Art and the Economy: A First Look at the Market for Paintings in Turkey

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Abstract

We investigate the relationships between the return on investments in paintings and other financial investments in Turkey. To this aim, we estimate a hedonic price index for a portfolio of Turkish painters. We find that investing in the market for paintings is a viable alternative even in an environment of high inflation and large macroeconomic volatility. The portfolio under investigation yielded a small but positive real return. Still, stock market returns are higher than the returns in the art market. Furthermore, we find a rather high correlation between stock returns and art market returns. However, the returns to investing in paintings are negatively correlated with the returns on traditional investment alternatives in a developing country context, such as foreign exchange, gold, and bank deposits. Hence, there might exist some room for portfolio diversification. Nevertheless, the time horizon of the investments is a key factor especially in portfolios involving art objects.

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1. Introduction

Investment in art objects and collectibles as a means of portfolio diversification and a possible inflation hedge has been receiving increasing attention.[1] Nevertheless, the functioning of the arts markets have been studied mostly in the context of developed countries.[2] In this study, we investigate the relationships between the return on investments in art objects and other financial investments for a developing country with a volatile macroeconomic environment and high inflation rates. In particular, we focus on the market for Turkish artists' paintings in Turkey. Turkey is an interesting case since it is a middle-income developing country with a rather developed industrial structure but one which experienced frequent macroeconomic crises and persistently high inflation rates until recently. In Turkey, a database for the results of art objects auctions dating back to 1989 is available (www.lebriz.com). Nevertheless, to the best of our knowledge, this study is the first one to construct a price index for the paintings market in Turkey. In an emerging markets context, it is also one of the few studies on the topic.[3]

In what follows, we first construct a hedonic price index following, among others, Hodgson and Vorkink (2004) and Higgs and Worthington (2005).[4] Next, we examine the performance of art market investments vis-à-vis the investment in stocks, foreign exchange, gold, and bank deposits. Our findings indicate that investing in the market for paintings by Turkish artists is a viable alternative to conventional investments even in an environment of high inflation and large macroeconomic volatility. The portfolio under investigation yielded a small but overall positive real return for the 1989-2005 period, beating the returns on holding US dollars or gold while the 12-month bank deposits had higher returns. Investing in the stock market also yielded higher returns than investing in paintings. This is in line with the previous findings in the literature that art investments produce lower returns than stocks. Furthermore, the returns in the market for paintings in Turkey for the 1989-2005 period appear to be more volatile than all other investment alternatives. Nevertheless, for the 1999 – 2005 sub-period, the volatility in the returns to investing in Turkish paintings has been lower than that of investing in the Istanbul stock exchange.

The remainder of the paper is organized as follows: Section 2 presents the data and the econometric method as well as results obtained. Section 3 concludes the paper.

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[1] Several studies find evidence that art objects and collectibles can provide a hedge against inflation. Ibbotson and Brinson (1987) correlate the prices of coins, stamps, Chinese ceramics, and old masters' paintings against various financial assets. Their results show a negative correlation between the art and collectible items and the returns on financial assets. For the period 1947-1988, Cardell et al. (1995) also confirm that stamps have negative correlation with inflation and other financial assets' returns.

[2] The best known price index for the world art market is due to Mei and Moses (2002). Goetzman (1993) and Ashenfelter and Graddy (2003) provide a survey of the literature on the economics of art. See also Frey and Pommerehne (1989) and Frey and Eichenberger (1995) for a critique of the issues and a comprehensive list of the empirical results.

[3] See Edwards (2004) for a study of the arts markets in Latin American countries and the creativity patterns and rates of return for Latin American painters.

[4] Chanel et al. (1996) use hedonic regressors to estimate art price returns for paintings by impressionists and their followers. Following Chanel et al., Agnello (2002) also uses hedonic log price model to estimate the rate of returns of American paintings sold at auctions from 1971 to 1996. Hodgson and Vorkink (2004) study the market for paintings by Canadian painters for the 1968 – 2001 period. Their results show that the returns to investing in Canadian artists' paintings are lower than the stock market returns but their variability is similar. Higgs and Worthington (2005) estimate a hedonic model and obtain an average rate of return for Australian art as 7 percent over the 1973-2003 period with a standard deviation of 16 percent.

