transactions within the global market was realized in the European Union (EU) in 2008, which attained a total market turnover of €20.7 billion in 2008.

The UK continues to dominate the EU art trade, with a majority share in 2008 of 69%. The USA and the UK continued to lead the global art market in 2008, gaining approximately more than a third of the fee of all transactions. The USA has retained its leading role in the international art market over the past ten years. However, its margin has declined, as its art market become one of the markets most tormented by the latest worldwide recession. In Euro values, its international marketplace share decreased 11% from 2006 to 2008, dropping to a level of 35%, while the UK made relative gains in similar proportion during the same time, with its share increasing from 27% to 34%. In 2009, the total market share of the USA and the UK declined to a combined value of 59 % (with the share of the UK being 29 % and that of the USA being 30 %).

Average prices in numerous sectors of the art marketplace dropped for the duration of 2008 and 2009. Just as a small number of highly priced sales helped to inflate averages in 2006 and 2007, the decreased number of highly priced works sold over the following years was reflected in a drop in average prices.

Table 1-1 shows that after 2009, there has been a gradual increase both in the number and in the total value of international art market transactions. In the fine art market, different sectors of the market have unique (and frequently independent) boom trajectories in terms of prices, the volume of sales and sales values. Prices in most sectors, however, peaked in 2007 and decreased in 2009. (TEFAF International Art Market Report)

The growth in global art sales can be expected to increase further as new economies emerge in places like Asia, the Middle East, and Latin America. With this in mind, it is imperative for finance experts to become more interested in art markets and to analyze, compare and attempt to predict the performance of different artists and artworks to guide potential investors. However, art markets seem to have little in common with other, more traditional financial markets.

Most art markets are based on high-risk investments; they are opaque and unregulated; show extreme product heterogeneity and high transaction costs; dependent on changing public taste and short-term trends in the art world. Illiquidity, market segmentation, information asymmetries, almost monopolistic price setting and the lack of dividends are other problems. Traditional financial assets, on the contrary, are homogeneous and are characterized by being sold on more numerous, diverse and highly liquid markets (Worthington and Higgs 2005; Mamarbachi et al. 2008, Burton and Jacobsen 1999; Campbell 2004). Furthermore, they can be selected with a relatively small number of objective criteria. They have lower transaction costs and usually do pay out dividends.

These disparities make researching art markets seem like a process as difficult as understanding art itself. However, the need for more reliable criteria to guide investors is clearly present, and this has led to new research approaches and attempts. In recent years, researchers have begun to assess art investment in a variety of ways and slow but promising

progress has begun, often in the form of multidisciplinary approaches that take into consideration the multifaceted interrelations between art and finance.

While most of the former studies on art investment focus on developed countries, interest in researching the situation in developing countries has begun to emerge as art markets continue to grow in many parts of the world, including developing countries. This is a natural result of the worldwide increase in prosperity. Indeed, it is known that once a country becomes wealthier and its nationals achieve a certain level of prosperity, they begin to purchase art both as investment tools and as marks of social status. Turkey is not exempt from this trend. On the contrary, it has shown a remarkably fast development regarding its art market growth and can prove to be an exemplary model to study the evolution of art markets in developing countries.

The Turkish domestic art market is relatively small, but has rapidly grown, especially in the last decade. The near future is possibly going to bring even better rewards for those investing in the Turkish art market and the number of studies focusing on Turkish art market will hopefully increase. This can be gathered from the views of leading experts in Turkish art and finance.

According to an interview that was published in Hurriyet Daily News on 2010, “Turkey is a middle-income developing country with frequent financial and macroeconomic crises and high and sticky inflation rates. Turkey stands as an interesting case for examining art market returns about other investment alternatives. Turkey has a relatively small but rapidly developing art market and has seen paintings retrieve record prices even during the unfavorable times of the [2008] crisis due to staggering demand. The market has an estimated annual volume of \$200 million even though it is a small market in comparison to the world art market which has a volume of around 50 billion USD. With considerable media coverage and public attention to the financial aspects of investing in art objects, the market will grow rapidly. The annual volume of Turkey’s art market stood at only \$7 million during the 1970s, but with free-market reforms in the 1980s, wealthy people were able to become wealthier and buy more art.” (Hurriyet Daily News, 2010)

In a similar manner, Erhan Ersöz, owner of Art Depo said, “The downturn in inflation and interest rates, a stable currency and diversified investment instruments not yielding quickly have all helped art investment rise [in Turkey].” (Hurriyet Daily News, 2010)

According to Doğan Paksoy, a painter and the owner of the Teşvikiye Art Gallery in Istanbul, “The flow of accumulated money from the private capital into art were perceived as a form of prestige and advertisement. It became a necessity for the Turkish bourgeoisie to reach social prestige and recognition when richness was not enough to do that. Paksoy also said that the opening of Istanbul Modern Musuem in 2004 helped the rise of the art market in Turkey. He stated that “With the inauguration, artwork prices were multiplied by four or five times.” (Hurriyet Daily News, 2010)

According to Yahşi Baraz, owner of the Baraz Auction House in Istanbul, art investors abroad purchase art with 10 to 20 percent of their income, but research shows that this figure is around 5 percent in Turkey. Baraz said that “The reason is that art investment is long term and risky” and “95 percent of the paintings currently being sold for huge sums today will not gain in value; only 5 percent will gain. That is because Turkish painting is frail. When the West began the Renaissance, we did not even have fine arts. We were too late. Turkish painting could not be integrated into Western painting.” (Hurriyet Daily News, 2010)

Turkish painters, however, found good value when Christie’s launched an auction in October 2008 in Dubai. The International Modern and Contemporary Art auction witnessed figures ranging from \$17,500 to \$122,500 for works by Turkish artists including Abidin Dino, Erol Akyavaş, Burhan Doğançay and Mübin Orhon. (Hurriyet Daily News, 2010)

Later, a Sotheby’s auction of modern Turkish art in March 2009 netted 1.3 million pounds. A Mübin Orhon painting was purchased for 193,250 pounds, a work by Fahrelnisa Zeid sold for 85,250 pounds while Bedri Baykam’s “The Ultimate Dejeuner” sold for 28,000 pounds. (Hurriyet Daily News, 2010)

Indeed, according to experts, the Turkish art market was not greatly hurt by the 2008 crisis, instead fetching record prices due to a small market with high demand. (Hurriyet Daily News, 2010)

The foundation of and the purchases realized by important Turkish art institutions like Istanbul Modern Museum, Pera Museum, and Santral Istanbul Museum helped to accelerate the prices realized in the Turkish art market to higher levels. (Reuters, 2013)

