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Dynamics of The Turkish Art Market: A Comprehensive Empirical Study

Türk Sanat Piyasasinin Dinamikleri: Geniş Kapsamli Ampirik Çalişma

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ABSTRACT

This dissertation constructs the most comprehensive art price index in Turkey and uses 32,391 manually collected sales transactions, including artworks of 413 artists over the period 1990–2016. Furthermore, the dissertation updates the art market data till 2016, and from the period of 2005–2016 is a crucial and interesting period as Turkey not only experienced record high growth rates but also witnessed political stability. The art market has grown steadily over the period under concern. However, stability leaves to uncertainty, and since 2011 Turkey and its region have experienced a political instability and uncertainty. The results indicate that the Turkish art market underperforms the domestic stock market, but leading to the higher returns compared to global art- and stock markets. The results from the causality analysis indicate that there is a feedback effect between the domestic art- and the stock markets. The dissertation also finds that the Arab Spring and the political risk in Turkey are among the main reasons for the diminishing returns of the Turkish art market after 2010.

ÖZET

Bu tez, Türkiye'de en kapsamlı sanat değeri endeksini oluşturmaktadır ve 1990-2016 döneminde 413 sanatçının satışa çıkmış 32.391 adet eser verisinin şahsen toplananmasından oluşmuştur. Ayrıca, Türk sanat piyasasındaki 2016 yılına kadar olan veriler de bu tez ile güncellenmiştir. 2005 - 2016 dönemi içerisinde Türkiye yüksek hızlı büyüme oranlarının yanı sıra siyasi istikrara da tanık olduğu için bu dönem çok önemli ve ilginçtir. Sanat piyasası, ilgili dönem boyunca istikrarlı bir şekilde büyümüştür. Bununla birlikte, istikrar belirsizliğe yol açmıştır ve 2011'den bu yana Turkiye ve bölgesinde siyasi bir istikrarsızlık ve belirsizlik yaşanmaktadır. Elde edilen sonuçlar, Türk sanat piyasasının yerel borsaya göre performansını düşük seviyede olduğu, ancak global sanat ve borsalara kıyasla daha yüksek getirilere neden olduğunu göstermektedir. Nedensellik analizinin sonuçları, yerel sanat piyasası ve borsalar arasında bir geribildirim etkisi olduğunu göstermektedir. Ayrıca bu tez, Arap Baharı'nın ve Türkiye'deki siyasi riskin, 2010'dan sonra Türk sanat piyasasının azalan getirilerinin başlıca nedenleri arasında yer aldığını bulmaktır.

1. INTRODUCTION

"How big is the art market?" and "what are the determinants of the return art markets in developing and advanced countries?" Although the answers to these questions are increasingly relevant issues in the literature, the answers given are different from each paper and data source. For example, while according to the European Fine Art Foundation (TEFAF) (2017), total global sales of art increased from $44 billion to $45 billion in 2016, which is consist of $26 billion sales by dealers, $17 billion sales by auction houses, and $2 billion sales by private auctions. Furthermore, Europe has the most significant share of the art market sales with $20.50 billion, after Americas has the second largest sales with $14.50 billion and the remaining $10.71 billion is representing the Asian art market. Particularly in Asia, Middle East has strong growth results. In addition to this, art and antique import and export trade are continuously increasing from 1988 to 2015, and the majority part of it is paintings. Also, TEFAF's report is emphasizing that the dealer side of the auction houses' figures not be fully transparent even they are readily available; so totally defining the size and volume of the art market is not possible. The main reason is art galleries, and dealers are small enterprises in many cases without employees. Therefore, some trades may go unreported, and sales go through off-shore

arrangements or unrecorded into tax heavens. Moreover, the art market sales are moving from auction houses to dealers and private sales by auction houses. The shift from the auction house to private sales has been less notable in the art market of Asia.

The Art Basel and UBS (2017) estimated the sales at $56.6 billion in 2016 with a decrease of 11% from 2015. The main reason for the decrease in global sales was a sustained cooling of sales in specific sectors of the art market and fewer high-end sales, especially in the fine auction art market. The U.S. art market was affected by the global recession in 2009 and sales falling more than 50% between 2007 and 2009 to a low of $12 billion. Nevertheless, the art market in the U.S. had one of the strongest and quickest recoveries with more than doubled size growth by 2015, especially in Contemporary and Modern art in the fine art market. The decrease in 2016 broke the trend of growth, and the market size is returned to 2013 levels. The second largest market worldwide in 2016 is the U.K. art market with a share of 21%, merely ahead of China. The level of sales decreased by 18% lower than ten years previously in 2016. According to the report, one of the leading reason for the regression was the unexpected vote for leaving the European Union in June 2016, and it caused considerable speculation about the effects of Brexit would have on the art

market. On the contrary, the U.K. art market may be free to develop its terms of trade with non-EU countries.

However, although the numbers and results might vary depending on the data source, the art market has made essential progress in the world. The three biggest art markets are the United States (U.S.), the United Kingdom (UK), and China with the shares of 29.5%, 24%, and 18%, respectively. Asian countries dominate the world auction sales with a share of 40.5% in 2015 (The European Fine Art Foundation, 2017). Indeed, the role of emerging markets has been increasing while outperforming the mature markets in the last few years. However, since 2009 the returns in the art markets has been at the lowest level due to the financial crisis of 2008–9 (Art Basel and UBS, 2017).

In line with the developments in the world, art market in Turkey has been developing rapidly especially during the last decade. The rapidly growing economy backed by political stability has increased the interest of people to art in Turkey. Since the financial crisis in 2001, the economy has stabilized and per capita income almost tripled in the last decade. It is assumed that the value of the art market in Turkey reached to $350M in 2016 up from $5M in 2001. During this period, Ottoman painter Osman

Hamdi Bey's painting "In Front of the Green Mosque" was sold in a record bid of $4.5M in May 2016. The previous record once again belonged to Osman Hamdi Bey's another painting named "The Tortoise Trainer" which sold for $3.5M in 2004. However, the increasing uncertainties in the region and Turkey in the last couple of years is expected to have a deterring effect on the art market.

In line with these developments, the aim of this dissertation is to construct a yearly price index for the Turkish Art Market (henceforth TAM) for the time period of 1990–2016. This index is the most compressive measure in the literature that presents the price movements and the returns in the TAM. Therefore, the construction of the TAM provides a better understanding of how the art market performed over the years. Besides, the returns of the TAM are compared with the returns of the traditional financial assets, such as the Borsa Istanbul stock market (BIST), gold, and interest rates. Moreover, the dissertation not only analyzes how domestic economic and political events affect the performance of the TAM, but also implements a causality analysis to examine the interactions among the TAM, the Global Art Price Paintings Market, the BIST, and the S&P 500 indexes. These empirical analyses can illustrate the diversification benefits in art market investments.

The previous literature constructs a variety of art price indices for different artworks and focuses on different countries. While the number of studies focusing on advanced economies is quite rich, there is a limited literature on the art market of developing economies. Since there could be a home bias in the art markets we can expect higher returns in the paintings in emerging markets than the advanced economies. This is a noteworthy issue in the art markets in BRIC countries, especially during the last decade (see, e.g. Renneboog and Spaenjers, 2015); and therefore, we test the validity of this hypothesis in Turkey. Indeed, Turkey is a growing economy and the per capita income was $4,316 in 2000 and it has been in $12,542 in 2013. However, the political issues after 2013 have decreased the per capita income to $10,787 in 2016. Besides, the GDP grows at an average of 5.1% per annum from 2000 to 2016 according to the World Bank data. The growth rate of the GDP in Turkey is significantly higher than the world average (2.9% per annum) during the period of 2000–16.

The Turkish arts have a growing interest due to its rich history of visual arts. In addition, due to the unique characteristics of art market such as lack of market transparency, liquidity, and auction commission, art market participation mostly belonged to a select class of wealthy individuals. Therefore, most of the studies dealing with art mark are performed in

wealthy societies and countries. However, newly created wealth in emerging economies such as China, Russia, and the Middle East, has increased the number of shares in the art market. At this point, there are simply a few studies examining the returns in the Turkish art market and its relationship with international art markets. To the best of our knowledge, the first index for the paintings market in Turkey is developed by Seçkin and Atukeren (2006). Their dataset consists of only 1030 sales of 13 artists while 827 of the total sales took place between January 2000 and April 2006. By using a dataset of 4431 paintings of 74 Turkish artists, Seçkin and Atukeren (2009) reconstruct the hedonic price index for the period from 1990 to 2005. In addition, a separate price index of oil paintings based on 3365 observations is also developed. The returns of the art market in Turkey are 61.3% (nominal) and 7% (real). Furthermore, the art price index had been quite volatile, which was mostly due to the economic developments (high inflation and financial crisis) in Turkey in the given period. Kräussl (2015) examines the risk and the return characteristics of art in the Middle East and Northern Africa (MENA) region and Turkey for the sample period from 2000 to 2012. The dataset includes 3,544 paintings by 663 MENA artists. The Turkish artists have the maximum number of sales with 814 paintings accounting almost a quarter of total sales volume. The art index return is found to be 13.9%,

which is higher than the stock market return of 4.5%; however, the volatility of the art market is insignificantly higher than the stock market volatility.

The dissertation contributes to the current literature in different respects. First, the dissertation enhances all of these datasets in terms of the coverage period, the number of artists, and sales transactions in Turkey. Second, The dissertation is the first that examines the effects of political risks and political instability in the MENA countries (known as the Arab Spring) on the return of the TAM. The dissertation illustrates that Arab Spring and the higher degree of the political risk in Turkey have negatively affected the return of the TAM.