2. Econometric Model and the Results

2.1 The Model

In the literature on the economics of arts markets, various approaches have been proposed to estimate the returns on art investments. One of the most commonly used methods is the estimation of a hedonic price regression. The hedonic price approach is a flexible one and it has originally been used to develop a price index for computers, cars, real estate markets, etc.[5] The idea is to capture the physical characteristics of the item at hand by accounting for its directly observable properties as explanatory variables. At the same time, an index for the time dimension is represented by a dummy variable which takes the value "1" for the period the transaction takes place and "0" for all other periods. Assuming that there are M characteristics on K items (say, paintings) sold over T time periods, the estimable hedonic regression model takes the following form:

$$\log(P_{kt}) = \alpha_1 X_{11t} + \alpha_2 X_{21t} + \ldots + \alpha_M X_{MKT} + \beta_1 Z_1 + \beta_2 Z_2 + \ldots + \beta_T Z_T + \varepsilon_{kt} \quad (1)$$

where log (P_{kt}) is the natural log of the price of the item (k = 1,…, K) sold at time t (t = 1,…,T), X_{mkt} is a set of the quantifiable characteristics (m = 1,…,M) of the item k at time t, $Z_1 \ldots Z_T$ are the time-period dummies, and ε_{kt} is a well-behaved error term.

In the context of the market for paintings, the measurable characteristics are generally represented by the name of the painter, the date of the painting's making, the dimensions (height, width, or total area, as well as the square of the total area), the medium it was painted on, the technique used, the genre of the painting, and any other information on the painting and the painter. Then, the estimates of the α's in the above equation indicate how much impact such characteristics have on the price of the painting, while the estimates of the time dimension dummies (β's) show the average market price of the item at a given time after accounting for the differences in the characteristics of the product under investigation. Since the price index for the market for paintings will be based on the estimates of β, it is important to obtain unbiased estimates of the β's by including as many characteristics on the painting and the painter as possible and by estimating the equation with an efficient and consistent method.

In our empirical set-up, we examine the auction market performance of a rather small portfolio of Turkish painters. As such, we do not claim to calculate a general price index for the entire paintings market in Turkey. Nevertheless, the choice of the painters is diverse enough and covers some well-known Turkish old masters as well as currently active newer generation of painters. The names of the painters and the number of their works included in our study are as follows: Abidin Dino (163), Avni Arbaş (173), Bedri Baykam (41), Burhan Doğançay (97), Erol Akyavaş (19), Komet (33), Mehmet Güleryüz (6), Nejat Melih Devrim (36), Nuri İyem (169), Osman Hamdi Bey (14), İbrahim Çallı (82), Bedri Rahmi Eyüboğlu (60), and Fikret Mualla (137). The total number of observations is 1030.

As for the medium on which the painting was made, we considered the following: canvas (347), paper (373), wood (52; includes wood and plywood), cardboard (141; includes carton, cardboard, and prestual), and duralite (117). There were many different techniques applied to these media, but we considered only those for which there are enough observations to generate meaningful results and aggregated all others (e.g., collate, lithography, pencil, various pressing/printing techniques, acryl, pastel, etc.) into an "other technique" category.

[5] Hedonic price index approach was initiated by Court (1939), developed by Griliches (1971) for car prices, and Ridker and Henning (1967) for housing. Shiller (1991) observes that a repeat sales estimator is a hedonic estimator where hedonic variables consist of only commodity dummy variables - one for each commodity.

Overall, the techniques included are: oil (549), watercolour (96), gouache (126), mixed techniques (126), ink (48), and others (58).

The auction data were obtained from www.lebriz.com by subscription and cover the period from 1989 to 2006(Q1). The price of the paintings sold are expressed in Turkish Liras (TL) in nominal terms. It should be noted that the Turkish art markets are rather shallow and that the auction houses have become active rather in the more recent times. In the earlier periods, private art galleries and houses as well as those operated by commercial banks were the main outlets for the sale of art pieces. As a result, the distribution of the auctioned paintings by the above list of artists is skewed towards the post-2000 period (827 of the total of 1030 transactions took place between January 2000 and April 2006) in our sample. However, the inclusion of the 1990's data allows us to have more efficient estimates for the post-2000 period and also provides a first glimpse into the developments in the market for paintings in the 1990s. As future research, we plan to increase the number of observations, especially for the 1990s, by including more painters in our sample.[6] The following are the auction houses through which the information on the sales of the paintings in our dataset was obtained: Portakal (119), Maçka Mezat (264), Artium (135), Koleksiyon (42), Antik (188), Artı Mezat (183), Pera (44), Eskidji (3), Burak Filateli (12), Alif (19), and Bali (20).