All of these developments and positive outlooks indicate that researching the financial performance of Ottoman and Turkish artists would be very helpful for potential investors. This is particularly true in light of the very few number of studies realized concerning this subject. Aylin Seckin and Erdal Atukeren must be given place of pride for conducting the first scientific studies on the performance of Ottoman and Turkish artists in auctions. They published a series of studies and were the first to establish the hedonic price index for a group of selected Ottoman and Turkish painters. They researched the auction performance of a select group of 13 painters for the period 1989 to 2006 and observed that making an investment in the market for artwork in Turkey was a viable alternative even in the setting of excessive inflation and massive macroeconomic volatility. The portfolio they researched yielded a small but high-quality real return. Nonetheless, traditional financial investment returns were better than the returns of the art market. As a result, they suggested that art investment may be beneficial as a means of portfolio diversification. They calculated the returns of investments in art in comparison to investing in stocks, foreign exchange, bank deposits and gold over the period of 1989 to 2005. They found that investing in paintings made by Turkish artists was a feasible substitute to investing exclusively in traditional investment tools in an emerging market, i.e., in an environment of high inflation, macroeconomic volatility, and political uncertainty. Later, the same authors investigated the impact of economic crises on art investment and found that the returns on art market investments appeared to boom during the 1994 crisis, but there were drops during the 1998 and 2001 crises. This may have resulted from data-related problems (e.g. lack of enough observations for 1994), or it may have been a base effect due to a slump in the market in the two previous years. In any case, the behavior of the art market was compatible with the behavior of the stock market in 1994. In a further study concerning the Turkish art market, Seckin and Atukeren (2009) expanded their research period to cover the time between 1990 and 2005.

Thus it appears that prices realized in the auctions for Turkish paintings and the prices realized in the international art market co-integrated, both being affected by international recessions. This implies that, despite any short-term fluctuations, price developments in the Turkish and international art markets could move together in the long-run. However, the

unique characteristics of each art market must be researched separately, to avoid reaching generalizations that would not apply to everyone. The Turkish art market, with its impressive growth over a relatively very short time, is particularly worthy of further research.

The Turkish art market has an estimated annual volume of 200 million USD even though it is a small market in comparison to the international art market that has an annual volume of around 50 billion USD. The annual volume of Turkey's art market peaked at only \$7 million during the 1970s. With the transition of its economy from state capitalism to neo-liberalism during the 1980s, wealthy people were able to become wealthier and began to invest in art. As developing markets rapidly see art as a commercial product that can be used to make a profit, the Turkish art market has won amazing returns for investors over the past few years, reaching one of its pinnacles with the sale of Burhan Dogancay's "Blue Symphony" for 2.7 million Turkish Liras. It is also worth noting that Osman Hamdi Bey's painting entitled "The Tortoise Trainer" broke the world record for Turkish and Ottoman paintings at a local auction in Istanbul selling for the equivalent of 3.5 million USD in December 2004 (Hurriyet Daily News, 2010).

Turkey's growth rate of 2.9 percent in 2014 and the growth of the export sector are some of the fundamental reasons related to the growth of the art market. Expansion in demand and sales rates, increasing demand for masterpiece works, the realization of new records at auctions and the development of significant private collections are among the changes expected to occur in the near future in Turkey with respect to the art market. In the course of the most recent 20 years, the Istanbul Biennial and the Contemporary Istanbul Art reasonable have made Turkish art more visible. The market value of art in general, which was 5 million TL in 2001, has grown incredibly and is estimated as being nearly 200 million TL today in Turkey. (Today's Zaman, 2013)

Thus, Turkey has made its appearance in the international art and finance scene as the site of one of the most promising and interesting new art markets. It has a relatively small group of remarkably rich collectors, who are interested in buying foreign works as well as domestic contemporary art works and in creating museums. Private-sector sponsorship has become the backbone of art through purchases because of the lack of significant government support and as a result of the commissions of major banks like Ziraat Bankasi, Garanti, Akbank, and Yapi Kredi Bank, and other art-savvy corporations. The Koc, Sabanci and Eczacibasi

families and lately the Ülker family, the founders of leading Turkish industrial dynasties, are investing heavily to build their own art collections. The Koç family, to give an example, has a private foundation and plans to open a new museum in 2016: it will display 800 works of art. The Eczacıbasi family already has its own museum, Istanbul Contemporary, as does the Sabancı family. (Reuters, 2013). International auctions have also led to record prices for Turkish modern art. At the second Sotheby's sale, in 2010, the highlights included Fahrelnissa Zeid's "Untitled (1958)" which was the first modern Turkish work to exceed \$1 million at a public sale, and the growing superstar Taner Ceylan's seductive "1881" (from the lost painting collection), which tripled its value from its presale estimate of £121,500. (Reuters April, 2013)

Auctions in Turkey have also been notable for ever increasing prices for Turkish paintings. Erol Akyavaş's painting titled "Kabe" (Kaaba) was sold for 2.9 million TL at a public sale in İstanbul. Bidding for the piece, which depicts the sacred cuboid building in Mecca, opened at 750,000 TL. The whole auction sales reached 87 million TL. Impressionist Turkish painter İbrahim Çallı was the top name on the list of 205 Turkish artists with high volume sales, his works generating sales of about 4.5 million TL, followed by Halil Pasha and Fahrelnisa Zeid, whose works were sold for more than 4.2 million TL and more than 3 million TL, respectively. The revenues of the California-based Turkish visual artist Canan Tolon was included in the Forbes Turkey listing. (Hurriyet Daily News, 2010)

Table 1-2 lists the artists who have fetched the highest price records in the domestic Turkish art auction scene for the last two decades. Alongside the aforementioned infrastructural developments, the rising prices of Turkish paintings may be considered to be a product of the economic prosperity of Turkey within the last three decades. Such initiatives may also reflect the extent to which Turkey's relatively new art market is expanding in unforeseen ways both domestically and internationally. This increase may also be attributed to the dynamics surrounding the small size of Turkey's art market and the currently high demand that it generates.

Table 1-2 - Painters whose work sold for record prices in Turkey in the last two decades and their paintings

Osman Hamdi Bey	Girl Adjusting Vase	TL 3,280,000
Erol Akyavaş	Kaaba	TL 2,900,000
Erol Akyavaş	I am the Truth	TL 2,780,000
Burhan Doğançay	Blue Symphony	TL 2,200,000
Nejat Melih Devrim	Revolution	TL 2,100,000
Erol Akyavaş	Fallen City	TL 1,641,000
Hasan Rıza	Fatih's Entrance to İstanbul	TL 1,260,000
Mübin Orhon	Abstract Composition	TL 1,010,000
Ferruh Başağa	Blue Mediterranean	TL 757,000
Orhan Peker	In the Sunflower Field	TL 695,000
Adnan Çoker	Retrospective	TL 682,500

Source: http://www.todayszaman.com/business_rise-of-art-investments-in-turkey_art-for-moneys-sake_313864.html

As an indicator of the improvement that happened between the periods of 2000-2008, in its 2009 annual report of the Turkish contemporary art market, ArtTactic, which provides unbiased art market research analysis reported that the domestic Turkish fine art auction market had developed four-fold in the consecutive 8 years, from USD 10.2 million in 2000 to USD 45.96 million in 2008. The developments of the Turkish fine art auction market has been stunning compared to the beginning of the 2000s, with 16 fine art auctions being held in 2000, increasing to 49 auctions in 2008, with a total of 8,000 lots entirely. (ArtTactic Annual Report 2009).