The rest of the dissertation is constructed as follows. Part 2 analyzes the data; part 3 explains the econometric methodology; part 4 addresses and discusses the empirical results from various techniques. Section 5 provides the conclusion.

2. LITERATURE REVIEW

Baurnol's (1986) approach to art investment is more skeptic than the others, and he is questioning the comparability of equilibration mechanism of art and securities markets. His first approach is the homogeneity of two investment types, stock market securities are homogeneous because of a vast number of a particular stock. On the contrary, artworks are unique, and even if one artist works on a painting two times, he/she can not make them perfectly same. Second, many individuals can hold a given stock for trading, though who has the Card Players by Paul Cézanne, or La Rêve by Pablo Picasso assumed a monopoly on the art market. Third, stock market transactions happen frequently and relatively easier than art market. Even if ones have any art object, selling it could happen once in a century. Fourth, a price of stock generally affected by public information, also, the price of artwork is known who is involved the auction or selling process. Furthermore, Baumol claims that the price information of artworks is not realistic and this has an effect on the impedition of equilibration. Concerning efficient market hypothesis stock price reflects the related information, likewise, in the case of stock, it is known that the stock's pro rata share of the present discounted value of the company's expected flood of future earnings. Defining the future price of a painting is not that easy,

and Baumol is also asking that who would attempt to declare to know the right equilibrium price of artwork? By his observations, on the average, the purchase and consequent resale of a painting brought an annual compounded rate of return of 0.55 percent in real terms. The median was somewhat higher than 0.85 percent (Baumol, 1986). The paper compares to rate of returns between government bonds and investment on paintings and finds 2 percent point loss per year against to government bonds which hold of the canvas.

Frey and Eichenberger (1995)' article concentrate on psychic returns of art investment and looks to the behavioral points and constructed on their previous work. They are combining the studies under four major problems, such as data, transaction cost, taxation, and comparison to financial assets. The tender of the paper is a significant characteristic of art markets is the more significant importance of behavioral anomalies. (Frey and Eichenberger, 1995). This hypothesis based upon three reasons. The first one is most of the private collectors are not oriented to yield a profit of their ownership of art collections. The second one is corporate collecting, and this one is under the top managers' discretionary consumption purposes. The last one is actions of public museums which are managed by the managers who tend to transfer their anomalies to the museum.

According to the paper, the return of art investment is not only based on expected price rises but also psychical return such as a consumption good, and they are arguing on five causations of disequilibria, such as change in risk, chance in cost, change in genres and tasted, unexpected change in taxes and regulations.

Ginsburgh and Jeanfils (1995) construct their study on three groups of painters whom their works publicly auctioned in New York, London and Paris between the period from 1962 and 1991. They use three data bases for their work; the first one includes 25,00 sales of 82 famous Impressionist, Modern, and Contemporary European painters who lived in Paris and called Great Masters in this paper; the second one includes randomly selected 6,000 sales of 200 paintings which are called Other Painters in this paper from also Mayer; the third one is compiled by Demortier (1992) with 6,000 paintings of 139 American painters who born after 1900 and/or died after 1965. Hedonic regression helps them to construct indices of defined art markets, and they do not use repeat sales regressions because of observable limited number of resales. The results of their work show us prices have no diversion in the long run. The paper also checks cointegration between locations and for Other Painters, London and Paris's trends are quite similar, for Great Masters, there is a

unique cointegrating relation between the three locations (Ginsburgh and Jeanfils, 1995). They are also examining the relations between art markets and individual stock markets such as Tokyo, New York, London, and Paris. Stock markets (especially Tokyo) have a short-run effect on paintings by Great Masters, and the Paris stock exchange has an impact on Other Painters only (Ginsburgh and Jeanfils, 1995). As a conclusion, although all three markets follow the same route, the correlation between art markets and the stock market is somewhat ambiguous. The stock market has an impact on art markets in the short-run; however, the opposite is not clear according to the data which they obtain.

Agnello and Pierce (1996) examine returns on art investment with using hedonic price regressions for paintings. Their results are in line with general findings of past studies for the return rate of art investment. The data set of their work constructs on the sample of paintings via 66 American painters who is works are sold in the auctions between 1971 and 1992. Their model uses a log linear price regression estimated by pooled cross section and time series data and allows rates of return besides hedonic values for various painting and auction attribute to be estimated. Their variables for examining the price and returns of paintings based on the condition of the piece, his/her age when the painter made and the state of

the artwork, subject matter, style, size and where and when the piece sold. The paper also explains the differentiation of the rate of returns by genre of the artwork, its price range, a period of the auction and artist. The result of the sample in this work shows that investing in a portfolio of paintings yield in an average nominal return of 9.3 percent. Moreover, if an investor chooses high priced avant-garde, still life and figure paintings, he/she can achieve higher returns than 9.3 percent.

Chanel et al. (1996) discuss that for the case of heterogeneous assets with infrequent trading, such as painting. They use all sales and not resales only data to construct a price index on hedonic regressions for paintings with the help of non-temporal determinants such as time periods, dimensions, auction houses, etc. Moreover, compared to their estimation which is built on hedonic regression with two extensively used estimators such as the geometric mean and the geometric repeat sales estimator by using bootstrapping techniques. Furthermore, the price is corrected for inflation using. The data set is based on all artists born after 1830 and having had auctions reported 46 artists and 1,900 sales between 1855 and 1970. Their sample focus on Impressionists, Post-impressionists, and their followers. The conclusion of this paper is the price indices of painting should base on regression using all data, not just constructing on resales. The art market is

less efficient than financial markets, because of infrequent trades, and individualized ownership, etc. Infrequent trades create problems to test market efficiency by a random walk process. The hedonic regression method helps to provide a better basis for studying on the predictability of returns and market efficiency with extended data sets.

Candela and Scorcu (1997)'s paper proposes a price index for modern and contemporary paintings based on estimates and auction prices. Their data set represents 60 percent of the whole Italian market and collects both Italian and foreign painters during the period from 1983 to 1994 for a total of 22,371 transactions from 105 auctions. The paper constructs on hedonic regression, using the painter's name, painting dimension, painter's technique, a time dummy, etc. like initial applications to the art market. The time variable is grouped in 24 semiannual periods which is called "sessions" by them with a Fall and a Spring session every year. Per their conclusion is the rate of return on paintings is lower than a return on financial assets and the increase in art prices roughly in line with inflation. Withal, from the result of their study, no relationship emerges between art objects and financial assets. Albeit, the house, and paintings prices are positively correlated in the long run.

Angello (2002) focuses on evidence from auctions in which American paintings market from 1971 to 1996. 25,217 of these artworks made by 91 American artists born before World War II whose works command high prices and are adequately large in number to present with high turnover frequency at an auction (Angello, 2002). The auction transaction data, which studies in this paper, is taken from the Annual Art Sales Index (Hislop, 1971-1996) and only sold works consider with the exclusion of bought-ins. According to data which uses in this study, auction sales annually increase by 7 percent between 1971 and 1996. The deep diving into the particular periods, the paper shows that the growth rate is changing. Especially, annual growth rate of paintings are stable above 10 percent between 1971 and 1989, and it reached the peak point in 1989. Concerning the latest 1970 rate of return, the rate of return was sharply decreased in 1991 and reached a sharp recovery in 1996 like the rate of return in 1988. Concerning his study, the size of the painting, whether it is signed and dated and the artist are alive or not have an effect on the price of the work. The size of the artwork has a positive correlation with the auction price, a larger size has an increasing impact on a paintings' value, on the other hand, the square of size has the negative coefficient. Signature and date on the painting are probably related to higher values, albeit having these features does not guarantee its originality. Paintings made with oil

paint are sold at higher prices, creating a superior quality perception than other paintings. The fact that the artist is alive has an adverse impact on the sales price of his/her work (21 percent). Besides, Angello emphasises on the importance of auction date, such as the first quarter of the year correlates with the lowest price; July and August have the lowest sales volume through the prices on these months are relatively high on the contrary to popular belief (Currier, 1991). Based on January sale price, May, November, and December are the highest price months with an average of 91,88 and 105, respectively.

Mei and Moses (2002) build their annual art index for addressing the question of whether the risk-return nature of paintings compares favorably to traditional financial assets like bonds and stocks. Furthermore, thanks to their larger data set, they test two more propositions commonly advanced by art dealers and economists. Firstly, art investors should buy only masterpieces or buy the most expensive artwork they can afford. The second one, prices realized for same paintings at separate locations at the same time should be the same. They have 4,896 price pairs during the period from 1875 to 2000. With this data set, they construct an annual art index of repeated sales and also break down it for Old Master, American, Impressionist, and Modern paintings for different time periods. The

findings of their paper: First, the art has been a more exciting investment than some fixed-income securities, though it underperforms stocks, on the contrary to some earlier studies. Consequently, a diversified portfolio of artworks may play a somewhat larger role in portfolio diversification. Also, the expensive paintings tend to underperform the art market index. As a conclusion, their results on the performance of masterpieces suggest that investors need to guard themselves against overbidding and should not be obsessive with masterpieces. Finally, art could be suitable for long-term investment only so that the trade costs can be separated over the years.

Worthington and Higgs (2004) examine return, risk and the possibilities for securities diversification between major painting and financial markets from 1976 to 2001. A common literature of an art investment says that the returns on paintings are much lower and the risks much higher than traditional investment markets. They conclude that although investing in art is very risky and has very little return, different art markets have different characteristics. So, depending on the time, some art markets might be superior to others and might be considered as secure as conventional investment markets.