It should be noted that since we denote the price variable in the equation (1) in natural logs, the percentage difference between a given characteristic (painter, medium, technique, auction house, etc.) with respect to the variable taken as the base for that category is given by $\exp(\alpha_j)-1$. With respect to the time dummies, the rate of change from period t to t+1 can be calculated by $\exp(\beta_{t+1}- \beta_t)-1$.

In principle, the β coefficients measure the average price within a given year since the sales can take place at any time of the year (although not many auctions take place during the summer months). Thus, the rate of change on the β coefficients should be interpreted as the year-average over year average changes in the price index for paintings One implication is that the returns on art thus calculated should be compared with the returns on other financial assets or investment alternatives that are calculated on a similar basis, i.e. year-average over year-average values of the stock indices or foreign exchange rates should be used in the calculations. Another implication is that the volatility of returns to investing in the market calculated by hedonic price regressions may be found to be lower than if they were calculated as year-end over year-end changes. Hence, the volatility comparisons with other financial assets should also be made on a compatible basis, that is by using the year-average over year-average returns series. The magnitude of the difference between using the year-end versus year-average return calculations is hard to assess since it will depend on the individual price path of each asset during the year.[7]

Returning back to equation (1), the number of time periods is 18 covering the 1989-2006 period. The 2006 data are those available till April 2006. The number of characteristics associated with the paintings in our sample include 13 painters, 5 types of media for paintings, 6 types of techniques, 8 auction houses, a dummy for whether a particular painting has a title (name), and the size of the painting. In addition, a category had to be omitted from each type of characteristics in order to avoid perfect multicollinearity in the presence of full set of time period dummies for the time of the auction. The choice was made as follows. For the painters, we take Nuri İyem as the basis. As a result, the estimated coefficients on other painters reflect how much higher or lower their work was auctioned with respect to Nuri İyem's paintings in our sample. Nuri İyem is a good choice for such a comparison not only because the number of

[6] Chanel et al. (1996) suggest that hedonic price method applied to extended data set provide a better basis for studying the predictability of returns and the efficiency of the art market.

[7] We would like to thank an Associate Editor of this *Journal* for suggesting the point discussed in this paragraph.

his paintings is high in our sample but especially also because his life span (1915 – 2005) coincides with both older and newer generations of painters. For the medium of paintings, we took the cardboard category as the basis. For the techniques, we exclude the "other technique" category and compare the performance of various techniques against it. Similarly, we excluded the auction house "Artium" in the assessing the differences in the prices of paintings sold through various auction houses. Regarding the dimension variable for the size of the paintings, we include two measures. The first one is the usual overall area of the paintings in cm-squares (height times width), and the second one is the square of the area. Larger size paintings generally sell for more, but the increase in the price need not be a linear function of the size. Indeed, it is found in the literature that oversized paintings have a rather limited market and thus the square of the size is expected to be negative. All in all, the number of characteristics (M) included in our set-up of equation (1) is 34, T=18, and the number of items auctioned (K) is 1030.

2.2 Estimation Results

We estimate equation (1) by the generalised least squares method and employ White's (1980) robust covariance matrix correction to obtain heteroskedasticity consistent standard error estimates of the coefficients. We present the estimation results in Tables 1 and 2. Please note that the results in the following Tables are those obtained from a single jointly estimated regression equation, but they are presented separately for convenience.

Table 1 (section A) shows the segment of the estimation results that covers various types of media on which the paintings were made and the techniques used in making them. Again, the results are those obtained against the base variables, namely "other techniques", "cardboard", and "Artium", for the techniques, medium, and the auction house categories, respectively.

It is found that the paintings that were made by using "Oil", "Watercolour", "Gouache", and "Mixed Technique" were valued higher than those made with a variety of "Other Techniques", while "Ink" paintings/drawings did not have any statistically significant price difference in comparison to "Other Techniques". It also turned out that paintings made on "Canvas" and "Duralite" had higher prices than those on "Cardboard". Interestingly, paintings on paper were sold for a lower value, and those on various types of wood (including plywood) did not have any significant difference to "Cardboard". These results indicate that the durability of the medium of the painting is a factor that increases its sales value. "Cardboard" is more durable than paper, and "Canvas" and "Duralite" are more durable than "Cardboard". This distinction might be important in considering the "investment" value of paintings made on different types of media.