Owing to the Turkish economic crisis of 2001, the country's art market was hard hit by average auction prices falling more than 70 %. However, since 2001, the auction market has witnessed a significant rise in its average prices from USD 3,339 to USD 10,553 by the end of 2008, which signals a 316 % increase over the last 8 years alone. This increase is one of the primary reasons for the escalating interest manifested by international investors in the Turkish modern and contemporary art market, particularly within the last five years.

Providing interested potential investors with objective data on the Turkish art market has thus become more than an academic issue. As art can only prosper if and when it is supported by patrons, researching the Turkish art market can help its growth and progress not only by

revealing its true state, but also by generating objective data for the use of potential investors. This study was planned with this understanding.

We hope to contribute to the data concerning the Turkish art market with the current study. With respect to the “art” chosen as the subject of this study, it consists of the paintings of artists who were citizens of the Ottoman Empire or of the Turkish Republic, which were sold in auctions in Turkey. The expressions “Ottoman” and “Turkish” were used to indicate their citizenship and not as a sign of racial or ethnic distinction or discrimination. To avoid any bias resulting from personal preferences and tastes, no discrimination was made between painters or their works on the basis of their aesthetic characteristics either. Instead, all paintings that had been entered into auctions were accepted as having been assigned to the status of art by the Turkish art world. The producers of those paintings provided the general pool from which the study subjects were selected. Since paintings were the leading form of art works entered into and sold at Turkish auctions, they were considered suitable representatives of the art market as well as valid indicators of the interests of art investors in Turkey with the hope of providing potential investors interested in that market with objective and reliable data to help their decision making processes. This is, to the best of our knowledge, both the most extensive and the most recent study on the performance of Ottoman and Turkish artists at auctions realized to date. We look forward to realizing further related studies and seeing other investigators increase their efforts in this area. We sincerely hope that this study will provide stimulus for further research into this fascinating topic, which seems full of the promise of many new questions and investigation opportunities. As art can only live as long as there are those who rationally, emotionally and financially invest in it, such studies would not only help investors in art, but art itself to prosper and develop. We believe that this study may have relevance not only as a financial analysis of an emerging but very promising art market, and hopefully serve as a reminder of the value of art as the most humane endeavor possible. We will start with a review of the literature.

2. LITERATURE REVIEW

The general debate in financial art literature concerns the use of art as an alternative investment and is focused on the benefits of investing in art, its risk characteristics and its correlation with other asset categories.

Anderson (1974), Baumol (1986), Goetzmann (1993), Pesando (1993) and Renneboog & van Houtte (2002) concluded that art is not a useful alternative investment because its risk-return characteristics compare unfavorably with other assets and art should thus be bought primarily for its aesthetic value.

Baumol (1986) found that art prices behave randomly and that stock markets perform much better than art. Moreover, Goetzmann (1993) acknowledged that there might be a bias on the return on the investment value of art, as the artworks are most likely sold after an increase in which would then bias the return upwards. In price, concluded in its art market study of 2006 that “expensive” art is significantly more volatile compared to “cheap” art. The correlations between painting returns and the market alternatives were reported to be low, which agreed with Pesando’s findings (1993), but contrasted with those of Goetzmann (1993). Goetzmann (1993) did not formally estimate a Capital Asset Pricing Model (CAPM), but merely reported correlations between art returns and inflation, the Bank of England Base, consol bond returns and the London Stock Exchange. He found that at the high-end category, the returns were negatively correlated with stocks and long-term bonds. He argued that auction markets, especially repeat-sale records, may fail to capture price fluctuations of low demand or out-of-fashion paintings. Auction houses have little incentive to sell works with low public interest and owners may hold back in times of falling values.

Moreover, Renneboog and Spaenjers (2013) presented a comprehensive review of a data set of 1.1 million auction sales to investigate price formation and returns in the art market, over the period from 1957 to 2007. Their findings revealed that stable-quality art prices increased by a balanced 3.97 % in real USD terms on a yearly basis over the 1957-2007 period. Between 1982 and 2007, the geometric average annual real return was 5.19 %. After the 1950s, the findings of that study did not support the previous research reported by Goetzmann (1993) and Mei and Moses (2002).

On the contrary, Buelens and Ginsburgh (1993), Chanel et al. (1996), Mei & Moses (2002), Hodgson and Vorkirk (2004), Campbell (2005) and Worthington & Higgs (2005) argued that art provides some potential diversification benefits and could, therefore, be used as an alternative investment.

Mei & Moses (2002) found that art underperforms stocks but outperforms fixed-income securities and could be a useful tool for portfolio diversification. They proposed that art has lower volatility and lower correlation with other assets, thus making it more appealing for portfolio diversification than formerly thought. They described a masterpiece portfolio that has the top one-third of paintings by price and announced the masterpiece to be likely to have lower excess returns than non-masterpieces. Moreover, Worthington & Higgs (2005) determined the existence of opportunities for portfolio diversification in art alone or in alliance with equity markets, although the returns on art were much lower, and its risks were much higher than traditional financial markets.

External forces were also reported to be at play. Spaenjers (2013) identified economic growth, disposable income (especially of the wealthy class) and lagged equity returns as important determinants of art prices. As a luxury good, the art market strongly relies on a stable economy and the existence of wealthy class. Frey and Eichenberger (1995) argued that stock markets tend to respond with greater volatility to unexpected news; whereas the art market is subject to fashion, tastes, and booming markets, regardless of other economic developments, indicating that the two markets should be at least partially segregated.

Empirical findings of significant long-term relationships between the Russian and Chinese art markets, financial markets, and indicators of economic activity contradict results proffered by Chanel et al. (1996). Frey and Pommerehne (1989) noted that art investment acts better even if there is a period of high inflation and that it presents a financial capital.

Mei & Moses (2002) used the repeated sales technique to estimate rates of return on American paintings, Old Masters, and Impressionists. Although the repeated sales methodology has the advantage of calculating price indexes by strictly related assets, it has the limitations of not using all available information and of averaging across art schools and artists in computing a single rate of return. One of the main limitations of this approach is that many works of art are sold only once within the sample period. The correlations between

painting returns and the market alternatives were low, which agrees with Pesando's findings (1993), but contrasts with those of Higgs and Worthington (2005).

Although there are many studies concerning the art market of developed countries, unfortunately only a few studies have been carried out in developing countries to date. A recent study by Witkowska and Kompa (2014) explored a sample of 1710 paintings by 17 Polish artists whose paintings were often traded at auctions over the period of 2007 to 2013. A negative correlation between the Polish art market and the equity market was found in their study.

Kraeussl (2014) investigated the risk and return characteristics of investments in artists from the Middle East and Northern Africa (MENA) region and Turkey based on 3,544 paintings created by 663 MENA artists over the sample period of 2000 to 2012. With an exponential growth in sales since 2006, an annual geometric return of the MENA Art Index was a steady 13.9 percentage over the complete time period.

Testing the dataset concerning Latin American paintings auctioned by Sotheby's over the period of 1995 to 2002, Campos and Barbosa (2008) found that an artist's reputation and an artwork's provenance seemed to be greater critical determinants of the sale price of a painting, rather than factors such as the medium and size of an artwork. They also found that, contrary to previous research, experts' opinion had rather limited power in predicting the sale of an artwork.