Higgs and Worthington (2005) aim to build an Australian art market index by hedonic price regression equation. Their data base consists on 37,605 sales transaction of artworks of 60 famous Australian artists who are auctioned over the period from March 1973 to June 2003 and lived most of their lifetime in Australia. The source of the data is Australian Art Auction Records (2003). They use the hedonic regression approach, which is much more useful to construct art price index, for the reason that they can use all auction data without considering the repeated sales. The art price index of the paper is based on three explanatory variables. The first one is personal characteristic such as the reputation, quality of the artist, and the living status of the artist if the owner of the artwork is death and all other variables are equal, the sign of the coefficient is supposed to be positive. The second one is the physical characteristics of the artwork. The paper determines the materials used in artwork, and they are acrylic, charcoal, crayon, etching, gouache, mixed media, oil, pastel, pencil and watercolor. The oil is mostly preferred because of it is durable and difficult to work. Also, the dimension of the artwork is an important factor of the physical characteristic. The expected sign of the coefficient for the surface is positive, on the other side surface area squared is negative. The final explanatory variables are auction houses the sale took place in and the year when the artwork is sold in the base period of 1973. According to their

work, Higgs and Worthington found the standard deviations of art price range from 872 US dollar to 171,014 US dollar. They concluded that the prices are not well approximated by the normal distribution, and the distributional characteristics of art prices by auction houses are non-normal, leptokurtic, and positively skewed. It is hard to say the direction of the causal relationship even though the value of solid works varies systematically by auction house according to the results of their analysis.

Kraeussl and Log-her (2008) are analyzing the performance and risk-return characteristics of Russia, China, and India. They construct their art market indices by hedonic regressions based on auction sales prices, and the geometric annual returns are 10 percent for Russia (1985-2008), 5.70 percent for China (1990-2008), and 42.20 percent for India. According to their work, the linkages between art prices in these three emerging market and the economy through co-integration and causality proves that the art markets in these emerging economies share a significant long-term relationship with other financial instruments, on the other hand, short-term relations are largely absent. Their data source is Artnet.com which is one of the most extensive online auction databases, and it is consist of 24,524 of paintings from the Russian art market, 7,172 of them from the Chinese art market, 2,858 of them from the Indian art market, and in total 34,554

paintings during the period 1985 to 2008. The characteristic variables of their hedonic regression model are the auction house, media and material, surface, estimated price, signature, and reputation. The price indices for three emerging economy's art market exhibit strong growth results. The Russian art index increased from 100 in 1985 to 895 in 2008, and its peak point of 985 in 2007. The Chinese art index demonstrates the weakest growth result from 100 in 1990 to its peak point of 271 in 2008. The Indian art index rose from 100 in 2002 to its peak point of 829 in 2008. These art markets have understandably solid performance in comparison with other asset classes.

Atukeren and Seckin (2009) focus on Turkish paintings market with the comparison of the international paintings market prices between 1990 and 2005. Their methodologies to define the dynamics of relationships between these two markets are cointegration test, Granger-causality test, and Capital Asset Pricing Model (CAPM). The data set of this paper is based on 1,030 paintings by 13 Turkish artists and the global paintings market index which is calculated by Artprice, which is a company specializing in price databases and artwork indexes, and employed by hedonic price methodology for calculation of the price index. Furthermore, this article constructs on the first price index of Turkish paintings market which was

also calculated by Sekin and Atukeren (2006). During the same period of the data set, the Istanbul Stock Exchange's return rate is about 10 percent which is excluding dividend payments, and the annualized average of the Turkish paintings market is found to be 6.8 percent in US dollar in their works. Besides, our findings support that their work is in line with the literature of paintings market rate of return in general. By the evidence of this paper, price movements cointegrated in the long term between the Turkish paintings market and the international paintings markets. For the conclusion of the article, the different option to invest on Turkish paintings market for the portfolio of international art investors might be beneficial with the help of higher rate of returns in Turkish paintings market by not forgetting the volatile macroeconomic position of Turkey. Also, they find a significant correlation between the art market returns and stock returns in their 2006 article, on the contrary of the literature. Notwithstanding this correlation, there is a negativity between art market returns and traditional investment returns such as gold, bank deposits, and foreign exchange in terms of developing countries.

Hsieh et al. (2010) work on four questions in their paper. The first one is re-examining whether Asian Contemporary and Modern Art is a good investment or not. Their study shows us that the return on Asian art market

from 2000 to 2009 averaged 8.39 percent, with a standard deviation of 40.7 percent, and it has higher return and volatility concerning an alternative stock market despite western art markets. The second, investing the Asian art market could be beneficial to an investor's portfolio. According to the study, there is a negative correlation between stock markets and Asian Contemporary and Modern Art; therefore, art investment could be beneficial to diversify of investor's portfolio. The third one is about the existence of a "Masterpiece Effect" in the Asian Contemporary and Modern Art market. Contrary to western art markets, "Masterpiece Effect" exists in Asian Contemporary and Modern Art. Fourth, they are testing the major auction house effect on return. As taking a step further of popular literature, they are tracking the art pieces sold and bought. Hence, they had a chance to compare four buy and sale scenarios: buying it from major auction house and selling it major auction house; buying it from major auction house and selling it another auction house; buying it from other auction house and selling it major auction house; buying it from other auction house and selling it other auction house. Selling the art pieces at major auction houses have higher returns than selling it at other auction houses. Major auction house effect is substantially contributed to by art pieces bought at the other auction houses and sold at the major auction houses. However, they are suggesting not to forget that art piece bought at

major auction houses may not always outperform those bought at other auction houses. The construction of this paper is based on repeated-sales of art and estimates and art price index from 2000 to 2009 by semi-annual observation of 24,200 art pieces auctioned from China, Taiwan, and Hong Kong Artron.net.

Higgs' (2012) motivation is examining the global financial crisis effect on the global and the Australian art market in 2008. Further, she is studying the performance of the Australian art market from the period 1986 to 2009 and using the source of Australian Art Sales Digest (2010). On the contrary of previous studies semi-annual or annual art indexes, this paper enhances them by estimating a quarterly hedonic art price index using 64,203 artwork of 71 well-known modern and contemporary Australian artist. This approach helps to apprehend short-term price movements and returns of investing in the Austrailian art market and also construe its performance during the global financial crisis. In the middle of 2008, during the global financial crisis, dramatic downturns are observable in the Australian art market similar to the global art market, though the housing market endured to negative effects. Investing in art market helps to investors to diversify their investments because she finds relatively low correlations with the stock and housing markets.

Hodgson and Seçkin (2012) are examined that econometric time series of the co-integrated relationship between Canadian art market and the international art market in the long-term and their movements' correlation in the short-term. They are testing whether the local market follows the international markets by using the Granger causality and also practicing hedonic index for constructing Canadian art price index which is semi-annual between 1968 and 2008. Furthermore, the source of the international art price index is presented by Mei and Moses (Am Econ Rev 92:1656–1668, 2002). The acrylic and oil paintings, which are sold in the auction houses, are the main characteristic items of their data set. Their variables are the identity of the artist, the height, and the width, the auction house, the date of sale, the medium and support, the genre of the painting, and if available, the performance date of the painting. For the conclusion, the Canadian art market can be considered as driven by Canadian collectors' taste in art; accordingly, there is no clear evidence for price movements relationship between local and international art markets.

Frey and Cueni (2013) are examining that the real reason for investing in the art market and profitability of this investment. Like the other researcher and authors, they are discussing on no substitution to compare prices of

artworks as the same quality and rarely trading frequency. Investment in art on average yields generally a lower rate of return than considering other financial investment instruments. The reason for investing in art is hedging. From their article, the authors compare the returns of stocks, art, government bonds, which are 6.5 percent, 4 percent and between 2 percent and 3 percent, respectively. The risk factor of art investment is about 10 percent higher than corporate bonds. Despite to not overwhelmingly, art has lower risk and higher return than gold, and it is stated by the lower Sharpe ratio of Gold. Alternative investment other than stocks, bonds or cash has typical characteristics such as illiquidity and lack of information. Art investment risks are unique as a result of their physical nature. Guarding against those risks such as destruction by fire, earthquake or war, being stolen, etc. create the needs of insurance and its premium could cost between 0.1 percent and 0.5 percent regarding the artwork's value. Governmental actions such as public interventions, imposing new export restrictions, claiming of a national heritage the artwork which you have, or increasing the property tax or changing the property rights away from the owners towards the artist who created the art object, are the following risks of art investment. A third risk is common with the other investment; however, the art market more strongly affected than financial markets tools. Referred to the paper of Frey and Cueni (2013), the fourth set of risks

are the unpredictable changes in tastes and fashions in the prevalent art world. A final one is behavioral anomalies of the owner of the artwork. To get to the conclusion point, should we invest or not invest in art? Forecasting the return on any financial market is almost impossible, and art market is also inside of this assumption. The contradiction of this point is the psychic return is much better predictable if you are already an art collector, and this is an important origin of engaging in art investment.