Regarding the painters considered in our sample, Table 1 (section B) shows that Dino, Arbaş, Baykam, Güleryüz, Komet, and Devrim's paintings were valued (statististically) lower than those of İyem while the paintings by Osman Hamdi Bey, Fikret Mualla, and İbrahim Çallı had higher values than İyem's in the auctions considered in our dataset. This is in line with the general market view in Turkey[8].

Table 1 (section C) shows that paintings with a title name were sold for about a 27% higher price. The size of the painting is also a significant determinant of the price. Also, the square of the size of the painting has a negative and statistically significant coefficient – a result which is again in line with our previous discussion.

[8] . Osman Hamdi Bey, for example, is one of the old masters in Turkish painting history. One of his paintings titled "The Turtle Trainer" was sold in an auction at the end of 2004 for about 3.5 million US dollars. Nevertheless, we excluded this auction record from our dataset since it constituted a very large outlier. Only 10 of the 1030 paintings in our data set were sold above US$ 100,000.

Table 1. Hedonic Price Regression for Turkish Paintings (1989-2005)

A. Medium and Technique		
Variable	**Coefficient**	**Probability**
Oil	0.966991	0.0000
Watercolour	0.391528	0.0004
Gouache	0.934224	0.0000
Ink	-0.035177	0.7817
Mixed Technique	0.522754	0.0000
Paper	-0.286001	0.0009
Canvas	0.230853	0.0170
Wood	0.024851	0.8500
Duralite	0.229470	0.0476
B. Painters		
Variable	**Coefficient**	**Probability**
Dino	-0.466819	0.0000
Arbaş	-0.242954	0.0032
Baykam	-1.687605	0.0000
Doğançay	0.069069	0.5975
Akyavaş	0.313930	0.1572
Komet	-0.565567	0.0000
Güleryüz	-0.852242	0.0087
Devrim	-0.844936	0.0000
Osman Hamdi Bey	3.409020	0.0000
Çallı	1.574058	0.0000
Eyüboğlu	-0.006233	0.9646
Mualla	0.897714	0.0000
C. Other Characteristics		
Variable	**Coefficient**	**Probability**
Title	0.265371	0.0000
Size	0.000189	0.0000
Size-squared	-3.13E-09	0.0004

Table 2 displays the estimates of the time-period dummies and the year-over-year percentage changes in the average price of a representative painting in the Turkish art market. First of all, it is clear that the returns on the art market in Turkey have been quite volatile. This is in line with the history of economic developments in Turkey which comprises an environment of persistently high inflation (but not hyperinflation) and frequent macroeconomic and banking crises. For instance, the 1998-1999 and 2001 crises are very well captured by our estimation results.

On the statistical side, the adjusted-R^2 of the weighted regression equation is 0.878. The Jarque-Bera test for the normality of the residuals yields a value of 27.02, which indicates that the residuals are not normally distributed. Nevertheless, the statistics on skewness and kurtosis is 0.12, and 3.75, respectively. As such, the residuals appear to be only slightly skewed and the distribution is a bit flatter than the normal distribution. In any case, our

estimation method yields consistent parameter estimates under non-normality and heteroscedasticity. As future work, we will consider estimating the model with a robust method, such as the least absolute deviations (LAD).

Table 2. Hedonic Price Index Estimates for the Auction Market for Paintings in Turkey (1989-2005)

	Estimated β Coefficients	**Std. Errors**	**Price Index for Paintings in Turkey (% Change)**
1989	13.19916	0.284314	---
1990	13.84150	0.466437	90.1
1991	14.08384	0.209085	27.4
1992	14.30393	0.204789	24.6
1993	14.30351	0.480354	0.0
1994	15.62480	0.361215	274.8
1995	16.64589	0.202182	177.6
1996	17.12269	0.231920	61.1
1997	18.56355	0.221943	322.4
1998	18.70509	0.421025	15.2
1999	19.17015	0.264972	59.2
2000	19.85046	0.164982	97.4
2001	19.82826	0.169471	-2.2
2002	20.54763	0.150632	105.3
2003	20.69405	0.153849	15.8
2004	20.78434	0.170361	9.4
2005	20.63510	0.179670	-13.9

2.3.1 An Analysis of the Returns to Investing in Turkish Paintings in View of Other Investment Alternatives and Macroeconomic Developments in Turkey

We now investigate the returns to investing in the market for paintings in Turkey in more detail. We begin by placing the results shown in Table 2 in perspective with the returns on other investment alternatives and macroeconomic indicators for the 1989-2005 period in Turkey. In an emerging markets context, holding foreign exchange is generally considered to be a safe way to hedge one's investments against inflation or macroeconomic instability in general. Therefore, we consider the changes in the Turkish Lira / US dollar exchange rate as an investment alternative. Investing in gold also serves a similar purpose and holding gold is a traditional practice in Turkey. Next, we include the option of investing in a term deposit. For this purpose, we use the 12-month interest rates at commercial banks. This also serves as a simple opportunity cost measure.