In another study, Edwards (2004) examined 115 Latin American artists from 17 countries, for the period between 1977 and 2001. It was found that returns on Latin American art have a very low degree of correlation with the international painters' portfolio. This indicated that adding Latin American art will lower the overall risk of an international portfolio.

Lee et al. (2010) explored a data set of repeat sales of art and estimated a semi-annual index of artwork expenses for the period between 2000 and 2009 in the Asian Contemporary and Modern Art market. Contrary to other studies which demonstrated that returns on masterpieces were a great deal much less than the ones in the conventional art market, this study showed that the Asian Contemporary and Modern art marketplace was not a situation

to a “Masterpiece effect. Particularly, expensive art tended to surpass the rest of the market, achieving higher expected returns than lower-price-level artwork.

The conflicting and limited data on emerging art markets require further research, particularly with respect to the Turkish art market, which has been largely neglected by researchers until recently. To our knowledge, the only research on art investment in Turkey was realized by Seckin and Atukeren (2006). They researched the auction data pertaining to a select group of 13 painters for the period between 1989 and 2006. They observed that making an investment in the market for artwork in Turkey is a viable alternative even with a background of excessive inflation and massive macroeconomic volatility. The portfolio they studied yielded a small but high-quality real return. Nonetheless, marketplace inventory returns were better than the returns on the art market. Moreover, a high correlation was noted between investment returns and art market returns in Turkey. But, the returns in the art market were negatively correlated with the returns on alternative financial instruments in a developing country context, including foreign exchange, gold, and bank deposits. As a result, they concluded that art investment may be beneficial as a means of portfolio diversification. They calculated the returns of investments in art compared to returns from stocks, foreign exchange, bank deposits and gold over the period between 1989 to 2005 and found that investing in paintings by Turkish artists was a feasible substitute for investing exclusively in traditional assets in an emerging market, i.e., in an environment of high inflation, macroeconomic volatility, and political uncertainty. Later on, the same authors investigated the impact of economic crises on art investment in Turkey and found that the returns on art market investments appeared to boom during the 1994 crisis, but there was rather a dropped during the 1998 and 2001 crises. This may have been the result of data-related problems (e.g. lack of enough observations for 1994), or it may have been a base effect due to a slump in the market in the two previous years. In any case, the behavior of the art market was compatible with the behavior of the stock market in 1994, which also registered a substantial increase. The key here may be a comparison of the interest rate environment during the 1994, 1999, and 2001 crises. For example, there were positive real rates in 1994, while the real rates turned into negative in 1999 and 2001. Liquidity concerns and the debt profile (short-term vs. long-term) may also have played a role since investing in art objects is not as liquid as holding foreign currency at hand.

In 2007, Seckin and Atukeren researched for Canadian Art market, investigating the psychological aspect of art investment and calculated that the value of the psychic returns should be above 28 % per annum. Later on, Seckin and Atukeren (2009) expanded their research period for the Turkish art market to include the years 1990 to 2005. They concluded that, the prices in the Turkish paintings auctions and the international art market prices were co-integrated. This implies that, despite any short-term fluctuations, price developments in the Turkish and international art markets could move together in the long-run. These distinguished researchers then increased the number of painters evaluated for the same period to 74 and reaffirmed that investing in the art market was a feasible alternative to conventional investments even in the presence of high inflation and significant macroeconomic volatility. The returns in the Turkish paintings market hedged well against inflation with a real annual average return rate of more than 7 % during 1990-2005. Furthermore, the returns on oil paintings were found to exceed those of the overall market for paintings. They estimated that the returns of the Turkish paintings market might have been slightly higher than those of the Istanbul Stock Exchange (ISE 100) Market during 1990-2005 and may have exhibited less volatility. Investing in oil paintings was found to yield even higher returns. Next, they examined the Capital Asset Pricing Model (CAPM) relationship between the returns of investing in paintings and stocks in Turkey. They concluded that the beta was less than unity and that therefore investing in Turkish paintings market might help diversify a conventional financial asset portfolio. Due to the common influence of macroeconomic fluctuations on asset markets and given the shallowness of the Turkish paintings market and its positive correlation with the Istanbul Stock Exchange, they emphasized that a long time horizon view should be taken when investing in art markets.

Although extensive research has been carried out on the benefits of art investment, only a few studies exist which adequately cover the unfavorable sides of art investment. There are also several risks (except the risk of price variability of investment instruments) that are peculiar to the art market (Frey & Cueni, 2013). Frey & Pommerehne (1989) have described the tale of the painting “Daniel in Lion’s Den”. Artwork that has been repainted, damaged, improperly renovated or saved can also suffer a drop in fee

Art belongs to the organization of luxurious goods, and its value is very sensitive to the overall change in monetary situation and profits. Goetzmann et al. (2011) showed that the personal profits of the very best earners determine the price of artwork; a 1% fall in earnings of the earners in the pinnacle 0.1 % earnings distribution inside the United Kingdom triggers a decline in art fees of nearly 10 %.

Table 2-1 provides an overview of major studies corroborating this insight. If the art market is relatively small compared to the international art market, we can expect less annual returns than others (Witkowska and Kompa 2014). On the other hand, if the art market is at its peak level in terms of sales and expected to decrease gradually after years, nominal returns can be expected to be higher than other art markets (Mok et al., 1993; Seckin & Atukeren, 2009)

Table 2-1 Relative Returns of Art Reported in Other Studies

Author (Date)	Object of Study	Study Period	Annual Nominal Return	Annual Real Return
Ashenfelter et al. (1993)	Post-1960 Red Bordeaux	1952-1980	2.38%	(1.76)%
Byron and Ashenfelter (1995)	Post-1960 Australian	1961-1993	12%	4.3%
Burton and Jacobsen (1998)	Post-1960 Red	1986-1996	8.48%	3.70%
Ginsburgh and Penders (1997)	Conceptual Art	1972-1992	18.90%	12.66%
Pesando and Shum (1998)	Picasso	1977-1996	6.61%	1.48%
Pesando (1993)	Modern	1977-1992	7.27%	1.51%
Goetzmann (1996)	All types	1907-1987	8.24%	2.42%
Chanel et al. (1996)	Primarily Impressionists	1855-1969	6.20%	4.90%
Agnello and Pierce (1996)	Mostly 19th Century	1971-1992	9.30%	3.25%
De la Barre et al. (1994)	Great Masters	1962-1974	12%	7.83%
Chanel et al. (1994)	All types	1960-1988	11.8%	6.7%
Goetzmann (1993)	All types	1716-1986	3.20%	2%
Buelens and Ginsburgh (1993)	All types	1700-1961	1.49%	0.65%
Rouget et al. (1991)	Paintings From The 1950s	1960-1990	10.98%	5.9%
Frey and Serna (1990)	Old Masters	1981-1988	10.59%	3.20%
Frey and Pommerehne (1989)	800 best known painters of the World	1635-1987	3.9%	1.9%
Baumol (1986)	All types	1652-1961	1.25%	0.55%
Stein (1977)	Paintings before 1946	1946-1968	10.47%	7.8%
Anderson (1974)	All types	1780-1960	3.3%	2.6%
Seckin and Atukeren (2006)	1030 Paintings from Turkey	1989-2005	54.9%	0.6%
Seckin and Atukeren (2007)	1030 Paintings from Turkey	1990-2005	54.9%	3.4%
Seckin and Atukeren (2009)	4431 Paintings from Turkey	1990-2005	61.3%	7%
Mei and Moses (2001)	American Impressionists	1875-2000	-	4.9%
Renneboorg and Spaenjers (2013)	1 Million Paintings	1957-2007	3.97%	
Witkowska and Kompa (2014)	Polish Paintings	2007-2013	0.2%	
Seckin and Hodgson (2011)	Canadian Paintings	1968-2008	19%	0.10%
Pesando and Shum (1996)	Picasso Paints	1977-1993	0,12	!.4%