Dimson and Spaenjers (2014)'s paper starts with an average annual rate of art, stamps, and musical instruments (violins), 6.4 percent - 6.9 percent in nominal terms and 2.4 percent - 2.8 percent in real terms from 1900 to 2012. These emotional assets can vary substantially across the different types of them in long-term returns and short-term trends. In addition to financial returns of emotional assets, they can provide the non-financial yield in contravention of the large costs and various pitfalls. The results of their construction for an art investment starting with identical items from purchase and sale prices, and chain-link between their resources. The annualized nominal return in British Pounds (GBP) for the period between 1900 and 2012 is equal to 6.4 percent, while the geometric average real return equals 2.4 percent (Dimson and Spaenjers, 2014). Macroeconomic adverse event periods negatively affect art prices. During World War I, the

Great Depression, the 1973 oil crisis, the early 1990's recession and the 2008 financial crisis can be an example of the negative shocks on wealth or top income levels and depressing high-end art prices. On the contrary, we can discern strong price recognitions in the certain periods, such as the 1960s and 1970s, end of the 1980s, and the mid-2000s. They also compare the geometric average returns between art, stamp, and instruments, and deduce similarity in the long-term returns on the contrast of short-term. Over the period of 1900 and 2012, art, stamps, and violins have realized yearly average real returns by between 2.4 percent and 2.8 percent, in response to this, equities have realized 5.2 percent average real return in a year. Nevertheless, after examining very long-term returns of bonds and bills recorded average real returns of 1.5 and 0.9 percent, respectively, and they concluded that art investment has higher yields than these investment instruments.Like the other papers, Dimson and Spaenjers (2014) mentioned about the issue of illiquidity and hidden transaction costs. Different from the others, they also emphasize on forced sale adverse effects on prices, because the time-consuming procedure of auction circuit sometimes make the inconvenience of selling process in a short time for owners of investee art object.

Kraussl (2014) also investigate the risk and return characteristics of art investment in emerging economies. This time, the main focus is artists from the Middle East and Northern Africa countries over the period from 2000 to 2012 and consideration of paintings sold at auctions. It comprises the following countries: Saudi Arabia, Sudan, Syria, Algeria, Tunisia, Bahrain, Djibouti, Egypt, Mauritania, Morocco, Iran, Iraq, Jordan, Oman, Qatar, Lebanon, Libya, United Arab Emirates, Kuwait, Yemen, and Turkey. The variables of the individual painting are a title, surface, sale date, sales price converted to US dollar, a name of the auction house, whether the artwork is signed or not, medium and material used. Their sample consists of 59 different auction houses' sales record of 3,544 paintings which belong to 663 individual artists from specified countries. Turkish painters had the maximum number of sales with 814 paintings during the period under review. On the other hand, the Egyptians and the Iranians paintings are both represents a larger percentage of sales by US dollar turnover of 476 and 650 sales respectively. Thereby, the average Egyptian and Iranian painting is more expensive than the Turkish one. In their data set, the most expensive painting, which is auctioned by Sotheby's London, is an oil on canvas painted by Osman Hamdi Bey, who is the most famous Turkish painter in history, and titled "A Lady of Constantinople," for over 5.5 million US dollar. Majority of their sample paintings are

consist of oil on canvas which is more than 46 percent (1,644 pieces). According to their observation, the risk return of trade-off and the financial characteristics have a solid geometric annual return of 13.9 percent. The art index of the selected countries outperforms against to global equity markets, besides performing very strong in comparison with other alternative assets such as commodities, private equities, and real estate.

Renneboog and Spaenjers (2014) examine on geographical segmentation and its results on price configuration return to the global art auction market. The geography of the art market has two different though mutually reinforcing way. Legal and practical barriers interfere international transactions; also, art market is noticeably segmented as a result of international diversification in the relative demand for various types of art, so we can assume that art is a diversified asset. This approach also supports their previous study (Renneborg and Spaenjert (2011) which shows us that new riches of emerging markets such as China, India, and Russia, prefer to repurchase their heritage. In brief, artwork has highest requirements in the home country of its creator and collectors mostly prefer the artworks of their compatriots. They examine the international variety of the artworks sold at auction houses and the returns in international art markets since the beginning of the 1970s. Moreover, they examine to which art prices

generated in various auction markets move together. In addition to them, they evaluate the contingent importance of global and local economic principals in defining the price of artworks. The database which is constructed by them, consist of over one million sales of paintings and artworks on paper at worldwide auctions during the period from 1970 to 2007. In general, they focus on the 13 developed countries such as United Kingdom, United States, France, Germany, Italy, Netherlands, Switzerland, Sweden, Australia, Denmark, Austria, Belgium, Canada with respectively, 333,973, 216,896, 162,996, 63,621, 49,653, 39,651, 38,247, 31,357, 29,656, 22,676, 15,601, 15,007, 14,685 observations. The data set exhibits substantial segmentation regarding the type of artworks sold. According to their art price indexes for all countries in the paper, the average return on art investment is under the return on equities over the same period, and most of them are even below the average GDP growth rate. The wealthy households' demand for luxury consumption commonly determines the performance of art as an investment. As opposed to popular belief, they do not have evidence that the globalization of the world economy has integration effect on the art markets, and so on it supports the importance of the persistent international differences in demand. They use hedonic regressions to estimate an annually universal price index for art, in real US dollar terms, for the countries that consider, and their index's

characteristics included are the same as in their previous work which is Renneboog and Spaenjers (2013). The hedonic regressions help them to use all available sales information such as a wide range of value defining year effects and characteristics. By their results, price levels are correlated with a topic, the timing, attribution, medium, size, artist's fame, signs of authenticity, and location of the sale. Besides, the data set that is essential to this study does not have the information of multiple transactions of the same artwork. They find a strong difference in investment performance beyond 13 developed countries in their paper. The average real US dollar returns on art investment, over the three to four decades leading up to 2007, range from –0.90 percent for Belgium to 4.60 percent for the United Kingdom, and it is 3.07 percent for the United States. There is no finding of the correlation between return and risk. The highest standard deviations are recorded 21.15 percent for Australia and 20.18 percent for Sweden, whereas the lowest observed volatility is in Germany by 13.12 percent. The standard deviation for the United States which is 14.31 percent does not surprise to them. Except for the correlation between Australia and Switzerland, all coefficients are significantly positive at the 0.05 level. The average of the cross-country correlation coefficients is 0.59. While comparing global and local fundamentals, they focus on GDP growth rates and equity returns. Their regression results that the sensitivity of art prices

to income growth rate is higher than one, and this shows that variation in worldwide economic growth affects the price of art. One of their hypothesis is about the price level of artwork, by the most reputable artists who are often appreciated universally, should be slightly affected by local factors. Their results show that variations in global trends have no impact on art prices of the famous and reputable artists, and close connection between the character of artworks and sold country. They find substantial international variation in average returns to art investments during the period from 1971 and 2007.

Dorota and Krysztof (2015)'s paper aims to build hedonic art price indexes for the Polish paintings market by made up of 17 Polish artists whose paintings were most often traded at auctions in Poland between 2007 and 2013. They take a step further of Witkowska's (2014) study on the hedonic art price indexes for Polish paintings. For estimating returns of the paintings, they employ data on 1710 artworks and practice the hedonic regression methodology with exercising direct and indirect approaches. They are mentioning about a development of the global art market which was worth 47.4 million EUR (total sales of art and antiques) in 2013. Total trading value of Polish art market is 32.9 million USD in 2009, 2.4 million USD in 2010, 23 million USD in 2011 and 12.3 million in 2012. The five

major Polish artists who are Tamara de Lempicka, Henryk Siemiradzki, Roman Opalka, Max Weber, and Piotr Uklanski, are dominating the market with more than 1 million USD. They are classifying the quality of artwork with signature, technique, and surface of the painting. In their equation, visible signature's dummy variable equals 1 to represent the quality. On account of describing the physical characteristics of a painting, surface (cm2) is commonly-used variable, and it has a positive effect, on the other hand, in some models, the large works' surface has a negative influence, and we can consider it as a curve. Year and price relation represent conditions of the transaction. As a result of their study, the Warsaw Stock Exchange Index WIG has small gain than the calculation of all hedonic indexes, negative correlation between the equity market and the Polish paintings market. The strength of the correlation between the stock market index and all estimated art indexes ranged from -0.541 to -0.802 (Dorota and Krzysztof, 2015).

Potocki and Rogozinska (2015) aim to find an answer to the following question: is the Polish art market mature enough to look at art investment as a significant component of portfolio diversification? To reach the answer of this argument, they studied on 28,951 auction records which were published by Art&Business magazine, during the period 1991-2010.

According to their findings, art investment is an alternative to the traditional financial instruments, and the Polish art market can be seen as a pure collector's market because there is no detrimental effect of the financial crisis from the period 2007-2008. Besides these, it is important to emphasize that the Polish art market is not mature in the depth and stability range and still comparatively limited in depth from other mature art markets.

Kräussl et al. (2016) are searching for bubbles in the art market by using a right-tailed unit root test with delivering repeated regression test in the time series of six different art market between 1970 and 2014. The major six segments in the paper are "Old Masters", 19th Century European", "Latin American", "American", "Post-war and Contemporary", and "Impressionist and Modern risk-return Their sample is built from the Blouin Art Sales Index, which is one of the most popular and biggest online database. In the context of the art market, the main questions are the recent dramatic increase in art prices concern the entire art market and the determination of the intrinsic value of the artwork. The empirical findings in this paper suggest that there is solid evidence of a speculative bubble which has started in late 2010, and it is still in the mania phase of its formation for the "Old Masters", "American", "Post-war and

Contemporary", and "Impressionist and Modern" art markets and these are most likely to develop bubble-type behaviors.