Last but not least, we look at the developments in the Istanbul Stock Exchange (ISE 100 index). The ISE index we use is denoted in Turkish lira terms and thus comparable to our price index for paintings. The dividend yield is not included in the reported ISE series;

therefore we also present the dividend yield series in order to capture the returns to investing in stocks inclusive of dividend payments.

As discussed earlier, we calculate the returns on these investment alternatives on a year-average over year-average basis in order to compare them to the returns on the market for paintings on a consistent basis. In this context, we present the consumer price index (CPI), also on a year-average over year-average basis. Table 3 shows the returns on paintings and other investments and the developments in the consumer price index as well as the real GDP growth to bring the developments in the real sector into the picture.

Table 3. Nominal Returns on Art and Other Investments in Turkey (%)

	Art Market TL	Forex TL/USD	Gold (24 kt.)	Interest Rate (12M TL Deposits)	Istanbul Stock Exchange (ISE 100)	ISE Dividend Yield	CPI (Year-avg.)	Real GDP Growth
1990	90.1	22.82	23.45	57.58	310.25	2.62	60.31	9.3
1991	27.4	60.34	51.24	66.13	-6.59	3.95	65.97	0.9
1992	24.6	64.64	57.03	73.65	6.28	6.43	70.08	6.0
1993	0.0	60.44	68.44	74.46	181.50	1.65	66.09	8.0
1994	274.8	170.01	181.46	69.30	87.67	2.78	106.26	-5.5
1995	177.6	53.6	55.88	74.99	97.89	3.56	93.63	7.2
1996	61.1	77.95	78.24	92.79	68.81	2.87	80.35	7.0
1997	322.4	86.93	58.61	93.03	200.67	1.56	85.73	7.5
1998	15.2	71.67	54.07	93.31	52.28	3.37	84.64	3.1
1999	59.2	60.91	51.95	85.49	89.96	0.72	64.87	-4.7
2000	97.4	48.46	49.29	38.19	129.28	1.29	54.92	7.4
2001	-2.2	96.47	90.83	62.17	-26.05	0.95	54.40	-7.5
2002	105.3	22.88	41.81	53.88	4.12	1.20	44.96	7.9
2003	15.8	-0.85	15.08	40.28	15.66	0.94	25.30	5.8
2004	9.4	-4.74	7.95	23.61	60.78	1.37	10.58	8.9
2005	-13.9	-5.73	2.42	19.88	49.49	1.71	8.18	7.4

Note: The figures for TL/USD exchange rate (forex), Gold prices, Istanbul Stock Exchange Index (ISE 100), and real GDP growth are expressed in year-average over year-average percentage change terms. The 12-month interest rates on TL deposits and ISE dividend yields are in levels. The consumer price index (CPI) is calculated as a year-average over year-average figure. By construction, the art market price index (ART TL) is expressed as year-average over year-average percentage change.

A first look at the real GDP growth figures in Table 3 shows the presence of large macroeconomic crises in 1994, 1999, and 2001. Also, the returns to all types of investments have been quite volatile, reflecting an environment of macroeconomic instability. Consumer price inflation exceeded 100 percent during the 1994 crisis and stayed above 50 percent until 2002. Inflation figures started moving into the single-digit territory only in 2004-2005.

Against this macroeconomic background, the market for paintings in Turkey yielded an annual nominal return of 54.9 percent during the overall 1989-2005 period. Given that the year average over year-average CPI inflation is 54.3 percent during the same period, investing in paintings in Turkey appears to have produced a non-negative real return, which just provides a hedge against inflation. During the same time period, the average stock returns amount to 60.4 percent in TL terms per annum. Adding to that the average dividend yield of about 3 percent, investing in stocks has produced higher returns than investments in paintings in Turkey. This result is in line with the international evidence that stock returns are generally higher than the returns in the art markets [e.g., see Frey and Eichenberger, 1995].