Source: Own elaboration

3. DATA AND METHODOLOGY

3.1. Data

We focus on the market for paintings in Turkey for the time period from 2006 to 2015 (November). The choice of painters to include in the dataset was a difficult task. However, our choice depended on the list of painters included in the previous studies focusing on the Turkish art market, so that we could make comparisons with indexes reported previously. The data of Seckin and Atukeren (2006) was based on auction records for a total of 1030 paintings made by 13 painters, auctioned between 1989 and 2006. Seckin and Atukeren (2009) later investigated 74 painters for the 1990-2005 time period. We included 77 painters in our study, thus making it the most extensive study on the Turkish art market to date. While it is not possible to claim that our study data reflects the entire market for paintings in Turkey, we believe that the list of painters is adequately diverse, and that the number is higher than any other study dealing with Turkey. The data set has 77 painters with 4915 observations for the time period between 2006 and 2015 (November). The initial data set comprised a higher number of observations. However we had to eliminate those lots marked as “not sold” (977), “not communicated” (35), “not listed” (553) and “withdrawn” (3) from the dataset. Also, we eliminated the artist who had 8 sales data. The final list of artists included in this study is given in Table 3.1. After determining the list of artists, we then collected sales data for our list of artists from Artprice.com. Prices considered were hammer prices excluding the transaction costs.

Table 3-1- List of Artists included in this study and their Life Spans (in alphabetical order according to their first names)

Artist	Life Span
Abdurrahman Öztoprak	1927-2011
Abidin Elderođlu	1901-1974
Alaattin Aksoy	1942-
Abidin Dino	1913-1993
Adnan Coker	1927-
Adnan Varınca	1918-
Ahmet Fazıl Aksoy	1949-
Ahmet Günesştekin	1966-
Ali Celebi	1904-1993
Asım İşler	1841-2007
Avni Arbaş	1919-2003
Ayetullah Sümer	1905-1978
Bedri Baykam	1957-
Burhan Dođançay	1929-2013
Bedri Rahmi Eyübođlu	1911-1975
Burcu Perçin	1979-
Canan Tolon	1953-
Cemal Tollu	1899-1968
Cihat Burak	1915-1994
Devrim Erbil	1937-
Ebru Uygun	1974-
Ergin İnan	1943-
Erinç Seymen	1980-
Erol Akyavas	1932-1999
Eşref Üren	1897-1984
Fahrelnissa Zeid	1901-1991
Ferruh Başađa	1914-2010
Feyhaman Duran	1886-1970
Fikret Mualla	1904-1967
Güngör Taner	1941-
Hakkı Anlı	1906-1991
Halil Paşaa	1852-1939
Hamit Görele	1900-1981
Hasan Vecih Bereketođlu	1895-1971
Hoca Ali Rıza	1864-1939
Hikmet Onat	1882-1977
İbrahim Çallı	1882-1960
İrfan Önürmen	1958-
İbrahim Balaban	1921-
İbrahim Safi	1898-1983
İsmail Acar	1971-
İsmail Namık	1892-1935

Table 3-1 (continued)

Kemal Önsoy	1954-
Komet	1941-
Leyla Gamsız	1924-
Leyla Gediz	1974-
Mehmet Güteryüz	1938-
Mehmet Ali Laga	1878-1947
Mehmet Gün	1954-2014
Mubin Orhon	1924-1981
Mustafa Ata	1945-
Mustafa Esirkus	1921-1989
Nazmi Ziya	1881-1937
Naci Balkan İslamiyeli	1947-
Naci Kalmukoğlu	1896-1954
Nedim Günsur	1924-1994
Nejad Melih Devrim	1923-1995
Neşet Günal	1923-2002
Nuri Abaç	1926-
Nuri İyem	1915-2005
Nurullah Berk	1906-1981
Orhan Peker	1927-1978
Ömer Uluç	1905-1988
Sabri Berkel	1907-1993
Sami Yetik	1878-1945
Selim Turan	1915-
Selma Gürbüz	1960-
Seref Akdik	1899-1972
Sevket Dag	1876-1944
Şadan Bezeyiş	1926-
Temür Koran	1960-
Taner Ceylan	1967-
Turgut Atalay	1918-2004
Turgut Zaim	1906-1974
Utku Varlık	1942-
Zekai Ormancı	1949-2008
Zeki Faik İzer	1949-2008

3.2. Methodology

There are two main approaches for constructing art price indexes: 1) Analyzing repeat sales of the same object at auction and 2) Developing a hedonistic model which considers the characteristics and qualities of individual works (Witkowska and Kompa, 2014). Repeat-sales regressions (RSR) take into account works that have been sold at least twice while controlling for differences in quality between them. Purchase and sale prices are used to estimate the average return of a portfolio of assets in each time (Renneboog and Spaenjers, 2013). The biggest problem with this methodology is the limited number of observations as it considers only repeated sales. Furthermore, an index composed of only twice-traded items may not represent the whole art market.

On the other hand, hedonic regression includes all sales data and controls for quality changes by attributing implicit prices to a set of painting characteristics. Then, time dummies are introduced to capture the time effect on art prices. The time coefficients represent the constant-quality price trends for the time period. To our knowledge, Court (1939) realized the first study using hedonic regression analysis in which the changes in automobile prices over time were analyzed in relation to performance characteristics. Later on, many researchers such as Chanel et al (1996), and Renneboog & Spaenjers (2013) used the hedonic model to construct art price indices.