Shi et al. (2017) examine investment performance and price determinants for paintings from mainland China by using hedonic regression analysis for building a semi-annual price index which consists a data set from over 190,000 auction transactions during the period from 2000 to 2015. Their Chinese art market data is from Artron.net which is primary art auction database of Chinese domestic auction houses from 2000. According to their paper, the Chinese art market has its unique atmosphere: gallery sales account for a small part of the entire Chinese art market; state-backed auction houses dominate the art market; most of the transactions involve traditional Chinese paintings which have significant differences with western art; some artists have created a considerable body of work; and so on. Consequently, the Chinese art market has many unknown issues to research. As a result of their study, the average annual appraisal in a value of Chinese art was 8.42% in real US dollar. By comparison of global artwork, American artwork, and traditional financial assets, the Chinese art market has low correlation with other assets and better risk and return profile. On the contrary of developed countries' art markets, The Chinese art return is greater than that of real estate, gold, bonds, stocks. Additively,

the low correlation with other assets shows us the possibility of improving the efficiency of an investment portfolio. Finally, regarding the masterpiece effect, the outcome is that highly priced Chinese art does not underperform the market.

3. DATA

The data consists of 32,391 sales transactions in Turkey over the period 1990–2016 including artworks of 413 artists. This data is manually obtained from Lebriz Auction Database. The selection of artists to be included in the index is a difficult and subjective task (Higgs, 2012). We collected the data of all artists with more than 20 auctions in the database in the given period by also controlling for non-paintings artwork and removing them from the dataset.

Our dataset is unique when compared to the previous studies examining the art market in Turkey. For example, Seçkin and Atukeren (2006)'s dataset captures only 1030 sales of 13 artists for the period from 1989 to 2006Q1, while Seçkin and Atukeren (2009) use a dataset of 4431 paintings of 74 Turkish artists over the period 1990–2005. Our dataset includes 8,968 sale records for the same period (1990–2005), which is more than double of these previous studies. Moreover, The dissertation updates the art

market data till 2016. This is only an important aspect from the period of 2005–2016 is a crucial and interesting period as Turkey not only experienced record high growth rates, but also witnessed political stability. The art market has grown steadily over the period under concern. However, stability leaves to an uncertainty, and since 2011 Turkey and its region have experienced a political instability and uncertainty, known as the "Arab Spring". These issues have also negatively affected the returns, sales, and values in the Turkish Art Market.

Table 1 reports the numbers and values of sales over the period 1990–2016. According to Table 1, there is a dramatic increase in the number of sales of artworks from 1990 to 2011. After 2011, the number of sales decreased from 3,111 to 1,316 in 2016. Our dataset includes the record high sales of $3.6M in 2016 and $3.5M in 2014 while also having sales at a value of around $30. The mean hammer price is $10,668 with a standard deviation of $46,543. The most expensive groups of paintings are "acrylic" and "oil" with a mean of $13,750 and $11,697, respectively. In terms of the material, "canvas" has the highest sales price with a mean of $14,335.

Table 1. Numbers and Values of the Sales by Years (1990–2016)

			Mean		Total (in Thousands)	
Year	Sales	Percent	TRY	USD	TRY	USD
1990	96	0.3	42.31354	14542.59	4.0621	1396.089
1991	163	0.5	18.65583	4294.429	3.0409	699.992
1992	214	0.66	25.02804	4078.612	5.356	872.823
1993	295	0.91	46.62881	3920.003	13.7555	1156.401
1994	203	0.63	247.9729	7049.202	50.3385	1430.988
1995	370	1.14	200.5432	4237.308	74.201	1567.804
1996	239	0.74	806.4812	9342.059	192.749	2232.752
1997	47	0.15	727.8723	6449.617	34.21	303.132
1998	107	0.33	942.0093	3613.458	100.795	386.64
1999	122	0.38	2507.582	5125.451	305.925	625.305
2000	284	0.88	7950.88	12579.19	2258.05	3572.489
2001	374	1.15	5387.233	4795.198	2014.825	1793.404
2002	1,205	3.72	6750.183	4595.269	8133.97	5537.299
2003	2,228	6.88	6174.064	4056.185	13800	9037.18
2004	1,510	4.66	12153.83	8534.03	18400	12900
2005	1,511	4.66	11429.56	8523.626	17300	12900
2006	2,023	6.25	11039.42	7799.824	22300	15800
2007	2,654	8.19	14022.38	11066.98	37200	29400
2008	2,591	8.01	15299.49	11406.51	39600	29600
2009	2,152	6.64	23120.96	15181.73	49800	32700
2010	3,111	9.59	24869.22	16466.07	77400	51200
2011	2,292	7.08	29763.5	17985.8	68200	41200
2012	2,089	6.45	22940.84	12822.65	47900	26800
2013	1,869	5.77	24801.01	13227.73	46400	24700
2014	1,714	5.29	22233.11	10155.08	38100	17400
2015	1,612	4.98	18457.11	6880.669	29800	11100
2016	1,316	4.06	21698.75	7105.138	28600	9350.362
Total	32,391	100	16911.9	10668.41	548000	346000

Turkish art market moves in line with the international art auction calendar as there is a sharp decrease in the number of auctions in summer periods (Seçkin and Atukeren, 2009). As also noted by Seçkin and Atukeren (2009), the sales are highly concentrated in March, April, May, and November.

4. METHODOLOGY

As artworks are unique and extremely heterogeneous, it is not possible to find a substitute to compare prices of artworks of the same quality. While it is possible to calculate the true value of a stock which equals to the discounted present value of future earnings, the true value of art object cannot be computed as it does not pay a dividend that can be discounted (Baumol, 1986). However, the literature uses three different methods to measure the value of an art piece: naïve art price indices (Candela and Scorcu, 1997), the repeat sales method (Anderson, 1974; Baumol, 1986; Mei and Moses, 2002; Pesando, 1993), and hedonic regressions (Buelens and Ginsburgh, 1993; Renneboog and Van Houtte, 2002) to construct the art price index to calculate the returns on art. The naïve price indices implement the average price method and representative painting method. As the quality of the artwork changes over time, this index might be biased over time. Moreover, high-price items sold in a year will significantly affect the index values. Consequently, two approaches have been used to cope with the problem of changing quality, i.e. the repeat sales regressions and the hedonic price indices (Kraeussl and Wiehenkamp, 2012). However, the repeat-sales method takes only into account the items that have been sold at least twice during the given period. This method uses the

purchase and the sale price pairs calculate the average returns. However, art objects trade very infrequently and mostly identification of resales is a difficult task. Therefore, using the repeat-sales method leads to a relatively small number of observations. Moreover, items which trade twice may in general not be representative of the overall population of artworks (Renneboog and Spaenjers, 2013). Chanel (1995) also shows that the hedonic regression estimators are more precise than repeat-sales estimators. Basically, due to the problems of identification for the repeat sales and to have a representative dataset of the Turkish art market, we use the hedonic regression methodology. While the repeat sales regressions include art objects traded several times, the hedonic regression method takes into account all auctions, and this leading to a bigger and more representative dataset. Then a regression is performed to determine the hedonistic variables affecting the price of artwork (such as, artist, date of origin, medium, signature, and size) with the time dummies (Frey and Cueni, 2013).

The hedonic regression method uses quality characteristic variables along with the time dummy variables to build the art market index. Therefore, the price appreciation of a 'standard' paint is stripped of its physical characteristics (Renneboog and Van Houtte, 2002). The implicit (or

shadow) prices for the artistic characteristics for all sales are estimated and deducted from the auction prices, leaving only the effect of time and random error. At this stage, the auction sales price is the dependent variable converted into its natural logarithm. Following Agnello and Pierce (1996), Buelens and Ginsburgh (1993), Chanel (1995), De la Barre et al. (1994), and Renneboog and Van Houtte (2002), we use the following the hedonic regression to construct the art price indices:

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

where p_{kt} is the price of the painting (both in the Turkish Lira and the USD) k at time t, X_{mkt} represents the value of characteristic m of item k at time t while D_{kt} is a dummy variable that takes the value one if the painting k is sold in period t (and zero otherwise). β_m is the coefficient value for the quality characteristic. The antilog of the time dummy coefficients (γ_t) will be used to construct the art price index. The value of the hedonic index in year t is also calculated as follows:

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

The omitted year is 1990 and γ_0 equals to 0 which makes $\Pi_0 = 100$. The return in year t is calculated, as such:

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

As the paintings are heterogeneous, the hedonic regression is used to correct for the characteristics which make the object unique (Kraeussl and

Logher, 2010). Hedonic variables are selected based on the previous literature and the data availability. In line with the previous papers, in terms of physical characteristics of the artwork, we consider two groups. The first group of physical characteristics is dummy variables for the medium of the artwork: acrylic, gouache, mixed technique, oil, watercolor, and other. The largest number of the medium is oil with 70.54%, followed by acrylic, other, and watercolor. We also include the material dummy to the estimates: the canvas, cardboard, carton, hardboard, other, paper, and plyboard. The canvas has a share of 58.33% in the total sales. Both the other and the plyboard are the omitted variables in the regression. The second group of physical characteristics is the dimensions of the artwork as represented by the surface area in square meters (m^2) and surface area squared. While a positive relationship between the artwork price and area, a negative relationship is documented in the surface area squared due to diminishing returns to size (Seçkin and Atukeren, 2009).

Once the artist dies, the artist is no longer able to create artworks. It is assumed that the value of the artist's paintings will increase after his/her death. However, if the deceased artist is not famous, his or her death can also cause a decrease in the value of her paintings as she is no longer able to promote her work (Kräussl et al., 2016). The gender dummy is also

introduced to see if the artwork of female artist is different than the males. Gender dummy is equal to 1 if the artist is a female. As usual, the artist dummies capturing each artist's uniqueness are also included.