Regarding the relative performance of investing in paintings to other alternatives than stocks, we observe the following. Generally considered to be a safe investment in a developing country context, holding US dollars (hence, the term "dollarisation"), yielded lower returns than investing in art. However, placing the Turkish liras into a 12-month term deposit appear to be the second best practice following the stock market investments. Nevertheless, the default risk by commercial banks should also be taken into account, especially in times of macroeconomic crises. With respect to holding gold, the relative performance of the investments in paintings in Turkey changes over time. For example, investing in gold turned out to be inferior to investment in paintings in the 1990-1999 period, while gold investments did better than the art market in the post-2000 period.

Table 4 present the average nominal returns to the investment alternatives we have discussed earlier by various periods in our sample along with the standard deviations of the returns.

Table 4. Annual Average Percentage Returns to Various Investments in Turkey

	1989 -2005	**1989 -1999**	**1999-2005**	**2002-2005**
Art Market Index (TL)	54.87	72.08	23.28	2.21
…Std. Deviation	99.73	114.12	48.52	52.34
Forex (TL/USD)	46.14	61.75	18.03	-2.86
…Std. Deviation	44.30	38.09	39.14	13.45
Interest Rate (12M TL Deposits)	57.46	68.63	32.50	20.07
…Std. Deviation	23.52	12.51	22.95	15.72
GOLD (24 kt.)	47.46	57.05	26.35	6.21
…Std. Deviation	41.48	42.23	31.13	17.45
Stock Market (ISE 100)	60.36	79.55	25.51	29.12
…Std. Deviation	88.30	96.52	53.17	26.94
Memoranda				
CPI (Year-average)	54.32	68.26	26.61	10.65
…Std. Deviation	27.98	14.96	22.89	16.92
Real GDP Growth	3.91	3.41	4.12	5.47
…Std. Deviation	5.40	5.17	6.74	1.31

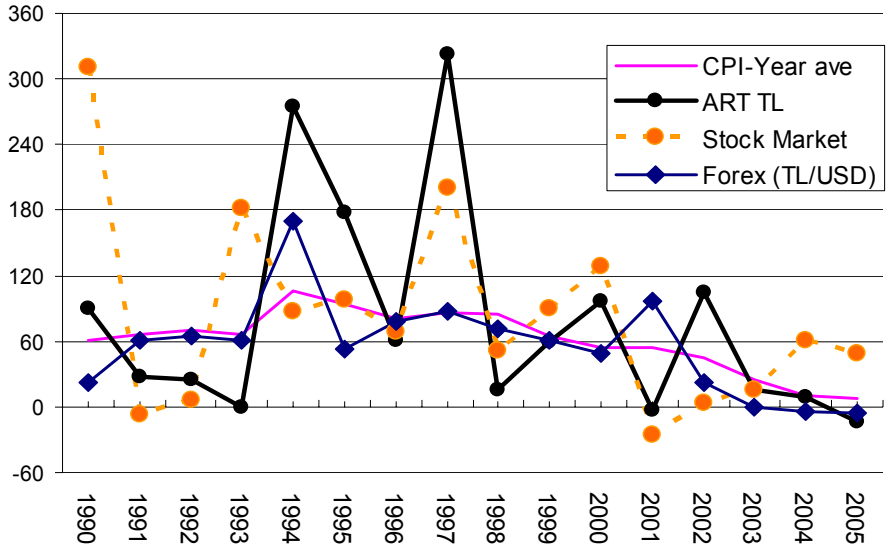
The risk profiles (measured by the standard deviations of the returns) of the investments considered in Table 4 suggest that the returns to art investments are the most volatile of all. In some sense, this is an expected results since the art market in Turkey is shallower than other financial asset markets. For example, it is estimated that the overall size of the market for paintings in Turkey is about 20-25 million US dollars a year at best, which also includes the sales of paintings through art galleries.

Still, it should be kept in mind that the standard deviation of the interest rates on time deposits in commercial banks does not include the default risk or appropriation risk. In fact, a number of banks went bankrupt during the 2001 crisis. Holding gold or foreign exchange at a bank is again subject to similar risks not captured by the standard deviations of returns on these investments. Holding them at home has its own risks and insuring the holdings of such assets at home is not a widespread practice in Turkey. The paintings purchased in art auctions, on the other hand, are generally insured against theft, fire, etc. This comes, of course, at additional cost which varies according to the circumstances.