In this work, we follow the literature and construct a price index for paintings using the hedonic regression methodology. As outlined before, the main advantage of this approach is that information on all observed transactions can be taken into account. Our model relates the natural logs of USD prices to year dummies while controlling for a wide range of hedonic characteristics, in keeping with the following equation:

$$\ln P_{kt} = a + \sum_{m=1}^M \beta_m X_{mkt} + \sum_{t=1}^T \gamma_t D_{kt} + \varepsilon_{kt} \quad (1)$$

Where P_{kt} represents the price of painting k at time t , X_{mkt} is the value of characteristic m of item k at time t , and D_{kt} is a time dummy variable that takes the value one if object k is sold in period t (and zero otherwise). The coefficients β_m shows the attribution of a relative shadow price to each of the m characteristics. In order to construct the art price index that

controls for time variation in the quality of the art sold, we use the antilog of the coefficients of years. Therefore, the value of the hedonic index in year t is:

$$\Pi_t = \exp(\gamma_t) \times 100 \quad (2)$$

The initial period (the year 2006) is not included in the model to avoid dummy trap. So, the coefficient of this year is 0 meaning that the index value of 2006 is 100. The return in year t is calculated as:

$$r_t = \frac{\Pi_t}{\Pi_{t-1}} - 1 \quad (3)$$

3.3. Variables

Paintings are heterogeneous assets and a variety of physical and non-physical characteristics cause a painting to be unique (Kraeussl and Lee, 2010). To construct a useful predictive model, we use hedonic modeling including control variables that capture the characteristics of the artist, of the painting and of the sale. The dependent variable is the natural logarithm of the hammer (sales) price in USD. All prices are nominal and the price index calculated is also in nominal terms (Higgs, 2010). We introduce a series of independent variables mostly in line with the literature while due to data availability we were not able to use some variables such as signature, topic variables, etc.

We introduce the names of the artists as dummy variables to capture each artist's uniqueness. Also a "dead" dummy is used as it is often assumed that prices for paintings increase after the death of an artist. Moreover, we categorize the artists as Ottoman and Contemporary artists, considering that the art world in Turkey was profoundly altered as a result of Atatürk's reforms, which were deeply symbolic insofar as the task of building a new Turkish nationality and cultural identity was concerned. New generation of graduates from the Fine Arts Academy grouped together to form the "New Painting Society" in 1923. This group considered itself to be the true representative of the "Generation of the Republic" and as such, were novel only to the degree that they dealt exclusively with revolutionary themes and were united in their desire to utilize art as a means of reinforcing the reforms of the new

Republic and promoting the paradigm of the “free Turk” of the future versus the “Ottoman subject” of the past (Aslier et. al, 1998).

The next set of variables is related to the characteristics of the painting. The first group is dummy variables identifying the medium of the work: namely, acrylic (ACR), mixed media (MIX), oil (OIL), and others (OTH). The reference category is other mediums. We do have complete data about the support on which the painting was made. The second group of physical characteristics comprises the dimensions of the painted work as represented by surface area (Area) in square centimeters (cm²) and surface area squared (Area²) as the non-linear component.

4. FINDINGS

For the time period of 2006-2015 and for the painters included in this study, the mean price realized at auctions for paintings in the Turkish art market was TL 63,808.33 TL and USD 36,596.97. The minimum sales price was USD 445 and the maximum selling price was 1,498,297 dollars. The minimum and maximum sale prices in Turkish Lira were 783,531 and 2,310,305 TL, respectively.

Table 4-1 lists the top ten artists in Turkish auctions of paintings made by Ottoman and Turkish Artists during the time spanning 2006 to 2015 .During this time period, Burhan Doğançay was the artist whose works reached the highest total sum in auction sales in Turkey, and the list ends with Kemal Önsoy.

Table 4-1 Top Ten Turkish Artists in Turkish Auctions during the 2006-2015 Period Listed According to Their Total Turnover

Top 10 Artist For The 2006-2010 Period			
	Artist	Turnover (\$)	# of Lots Sold
1	Burhan Doğançay	20.215.589	354
2	Erol Akyavaş	18.632.722	192
3	Fahrelnissa Zeid	16.940.551	248
4	Mubin Orhon	15.970.129	317
5	Nejad Melih Devrim	13.920.461	445
6	Ömer Uluc	12.844.479	262
7	Ferruh Basaga	7.597.029	176
8	Mehmet Güteryüz	6.263.738	141
9	Adnan Coker	6.141.582	99
10	Kemal Önsoy	5.953.863	238

Source: Own *elaborations* based on Artprice data

However, the ranking order of the same artists changes when their average sale prices are calculated. As can be appreciated from Table 4-2, when ranked not by total but by average sale value, Erol Akyavaş emerges as the leading artist in Turkish auction sales in the same period. He is followed by Fahrelnissa Zeid and Adnan Çoker, with Burhan Doğançay taking 4th place when ranked in this manner. The example of Adnan Çoker is particularly instructive: Although his rank for total sales was 9th in order, he rose to 3rd place when the average price of works was used as an alternative method of ranking. This shows that comparisons between artists should not be made solely on the basis of their total sales, but should also take into consideration their average sale prices and their change over time, whenever possible.

Table 4-2. Top Ten Turkish Artists in Turkish Auctions during the 2006 - 2015 Period Listed According to Their Average Sale Prices

Rank according to average price	Rank according to total sales	Artist	Average price (USD)
1	2	Erol Akyavaş	97,045
2	3	Fahrelnissa Zeid	68,309
3	9	Adnan Coker	62,036
4	1	Burhan Doğançay	57,106
5	4	Mübin Orhon	50,378
6	6	Ömer Uluc	49,025
7	8	Mehmet Güteryüz	44,424
8	7	Ferruh Başağa	43,165
9	5	Nejad Melih Devrim	31,282
10	10	Kemal Önsoy	25,016

Source: Own calculations based on ArtPrice data

Table 4-3 shows the estimates of the hedonic variables for Equation (1) which is estimated using ordinary least squares (OLS) and the dependent variable is the natural log of the dollar prices and Turkish lira price. In addition to the coefficient estimates of variables, Table 4-3 also shows the “price impact” of each hedonic variable, which can be proxied by taking the exponent of the coefficient and subtracting one.

Table 4 3. Annual Hedonic Regression Results Estimated for the Turkish Auction Sales of 77 Ottoman and Turkish Painters between 2006 and November 2015

	Dollar		Turkish Lira	
	Coefficients	$\exp(\beta) - 1$	Coefficients	$\exp(\beta) - 1$
2007	0.5574*** (0.1230)	74.62%	0.3683*** (0.1226)	44.54%
2008	0.4524*** (0.1188)	57.22%	0.3833*** (0.1184)	46.72%
2009	0.7387*** (0.1173)	109.33%	0.7874*** (0.1169)	119.77%
2010	0.9115*** (0.1169)	148.82%	0.9549*** (0.1166)	159.84%
2011	0.8872*** (0.1174)	142.85%	1.0451*** (0.1170)	184.38%
2012	0.6960*** (0.1175)	100.59%	0.9158*** (0.1172)	149.88%
2013	0.5410*** (0.1175)	71.78%	0.8183*** (0.1171)	126.67%
2014	0.4173*** (0.1184)	51.79%	0.8353*** (0.1180)	130.56%
2015	0.2923** (0.1174)	33.96%	0.8813*** (0.1171)	141.41%
Title	0.1122*** (0.0221)	11.88%	0.1101*** (0.0220)	11.64%
Dead	0.2086*** (0.0582)	23.20%	0.2100*** (0.0580)	23.37%
Ottoman	1.0717*** (0.3207)	192.05%	1.0593*** (0.3198)	188.45%
Area	8.64E-05*** (1.56E-06)	0.01%	8.61E-05*** (1.55E-06)	0.01%
Area2	-4.33E-10*** (1.68E-11)	0.00%	-4.32E-10*** (1.68E-11)	0.00%
Oil	0.2838 (0.2719)	32.82%	0.3312 (0.2711)	39.27%
Mixed	0.1254 (0.2737)	13.36%	0.1726 (0.2729)	18.84%
Acrylic	0.3691 (0.2744)	44.66%	0.4174 (0.2735)	51.82%
Artist dummies	YES		YES	
Constant	5.5510*** (0.3686)		5.8934*** (0.3675)	
Observation	4915		4915	
F Statistics	113.25		115.28	
R2	0.6836		0.6874	
Prob > F	0.0000		0.0000	

Note: Table 4-3 presents the baseline hedonic regression results. Equation (1) is estimated using OLS. We report the coefficient (β), the standard deviation in parenthesis, and the price impact (i.e., the exponent of the coefficient minus one). ***, **, * represents the significance level at 1%, 5% and %10, respectively.