After constructing the hedonic price index for the Turkish art market, we have implemented various comprehensive analyses to understand the dynamics of the TAM. The first empirical analysis is based on the causality test by Hacker and Hatemi–J (2006) and we aim to analyze the causal relationships among the returns of the Artprice Global, the BIST, the S&P500, and our TAM indexes. The Artprice Global captures the global price of art and other art pieces can be considered as a "rival goods" and domestic (the BIST) and global (the S&P500) stock markets can be considered as an alternative benchmark investment of the Turkish Art. Therefore, we focus on the related variables in the causality analysis. Before the causality test, we use the unit root test of Narayan and Popp (2010) that considers two structural breaks in the series to confirm the stationarity of the series. The structural-breaks could also be an important phenomenon in the TAM since our dataset includes the Turkish financial crises in 2001 and the global financial crisis of 2008–9. Finally, The dissertation aims to see the effects of political instability on the TAM and the regression results indicate that a dummy variable for the Arab Spring

is negatively related to the return in the TAM. Furthermore, the results state that the political risk in Turkey has also negatively affected the TAM. The main variable of interest in this analysis is the overall political risk of the PRS Group.

5. EMPIRICAL FINDINGS

5.1. Hedonic Price Index

Table 2 presents the parameter estimation of the hedonic regression for Eq. (1), which is estimated using the ordinary least squares (OLS). The dependent variables are the natural log of the price in the Turkish Lira (TRY) and the USD. While "Area" has a positive effect on the price of the artwork, "Area^2" has a negative effect, which is in line with the previous literature. This shows that a larger size artwork has a higher price both in terms of the TRY and the USD. However, this increase in the price is not a linear function of the size, and it reflects a nonlinear relationship (Seçkin and Atukeren, 2009). Our finding shows that the Turkish art prices firstly increase with the size, then decrease as the paintings become too large and difficult to a house (Higgs and Worthington, 2005). The dead of an artist has a positive effect on the price of the artwork. After the death of an artist, the price of the artwork rises by 25.76% and 26.48% in the TRY and the

USD, respectively. Gender has a negative effect on the art price, implying that the paintings of female artists are priced 84% less than the male artists. In addition, oil and acrylic paintings are more valuable artworks than other kinds of artworks. Compared to other groups, all acrylic, gouache, mixed technique, oil paint, and watercolor are more expensive. The canvas is the most expensive artwork material. Carton and paper are less valuable than the plyboard.

Based on the year coefficients, we construct the art price index both in the TRY and the USD and the results are presented in Figure 1A and 1B. The index value equals to 100 in 1990. We could not set both index values in the same figure due to the very high inflation rates of Turkey and this leads to the non-comparable index values in the TRY. According to Figure 1A and 1B, the TAM both in terms of the TRY and the USD experienced an increase till 2010 and after 2010, they decreased dramatically. TAM in the USD was 288.6 in 2011 and declined to 123.8 in 2016, interestingly. In the next section, we illustrate that this decline is due to the political risk in Turkey.

Table 2. Results of the Hedonic Regression for the TAM (1990–2016)

Regressors	TRY	USD
Area	11.6665*	11.72662*
	(6.1159)	(6.14438)
Area2	–5.4945*	–5.52396*
	(3.0579)	(3.07217)
Dead	0.22917***	0.23492***
	(0.02820)	(0.02833)
Gender	–1.86383***	–1.83234***
	(0.18182)	(0.18267)
Acrylic	1.10903***	1.11282***
	(0.02654)	(0.02667)
Gouache	0.92984***	0.943048***
	(0.03549)	(0.03566)
Mixed Technique	0.95809***	0.96244***
	(0.02141)	(0.02151)
Oil Paint	1.107803***	1.113451***
	(0.0209)	(0. 0209)
Water Color	0.76166***	0.765133***
	(0.02598)	(0.02610)
Canvas	0.10861***	0.10949***
	(0.0236)	(0.02373)
Cardboard	0.038217	0.03723
	(0.0291)	(0.02925)
Carton	–0.22213***	–0.21819***
	(0.0258)	(0.02588)
Hardboard	0.02348	0.01915
	(0.02568)	(0.0258)
Other	–0.0635**	–0.06441**
	(.027553)	(0.02768)
Paper	–0.30221***	–0.29691***
	(0.02753)	(0.02766)
Constant	–5.5664***	0.2619**
	(0.1141)	(0.1146)
Year dummies	Yes	Yes
Artist dummies	Yes	Yes
F(452,31938)	544.91	336.19
Probability > F	0.000	0.000
Number of Observations	32,391	32,391
R-squared	0.89	0.83

Notes: The table presents the baseline hedonic regression results and Eq. (1) is performed using the OLS. The dependent variable is the natural log of the price in the TRY and the USD. The other and the plyboard are the omitted variables in the regression. ***, ** and * indicate the 1%, 5%, and 10% significance levels, respectively.

Figure 1A. Hedonic Price Index (TRY)

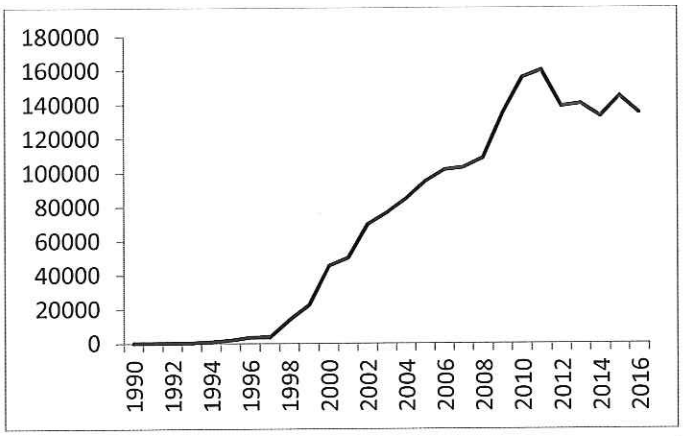


Figure 1B. Hedonic Price Index (USD)

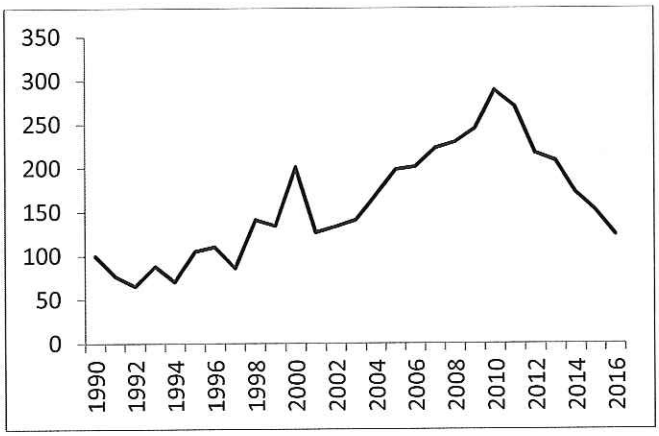
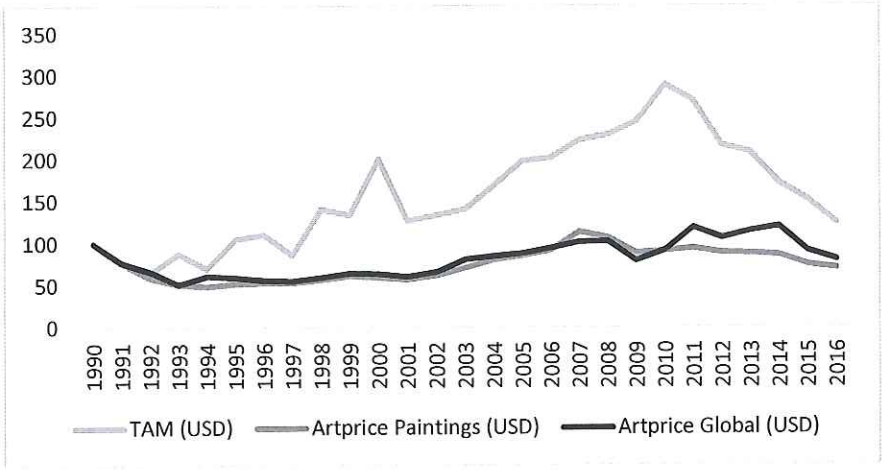


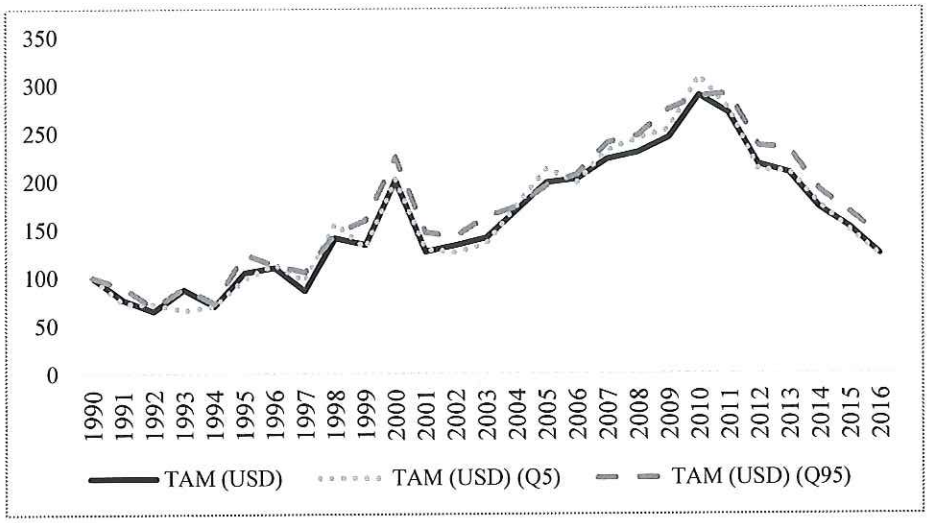
Figure 2 presents the Turkish Art Market Index (TAM), Art Price Paintings Index (API) and Art Price Global Index (AGI). It is observed that the TAM has been more volatile compared to the global art price indexes. This finding is in line with the previous literature of the developing art markets.