Compared to the investment in stocks at the Istanbul Stock Exchange from a risk – return point of view, the art market produces lower returns with higher variability in the 1990-

1999 period. During the 1999-2005 period, however, the stock market proved to be more volatile than the art market investments while the average return on stocks is only slightly higher. Figure 1 diplays the returns on paintings, stocks, and holding foreign exchange.

Figure 1. Nominal Returns on Paintings, Stocks, and Foreign Exchange (year-average over year-average % change)



It is often stated that art market investments are uncorrelated with other conventional financial investments. Thus, investing in art objects may well lead to a diversified portfolio despite the somewhat lower returns on art investments. As we see in Tables 3 and 4, the returns on the Turkish paintings market seem to be correlated with macroeconomic conditions, which also affect other investments, such as the stock market. To quantify this relationship, we calculate the simple pair-wise contemporaneous correlation coefficients between the investments in paintings (Art market), stock market (ISE 100), foreign exchange (FOREX), gold (GOLD), and interest rates (TL 12M). We present the correlations for both the nominal and real returns (adjusted by the CPI). We also include the real GDP growth (RGDP) to measure the correlation between returns to different investment alternatives and real economic activity. The results are shown in Table 5. Please note that upper triangle shows the correlation structure of real returns and the lower triangle displays the correlation structure of nominal returns.

Table 5. Pair-wise Simple Correlations of Returns on Investment Alternatives and Real GDP Growth in Turkey (1989 – 2005)

	ART Market (TL)	Istanbul Stock Exchange (ISE 100)	Forex (TL/ USD)	GOLD (24 kt.)	Interest Rate (12 month TL deposits)	Real GDP growth
Art Market (TL)	1.0000	0.2763	0.1969	0.1280	-0.5006	0.0477
ISE 100	0.4026	1.0000	-0.3625	-0.3494	-0.0273	0.4988
FOREX	0.5427	0.0054	1.0000	0.8919	-0.3581	-0.7590
GOLD	0.5064	-0.04717	0.9585	1.0000	-0.3930	-0.6219
Interest Rate	0.3597	0.4026	0.6398	0.4851	1.0000	0.1670
Real GDP growth	-0.0467	0.3874	-0.6440	-0.6285	-0.2653	1.0000

Note: Upper triange shows the simple correlation coefficients between real returns (nominal returns minus CPI) and the lower triange shows the simple correlation coefficients between the nominal returns.

An examination of the correlation structure of the returns on art market investments in Turkey for the 1989 – 2005 period demonstrates that they are most closely associated with the returns on the stock market (r=0.2763 for real returns and r=0.4026 for nominal returns). High inflation also moves the TL price of the paintings in line with other nominal values. The correlation between the returns on Turkish paintings and real GDP growth is very low and indeed much lower than that of the stock market returns and the real GDP growth. (The correlation between the real returns on paintings and stocks with real GDP growth is r=0.0477 and r=0.2763, respectively, for the 1989-2005 period.)

Nevertheless, when the figures in Table 3 are re-examined, it appears that the art market reacted differently to the 1994 economic crisis than it reacted to the 1999 and 2001 crises. In 1994, the real returns in the market for paintings were positive while in 1999 and 2001 they turned negative. Looking at the behavior of foreign exchange rates, gold, and the stock market in 1994, it turns out that only the stocks yielded negative returns (ex-post). Investors may have reacted to the 1994 crisis by moving away from the stock market and by trying to hold other assets including paintings that they think would stay as a store of value. In 1999 and 2001, however, we do not see the same behavior. Further research is needed to explain the differential reaction of investors to macroeconomic crises in Turkey.

The empirical implication of the above discussion is that we re-calculate the correlation between the returns (both nominal and real) to different assets considering only the post-1994 period. The correlation coefficients are presented in Table 6 in a similar format as Table 5.

Table 6. Pair-wise Simple Correlations of Returns on Investment Alternatives and Real GDP Growth in Turkey (1995 – 2005)

	ART Market (TL)	Istanbul Stock Exchange (ISE 100)	Forex (TL/ USD)	GOLD (24 kt.)	Interest Rate (12 month TL deposits)	Real GDP growth
Art Market (TL)	1.0000	0.6581	-0.1899	-0.4456	-0.3119	0.4199
ISE 100	0.7794	1.0000	-0.2153	-0.4400	-0.1719	0.4893
FOREX	0.3968	0.2664	1.0000	0.7439	0.2433	-0.6927
GOLD	0.2818	0.0547	0.9473	1.0000	0.2732	-0.4862
Interest Rate	0.4671	0.3283	0.8275	0.7435	1.0000	-0.2849
Real GDP Growth	0.3090	0.3591	-0.5123	-0.5209	-0.3037	1.0000

Note: Upper triange shows the simple correlation coefficients between real returns (nominal returns minus CPI) and the lower triange shows the simple correlation coefficients between the nominal returns.