Based on the coefficients on the time dummies we construct art price index Π and the results are presented in Figure 4-4. The price levels in 2006 are standardized to 100. Table 4-4 presents the art price indices and returns for the hedonic regression model detailed in Table 4-3. The dummy coefficient for each year (γ), the standard deviation (S.D.), the price index and return (Π and r) are also shown. Figure 1 graphically depicts the evolution of the indices over our time frame and compares it with the movement of the Global ArtPrice and Paintings Index.

According to the findings, works with a title are on average priced around 11 % higher than works without a title. In addition, we observe a strong “Ottoman” effect on prices. The works of Ottoman artists are on average priced at 192 % (188 % in TL) higher than the works of Contemporary artists. Works are on average priced 23 % higher after the death of an artist. We did not observe a difference between the prices of oil, acrylic, and mixed media paintings. Furthermore, prices increased with size, up to the point that the work probably became too large for convenient display, as indicated by the negative coefficients of the squared area terms.

Table 4 4. Paintings Market Index of Turkey

Year	γ_{TL}	Std. Err.	γ_{Dollar}	Std. Err.	Π_{TL}	Π_{Dollar}	R_{TL}	R_{Dollar}
2006					100	100		
2007	0.3683	0.1226	0.5574	0.1230	144.5399	174.6157	44.54%	74.62%
2008	0.3833	0.1184	0.4524	0.1188	146.7152	157.2164	1.50%	-9.96%
2009	0.7874	0.1169	0.7387	0.1173	219.7684	209.3307	49.79%	33.15%
2010	0.9549	0.1166	0.9115	0.1169	259.8431	248.8197	18.23%	18.86%
2011	1.0451	0.1170	0.8872	0.1174	284.376	242.8526	9.44%	-2.40%
2012	0.9158	0.1172	0.6960	0.1175	249.8848	200.5873	-12.13%	-17.40%
2013	0.8183	0.1171	0.5410	0.1175	226.675	171.7809	-9.29%	-14.36%
2014	0.8353	0.1180	0.4173	0.1184	230.5614	151.7888	1.71%	-11.64%
2015	0.8813	0.1171	0.2923	0.1174	241.4068	133.9605	4.70%	-11.75%

From Figure 4-1, we can see that Art Price indices moved in a narrow range and did not fluctuate dramatically between 2006 and 2015. On the contrary, the paintings market index of Turkey experienced a sharp increase from 2006 to 2011 (while having a small decline due to the global crisis). After 2011, there was a decrease in the paintings market index (especially in dollar terms). Average yearly return from 2006 to 2015 for the Turkish Paintings Market is 12.06 % and 6.57 % for TL and Dollar index, respectively while the return of Art Price Global (USD) is only 1.46 % and the return of Art Price Paintings index was -1.67%

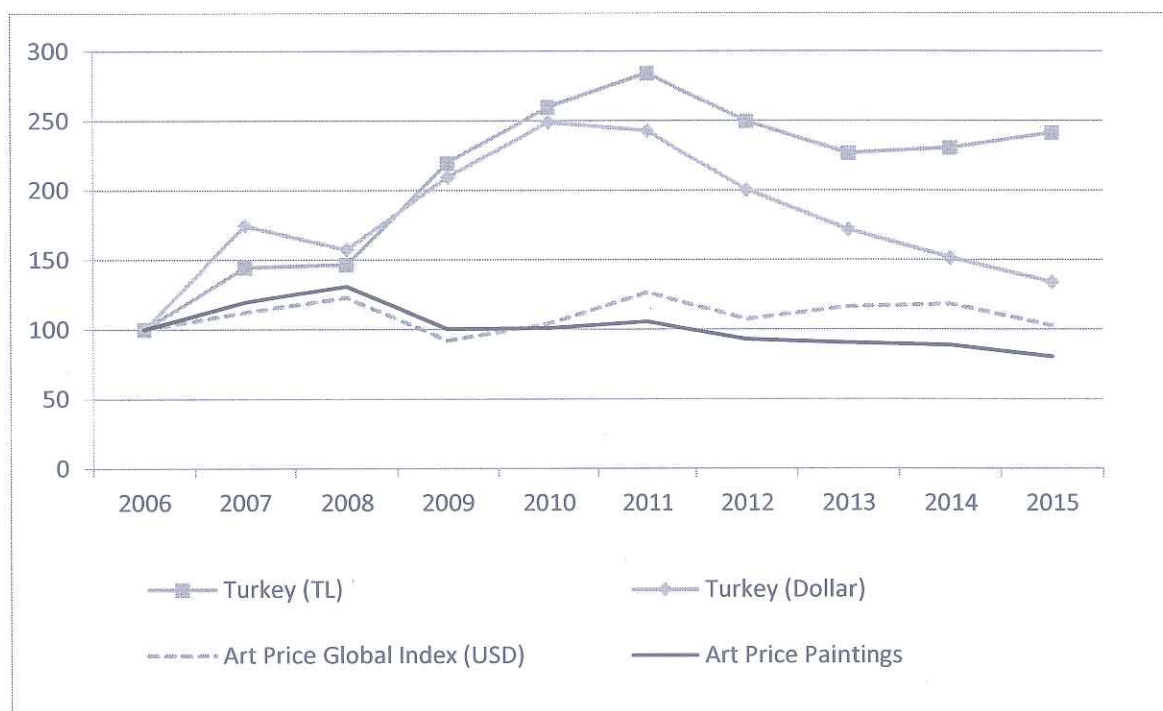


Figure 0-1 Graphical Comparison of Hedonic Price Indices of Turkey, ArtPrice Global Index, ArtPrice Paintings Index

Note: Turkey (TL) and Turkey (Dollar) represents the price index for the Turkish paintings market in Turkish Lira and Dollar, respectively. ArtPrice Global Index and Paintings Index data is available quarterly. We calculated the annual index data by getting the average of quarterly index values.

Table 4-5 shows the average yearly real returns and volatilities calculated over the periods 2006-2015 (November). Compared to the other investment options (Dollar, Euro, and S&P 500), art did relatively well. Over the shorter time frame (since 2006), the risk-return profiles of art only compared favorably to that of other real asset classes. Our comparison does not take into account differences in transaction costs, which are high for art investments. The total commission cost to buyers and sellers is said to be around 8-15 %. In addition, a value-

added tax of 18 % (as of 2006) is to be paid by the buyer both on the hammer price and on the amount of commission paid to the auction house in Turkey (Seckin and Atukuren, 2006).