Figure 2. Turkish Art Market Price Index, Artprice Paintings Index, Artprice Global Index (1990–2016)



The dissertation also estimates the price trends for the percentiles 0.95 and 0.05 to understand whether the behavior of higher price brackets differs from the lower price brackets. The return of Q05 is slightly less than Q95 and Q50. The return on the higher price brackets (Q95) is 3.58%, while the return for Q05 is 3.33%. From 1990 to 2016, prices increased more in the higher price brackets. This is in line with the findings of Renneboog and Spaenjers (2013), who observe that the outperformance of the higher quantile is associated with the strong price rises in the times of increasing demand for art. However, Mei and Moses (2002) document the opposite finding showing the underperformance of masterpieces.

Figure 3. Results of the Quantile Regressions (1990–2016)



5.2. Comparison of Investment Performance and Correlation with Other Asset Classes

In this section, we compare the performance of art investment with other financial assets. Table 3 shows the average yearly returns and volatilities calculated over the periods 1990–2016. During the period of 1990–2016, the Turkish art market price index underperforms the stock market. The return of the TAM in the USD is 3.49% (with an S.D. of 24.79%), while the Borsa Istanbul (BISTUSD) increased by 8.55% (with an S.D. of 37.49%) on the average. Our findings for Turkey is in line with the most of literature showing that the returns on art is lower than the stock exchange (see Appendix 1). The return of TAM in the USD is less than all other

assets except the 3-month T-bills return. However, the TAM has outperformed both the Artprice Paintings Index and the Artprice Global Index. The S&P 500 index appreciated by 11.32%, while the Art Price Paintings index decreased by –0.76% over the period under concern.

Table 3. Comparison of the Investment Performance (1990–2016, %)

Variables	Mean	Standard Deviation
S&P 500	11.32	17.59
3-month T–bills	2.66	2.14
10-year T. Bond Return	6.51	9.29
Turkish Paintings Market (TRY) (Nominal)	42.19	66.38
Turkish Paintings Market (TRY) (Real)	3.61	49.48
Turkish Paintings Market (USD)	3.49	24.79
Turkish Paintings Market (TRY) (Nominal) (1990–2010)	55.47	70.55
Turkish Paintings Market (USD) (1990–2010)	8.42	26.19
Turkish Paintings Market (TRY) (Nominal) (2011–2016)	–2.08	7.85
Turkish Paintings Market (USD) (2011–2016)	–12.95	6.56
Artprice Paintings Index	–0.76	11.29
Artprice Global Index	0.15	14.26
Gold	5.48	13.65
BIST (USD)	8.55	37.49
BIST (TRY)	43.58	58.94
BIST (USD) 1990–2010	13.04	41.46
BIST (USD) 2011–2016	–6.44	11.91

We also divide the sample into two periods as 1990–2010 and 2011–2016 as we observe a decline in 2010. The decrease after 2010 is observed both in the art and the stock market, which is due to the increasing political risk and decreasing value of the TRY against the USD. The return in 1990–

2010 period for the TAM in the USD and the BIST in the USD is 8.42% and 13.04%, respectively. Furthermore, they both the experienced negative returns 2011–2016 period.

In addition, Table 4 shows the correlations between the asset categories. The correlation between the Turkish art market index and Borsa Istanbul is 0.56. The relatively higher positive correlation is in line with Renneboog and Spaenjers (2013) implying that diversifying across these markets will not allow investors to reduce portfolio risk. In contrast, we find a little co-movement between the TAM index and other financial assets.

Table 4. Correlations of the Asset Returns

	S&P 500	3–month T–bills	10–year T–bond Return	Turkish Paintings Market (USD)	Artprice Paintings Index	Artprice Global Index	Gold	BIST (USD)
S&P 500	1.00							
3–month T–bills	0.15	1.00						
10–year T–bond Return	–0.27	0.28	1.00					
Turkish Paintings Market (USD)	0.11	0.27	0.39	1.0				
Artprice Paintings Index	0.03	0.10	0.03	0.34	1.0			
Artprice Global Index	–0.09	–0.09	–0.01	0.11	0.72	1.0		
Gold	–0.38	–0.24	0.11	0.10	0.31	0.37	1.00	
BIST (USD)	0.18	0.11	0.11	0.56	0.43	0.18	0.17	1.00

It is noteworthy to indicate that while the return on the art market is less than the stock market, our analysis on the return comparison does not consider the transaction and other costs of art investment. Transaction costs on financial markets are around 1 percent of the price in general; however, the commission fee for both seller and buyer is around 10–25% of the hammer price in the art market auctions (Frey and Cueni, 2013). A high commission cost forces the investor to keep the artwork for a long-period, which causes a liquidity problem. Indeed, the art investments are also undivided and not liquid in comparison to other financial assets (Witkowska and Kompa, 2015). While the financial assets can be easily sold and bought in the market, artworks cannot be sold quickly without bearing the commission and discount. In addition to the transaction costs, there are expenses related appraisal, insurance, and storage costs of the artwork (Dimson and Spaenjers, 2014). The owner of the artwork also faces the risks of damage or theft due to fire, revolutions, terrorist attacks, wars, etc. In order to protect against those risks, the artwork may be insured at a substantial cost around 0.1% and 0.5% of the artwork's value (Frey and Cueni, 2013).

On the other hand, a buyer of the artwork cannot be totally sure whether the object is original, repainted or damaged which will certainly affect its

future value. Moreover, there is the risk of unforeseen public interventions. Governments may expropriate an artwork by claiming that it is a part of "national heritage." When there is an increase in the sales or property taxes, the investors in the art market might move to the classic financial investments (Frey and Cueni, 2013; Frey and Pommerehne, 1989). The changes in genres and tastes impose a risk on the future value of the artwork. There is also a change in the wealth distribution, which after the prices of the artwork. There are new emerging economies with a faster growth rate and increasing GDP per capita. As a result of this rapid growth and depressing growth rates in developed economies, the role of emerging economies in the art market has been rising. China has a currently developing art market with a share of 18%. This changing wealth patterns and the corresponding changes in demand may have an effect on the relative art prices (Dimson and Spaenjers, 2014)

5.3. Results of the Causality Test

Atukeren and Seçkin (2009) explore the relationships between the Turkish paintings price index and international art market index over the period 1990–2005 by using cointegration and Granger causality tests. It is shown that prices in the Turkish paintings market move in line with the global art

market in the long term, implying that the Turkish and global art markets are cointegrated. In line with the expectations, the direction of causality is unilaterally implied that international paintings market causes the Turkish paintings market. Worthington and Higgs (2003) also examine the long-term and the short-term relationships among leading major painting markets (such as, the Modern European, the Modern U.S. paintings, the Contemporary Masters) and the global equity market for the period from 1976 to 2001. The Granger non-causality tests within an error correction model (ECM) are used to measure the causal relationships in the short-term, while the Wald test statistics in a level VAR approach are used to measure the long-run causality. It is documented that art markets are highly integrated. Moreover, there are significant causal linkages among the art markets as well as between the equity market and art markets. Hodgson and Seçkin (2012) firstly develop the Canadian semi-annual art price index over the period 1968–2008 and then analyze the price dynamics between the Canadian and the international art markets. Their findings show that the Canadian art prices move independently of the prices in the international art markets in the long run, which is the opposite of "the globalization of tastes" argument of Goetzmann (1993). The price co-movements obtained by three groups of painters (great masters, other painters, and the U.S. painters) in the U.S. (New York), the UK (London),

and France (Paris and Versailles) between 1962 and 1991 are examined by Ginsburgh and Jeanfils (1995). Using a VAR (vector autoregressive) model, it is found that those markets move together. Moreover, their results show that there is no long-run relation between the art- and the stock markets in New York, London, and Paris; however, the stock market returns affect the art prices in the short-run.

In line with these papers in the previous literature, we examine the causal relationships among both domestic and global art and stock markets. Before the causality analysis, we run the unit root test of Narayan and Popp (2010) and report the related results in Table 5. According to the results of the unit root test in Table 5, while the BIST is stationary; the Artprice Global index, the S&P500, and the TAM follow a unit root process. Since the first differences of all series are stationary, we consider the first-differenced series in the causality analysis. The results of the causality test of Hacker and Hatemi–J (2006) in Table 6.

Table 5. Results of the Unit Root Test of Narayan and Popp (2010)

Variables	ADF	Lag	Breaks	ADF	Lag	Breaks
BIST (Nominal USD, 1990=100)	–5.077**	3	2006, 2008	–5.980**	0	1999, 2008
TAM (Nominal USD, 1990=100)	–1.844	1	2003, 2010	–7.758***	0	2000, 2010
S&P500 (Nominal USD, 1990=100)	–3.623	0	1999, 2006	–6.290***	1	1999, 2006
Artprice Global Index (Nominal USD, 1990=100)	3.161	1	2002, 2010	–9.722***	0	2001, 2005

Notes: The results both include i) the break on the level, (left column) ii) the break in the level and the trend terms (right column). Null hypothesis: the series has a unit root. The optimal number of lags is selected by the Akaike information criterion (AIC). The maximum number of lags is 3. The trimmer rate is defined as 0.10. CV: Critical Values. The CVs for the break on the level: 1%:–5.259, 5%:–4.514, 10%:–4.143. The CVs for the break on the level and the trend terms: 1%:–5.949, 5%:–5.181, 10%:–4.789 ***, **, and * indicate the rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively.