For the 1995-2005 period, we see a much stronger correlation between the art market and the Istanbul stock exchange. In addition, a strong correlation between the stock market, art market and the real GDP growth is established. Nevertheless, the ex-post real returns in the market for paintings correlate negatively with those on investments in foreign exchange, gold and bank deposits in the 1995 – 2005 period.

As a result, due to its negative correlation with gold, foreign exchange, and 12-month real interest rates on TL deposits, investing in paintings with the purpose of portfolio diversification in mind might prove useful. However, the total exposure to stocks and art investments should not increase since the correlation between them is high in both nominal and real terms.

3. Conclusions

Contrary to some common folk beliefs, there are no extraordinary financial returns from investing in art compared to other investments. Such beliefs may arise due to the fact that some pieces of art, every now and then, make large returns and such events make headlines. Nevertheless, the same is true for the stock market as well. Some stocks in some sectors shoot up and produce returns which are well in excess of the overall stock market returns.

It should noted that we have used the so-called hammer prices in calculating the returns to investments in paintings. This is in line with the practice in the literature [e.g., Hodgson and Vorkink, 2004]. There might indeed be non-negligible transaction costs and additional taxes. In Turkey, the current practice of the auction houses is to charge a commission of about 6-7% of the hammer price to the buyer. According to anecdotal evidence, 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. These figures and practices, however, may change from auction house to auction house and over time.

Overall, it can be said that investing in the art market represents a viable alternative to conventional investments even in an environment of high inflation and large macroeconomic volatility. For the portfolio of painters and the time period we have examined in our sample, investing in the arts market, even in the local currency (Turkish Lira), appeared to have produced slightly positive real returns and provided a hedge against inflation. It should also be emphasized that we consider only the financial returns to investment in art in our study. The much-discussed psychic returns in the literature [e.g., Stein, 1977; and Frey and Eichenberger, 1995] due to the aesthetic good nature of the paintings are not included in our figures.

We have also found that stock market returns are higher than the returns in the art market. This is generally in line with the literature. Nevertheless, we find a rather high correlation between stock returns and the art market returns, which is contrary to the low correlation between the returns to investing in art objects and stocks reported in the literature. This may, however, arise due to the shallowness of both the art market and the financial markets which are commonly affected by macroeconomic fundamentals. Furthermore, we have found that the returns to investing in paintings in Turkey are rather negatively correlated with the returns on traditional investment alternatives in a developing country context, such as foreign exchange, gold, and bank deposits, especially for the 1995 – 2005 period. Hence, some reallocation of investments in foreign exchange, gold, and bank deposits into paintings may lead to a better portfolio diversification. Nevertheless, the time horizon of the investments is a key factor especially in portfolios involving art objects.

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APPENDIX

A. List of Painters Included in the Sample

Painter	Birth – Death Year	Number of Works in the Sample
Osman Hamdi Bey	1842 – 1910	14
İbrahim Çallı	1882 – 1960	82
Fikret Mualla	1904 – 1967	137
Bedri Rahmi Eyüboğlu	1911 – 1975	60
Abidin Dino	1913 – 1993	163
Nejat Melih Devrim	1923 – 1995	36
Erol Akyavaş	1932 – 1999	19
Avni Arbaş	1919 – 2003	173
Nuri İyem	1915 – 2005	169
Burhan Doğançay	1929 –	97
Mehmet Güleryüz	1938 –	6
Komet (Coşkun Gürkan)	1941 –	33
Bedri Baykam	1957 –	41

B. Data Sources

The auction data on paintings were obtained from http:\\www.lebriz.com (by subscription). The data on gold prices, TL / US dollar foreign exchange rate, 12-month interest rates, and real GDP growth were obtained from the Central Bank of the Republic of Turkey (http:\\www.tcmb.gov.tr). The data on ISE 100 index and dividend yield series were taken from the Istanbul Stock Exhange (http:\\www.ise.org\data.htm).