As we can see from Table 4-5, house price index (12.14 %) has returned slightly higher than paintings market index for Turkey (12.06 % in Turkish Lira) .However, we have to mention that our data for house index covers the after 2010 period. Moreover, Istanbul Stock Exchange (ISE) 100 index is riskier than other investment alternatives because of higher standard deviation. Surprisingly, ArtPrice painting index returns negatively for the last 9 years.

Table 4 5.Comparison of investment performance

	Mean	Std. Dev.
Paintings market index of Turkey (TL)	12.06%	0.2190
Paintings market index of Turkey (Dollar)	6.57%	0.3066
ArtPrice Global Index (USD)	1.46%	0.1565
ArtPrice Paintings Index	-1.67%	0.1260
Cumhuriyet Gold Selling Price (TRY/Number)	16.63%	0.1685
Bullion Gold Selling Price (TRY/Gr)	16.91%	0.1674
1 Ounce Gold London Selling Price (USD/Ounce)	8.85%	0.2074
BIST 100	16.04%	0.4616
Euro	7.77%	0.1406
Dollar	10.10%	0.1702
House Price Index	12.14%	0.0295
S&P 500	5.16%	0.1835
MSCI World	6.46%	0.2098
MSCI Emerging markets	7.61%	0.3766
Government bond yields, 10 years' maturity	11.47%	0.0393
Weighted Average Interest Rates For Deposits in Turkish Lira (Up to 1 Year)	11.90%	0.0382

Source: Central Bank of the Republic of Turkey, Eurostat, MSCI, ArtPrice

Table 4-6 shows the correlation matrix of real returns for the 2006-2015 (November) time frames. Correlation coefficient ranges between -1 and +1. Perfect positive correlation (a correlation coefficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random.

Our art index and the bullion gold, Cumhuriyet gold and 1 ounce gold, our correlation analyses showed that, the paintings market hedonic index of Turkey and , ArtPrice Global Index and ArtPrice Paintings Index were positively correlated (correlation coefficient were also and even more strongly correlated (correlation coefficient 0.75 or higher). On the other hand, the MSCI World and the House Price Index were negatively correlated with the Turkish painting market index. As a result, due to its negative correlation with MSCI World and House Price Index, investing in paintings in Turkey should be considered not as the only method of investment, but as a valid and reliable means of portfolio diversification and risk hedging. The results of this study, which is, to our knowledge, the most extensive and most recent study on the auction performance of Turkish and Ottoman painters and paintings realized to date, not only support the findings of the pioneering work of Seckin and Atukeren, but also provide further objective data that can be of use to potential investors in the Turkish art market.

5. CONCLUSION

We hope to contribute to the data concerning the Turkish art market with the current study. On the “art” chosen as the subject of this study, it consists of the paintings of artists who were citizens of the Ottoman Empire or of the Turkish Republic, which were sold in auctions in Turkey. The expressions “Ottoman” and “Turkish” were used to indicate their citizenship and not as a sign of racial or ethnic distinction or discrimination. To avoid any bias resulting from personal preferences and tastes, no discrimination was made between painters or their works based on their aesthetic characteristics. Instead, all paintings that had been entered into auctions were accepted as having been assigned to the status of art by the Turkish art world. The producers of those paintings provided the general pool from which the study subjects were selected. Since paintings were the leading form of artworks entered into and sold at Turkish auctions, they were considered suitable representatives of the art market as well as valid indicators of the interests of art investors in Turkey. This is, to the best of our knowledge, both the most extensive and the most recent study on the performance of Ottoman and Turkish artists at auctions realized to date. It was designed and conducted with the hope of providing potential investors interested in the market with objective and reliable data to help their decision-making processes. We look forward to realizing further related studies and seeing other investigators increase their efforts in this area. We sincerely hope that this study will provide stimulus for further research into this fascinating topic, which seems full of the promise of many new questions and investigation opportunities. As art can only live as long as there are those who rationally, emotionally and financially invest in it, such studies would not only help investors in the art, but art itself to prosper and develop. We believe that this study may have relevance not only for a financial analysis of an emerging but very promising art market, and hopefully serve as a reminder of the value of art as the most humane endeavor possible. We will start with a review of the literature on research concerning art markets in the world and Turkey. Prior research, recent developments and positive outlooks indicate that researching the financial performance of Ottoman and Turkish artists would be very helpful for potential investors. This is particularly true in light of the very few number of studies realized concerning this subject.

Consumers can by no means be sure that the bought object is unique and is not a copy or forgery. Although the artwork is an authentic piece, it is very hard to realize who the painter was: The master himself, his or her circle, or a later copyist. Owners of artwork may also worry that the masterpieces they possess might be stolen, destroyed (through fireplace, revolution, etc.) or seized by authorities as a part of “national heritage”. Possession of valuable artwork can necessitate additional taxes (sale or property taxes), and the government may also impose new export regulations. Tastes and trends can change over the years, and the art market is characterized by extreme heterogeneity. Thus, it is not possible to foresee whether or not a certain artist will “fall out of fashion” at some point in the future.

Behavioral anomalies appear to play a vital function in the art marketplace on the grounds that creditors are generally unwilling to sell pieces of art from their collections, and they tend to shop for artwork created via national artists. According to ArtTactic, the key challenges are the unregulated nature of the art market, lack of transparency and of information. The increase over the last three years is likely to be a consequence of greater engagement between the wealth management industry and the art market, rather than the art market becoming less transparent.

In our study, we observe a strong “Ottoman” effect on prices. The works of Ottoman artists are on average priced at 192% (188% in TL) higher than works of contemporary artists. Works are on average priced 23% higher after the death of an artist. We don't observe a difference between the prices of oil, acrylic, and mixed media paintings. Furthermore, prices increase with size, up to the point that the work becomes too large. The paintings market index of Turkey experienced a sharp increase from 2006 to 2011 (while having a small decline due to the global crisis). After 2011, there is a decrease in the paintings market index (especially in dollar terms). Average yearly return from 2006 to 2015 for the Turkish Paintings Market is 12.06% and 6.57% for TL and Dollar index, respectively while the return of Art Price Global (USD) is only 1.46% and the return of Art Price Paintings index is -1.67%. Cumhuriyet gold and 1 ounce gold on the other 0.75 or higher. Thus, there is a significant positive correlation between them. On the other hand, MSCI World, House Price Index is negatively correlated with Turkish painting market index. As a result, due to its negative correlation with MSCI World, House Price Index, investing in paintings with the purpose of portfolio diversification and hedging for risks. House price index (12.14%) has returned slightly higher than paintings market index for Turkey (12.06%) in Turkish Lira.

However, we have to mention that our data for house index covers after 2010 period. Moreover, Istanbul Stock Exchange (ISE) 100 index is riskier than other investment alternatives because of higher standard deviation relative to others. Surprisingly, ArtPrice painting index returns negatively for last 9 years.

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