The results in Table 6 indicate that there is a bidirectional causality (at the 5% significance level) (called as the feedback effects) between the Turkish art market and BIST indexes. Furthermore, there is a significant causality (at the 1% significance level) that runs from the global art market price index to the domestic (Turkish) art market price. Interestingly, there is a weak causal relationship (at the 10% significance level) that runs from the S&P500 index to the Artprice Global index.

Table 6. Results of the Causality Test of Hacker and Hatemi–J (2006)

Non–Causality Test	Chi–square Statistic	Probability
BIST does not cause TAM	2.345**	(0.0213)
TAM does not cause BIST	2.374**	(0.0199)
BIST does not cause S&P500	1.157	(0.2503)
S&P500 does not cause BIST	0.532	(0.5961)
BIST does not cause Artprice Global Index	1.398	(0.1669)
Artprice Global Index does not cause BIST	0.950	(0.3447)
TAM does not cause S&P500	1.157	(0.2503)
S&P500 does not cause TAM	0.003	(0.9973)
TAM does not cause Artprice Global Index	1.537	(0.1279)
Artprice Global Index does not cause TAM	3.408***	(0.0010)
S&P500 does not cause Artprice Global Index	1.678*	(0.0969)
Artprice Global Index does not cause S&P500	0.864	(0.3901)

Notes: ***, **, and * denote the rejection of the null hypothesis at the 1%, 5%, and 10% significance levels. The lag length is selected as one. The p–values are in the parentheses.

5.4. Impacts of Political Risk and Arab Spring on the Turkish Art Market

We further aim to analyze the decline of returns in the TAM since 2011. In line with Assaf (2017), we test the validity of a hypothesis whether political risks in Turkey and Arab Springs negatively affect the return of the TAM. For this purpose, we estimate a regression model and provide the related results in Table 8.

Table 7. Results for the Impact of the Political Risk in Turkey and the Arab Spring on the Turkish Art Market (1990–2016)

	Model I	Model II	Model III	Model IV	Model V
BIST	0.48275***	0.56333***	0.64618***	0.6530***	
	(0.001)	(0.000)	(0.000)	(0.000)	
$BIST_{t-1}$					0.38444***
					(0.024)
Artprice Paintings	0.26819				
	(0.345)				
Artprice $Paintings_{t-1}$					0.24884
					(0.549)
Political Risk	0.79798***	0.82738***	0.66821***		
	(0.034)	(0.012)	(0.068)		
Political $Risk_{t-1}$					1.2575***
					(0.032)
Arab Spring			–0.22099***	–.27112***	
			(0.046)	(0.012)	
Constant	–1.6627***	–1.011**	–0.70528	–1.9813***	–2.9644***
	(0.319)	(0.414)	(0.611)	(0.000)	(0.160)
R^2	0.7372	0.7262	0.7569	0.7277	0.569
Number of Observation	27	27	27	27	26

Notes: The dependent variable is the Turkish Art Market Index. The BIST: Borsa Istanbul Stock Exchange; Political Risk: political risk of the PRS Group (In the dataset of the PRS Group, 100 and 0 are the maximum and the minimum (theoretical) values, which indicate the least and the most degrees of the political risks, respectively. (In other words, a higher political risk rating indicates a lower level of political risk). Arab Spring is the dummy variable taking the value of 1 if the year is equal or greater than 2010. Artprice Paintings is the Global Artprice Paintings Index.*** and ** indicate the 1% and 5% significance levels, respectively.

The results in Column (I) report the effects of the BIST, the Artprice Paintings index, and the overall political risk measure. The BIST and the Artprice Paintings index positively affect the TAM, but the coefficient of the Artprice Paintings index is not statistically significant. Since a higher political risk rating indicates a lower level of political risk, the higher level of the political risk decreases the return of the TAM. The results of Column (II) drop the Artprice Paintings index and the results are similar to Column (I). The results of Column (III) consider the explanatory variables in regression (II) and including a dummy variable for the Arab Spring. The

results are similar to Column (I), i.e. the BIST and the political risks positively and negatively affect the return of the TAM, respectively. The results in Column (IV) confirm the negative effect of the Arab Spring on the return of the TAM by dropping the overall political risk measure. Finally, Column (V) provides the lagged form the explanatory variables instead of the current form and the results confirm the results of the benchmark estimations in Column (I).

In short, the results of the regressions indicate that the Arab Springs and the political risk in Turkey negatively affect the TAM. We suggest that these issues could be the main explanation of the diminishing returns of the TAM since 2011. Indeed, the political clash known as the Arab Springs began in 2011. In addition, our data indicate that political risks in Turkey have been gradually increased since 2013.

6. CONCLUSION

The dissertation constructs the most comprehensive art price index for Turkey using 32,391 manually collected sales transactions over the period 1990–2016 including artworks of 413 artists. Our dataset is unique when compared to the previous studies examining the art market in Turkey. For

example, Seçkin and Atukeren (2006)'s dataset captures only 1030 sales of 13 artists for the period from 1989 to 2006Q1, while Seçkin and Atukeren (2009) use a dataset of 4431 paintings of 74 Turkish artists over the period 1990–2005. Our dataset includes 8968 sale records for the same period (1990–2005), which is more than double of these previous studies. Moreover, the dissertation updates the art market data till 2016. This is only an important aspect from the period of 2005–2016 is a crucial and interesting period as Turkey not only experienced record high growth rates, but also witnessed political stability. The art market has grown steadily over the period under concern. However, stability leaves to an uncertainty, and since 2011 Turkey and its region have experienced a political instability and uncertainty.

The resulting index (with a return of 3.49%) underperforms the stock market (8.55%) while leading to a higher return compared to Artprice Global Index (0.15%). Once we divide the sample into two periods as 1990–2010 and 2011–2016 as we observe a decline in 2010, the results are still same as the increasing political risk and decreasing value of the TRY against the USD affected both the art market and stock market negatively. The correlation between the Turkish art market index and Borsa Istanbul

is 0.56 which implies that diversification across these markets will not allow investors to reduce portfolio risk.

The results of the causality test indicate that there is a bidirectional causality (called as the feedback effects) between the Turkish art market and BIST indexes. Furthermore, there is a significant causality that runs from the global art market price index to the domestic (Turkish) art market price.

The Arab Springs and the political risk in Turkey could be the main explanation of the diminishing returns of the TAM since 2011. Indeed, the political clash known as the Arab Springs began in 2011. In addition, our data indicate that political risks in Turkey have been gradually increased since 2013.

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8. APPENDIX

Previous Literature for the Returns on the Art and the Stock Markets

Paper	Art Returns	Stock Returns	Year	Country
Higgs (2012)	1.17 (17.35)	1.54 (9.78)	1986–2009	Australia
Kraeussl and Logher (2010)	12.67 (26.53)	47.54 (69.61)	1985–2008	Russia
Kraeussl and Logher (2010)	7.72 (21.08)	45.83 (117.8)	1990–2008	China
Kraeussl and Logher (2010)	46.29 (36.87)	35.46 (27.16)	2002–2008	India
McQuillan and Lucey (2016)	13	8.49	1998–2007	London (Islamic Art)
Renneboog and Spaenjers (2013)	3.97 (19.05)	6.63 (16.54)	1957–2007	Europe and the U.S.
Kräussl (2015)	13.9 (31.5)	4.5 (21.9)	2000–2012	MENA, including Turkey
Higgs and Worthington (2005)	6.96 (16.51)		1973–2003	Australia
Renneboog and Van Houtte (2002)	5.6 (19.4)	8.9	1970–1997	Belgium

Agnello and Pierce (1996)	9.3	13.1	1971–1992	The U.S.
Witkowska (2014)	–2.51	–	2007–2010	Poland
Witkowska and Kompa (2015)	–2.88	–3.43	2007–2013	Poland
Seçkin and Atukeren (2009)	61.3 (78.89)	60.4 (88.3)	1990–2005	Turkey
Seçkin and Atukeren (2006)	54.87 (99.73)	60.36 (88.3)	1989–2005	Turkey
Shi et al. (2017)	5.63 (24.47)	5.36 (28.37)	2000–2015	China
Potocki and Rogozinska (2016)	44 (50)	13 (33)	2000–2009	Poland
Hsieh et al. (2010)	8.39 (40.70)	1.58 (29.97)	2000–2009	China
Renneboog and Spaenjers (2011)	12.40 (12.25)	10.63 (15.81)	1997–2007	Russia
Hodgson and Seçkin (2012)	3.67 (12.74)	–	1968–2008	Canada
Mei and Moses (2002)	4.9 (42.8)	6.6 (8.7)	1875–1999	The U.S.
Agnello (2002)	4.2 (23.1)	11.6 (12.1)	1971–1996	The U.S.
Worthington and Higgs (2004)	3.03 (10.12)	13.95 (13.21)	1976–2001	Worldwide
Dimson and Spaenjers (2014)	7.2 (13.2)	11.2 (21.6)	1900–2012	The UK
Renneboog and Spaenjers (2015)	1.99 (17.67)	6.75	1971–2007	Italy
Renneboog and Spaenjers (2015)	1.75 (15.56)	9.58	1976–2007	Denmark

Notes: The standard deviations are given in the parenthesis under the returns where applicable. Frey and Eichenberger (1995) and Frey and Pommerehne (1989) provide a detailed presentation of the returns on the art investments before the 1990s.