
Art as an investment: return, risk and portfolio diversification in Chinese contemporary art

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This article aims to evaluate how Chinese contemporary art performs as a stand-alone investment, as well as in a mixed-asset portfolio. Based on the Artron Artist Index (AAI), the weighted average method is employed to estimate the return and risk of Chinese contemporary art investments during the period between 2003 and 2014. Additionally, an optimal portfolio consisting of stock, government bonds, corporate bonds, gold and Chinese contemporary art is constructed using the Mean-Variance model. The findings of this article suggest that Chinese contemporary art outperforms stock and corporate bond while it underperforms government bonds and gold when risk and return are taken into consideration. What's more, it is recommended that Chinese contemporary art be included in an investment portfolio to derive diversification with a weight limit around 25.3%

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1. Introduction

The past decade has witnessed the rapid expansion of art auctions on the Chinese marketplace. Flourishing as a result of the prosperity of China's art market, Chinese contemporary art is capturing the global spotlight, regularly setting astonishing auction records. In 2006, for example, Chinese vanguard artists represented by Zhang Xiaogang and Yue Mingjun broke the one million dollar record one after the other, consolidating their presence on the global auction market. In 2007, Chinese contemporary art accounted for 24% of global contemporary auction sales, with 75 pieces exceeding a price of one million dollars and 36 artists included in the "Contemporary Top 100 List" produced by Artprice (Artprice, 2007). Furthermore, with 41.4% of global art auction revenues in 2011, China won a larger share of the art market than the US for the first time (Artprice, 2011). In the contemporary art sector alone, China and the United States are now running neck and neck with 33.7% of global contemporary art sales in 2012-2013 (Artprice, 2013).

These figures clearly indicate that Chinese contemporary art has increased in value dramatically and is now attracting a great deal of attention from investors. Nowadays, it is commonly believed that the art market yields larger profits in comparison to conventional investment markets. Furthermore, due to the unique characteristics of the art market, evidence shows that it tends to have a low correlation with the traditional financial market (Chanel et al., 1994; Campbell, 2008). It is therefore possible that the

overall risk can be reduced by including artwork in an investment portfolio.

Our research attempts to investigate the financial performance of Chinese contemporary art as a stand-alone investment, as well as in a mixed-asset portfolio. Through empirical research, we try to answer the question of how Chinese contemporary art performs in comparison with traditional financial investments when the transaction cost is taken into account. Furthermore, we examine the diversification attributes of Chinese contemporary art in an attempt to identify how it correlates with the financial market and the extent to which it fits into an investor's portfolio.

The rest of the article is organized as follows. Section 2 briefly introduces the findings of the relevant literature on the financial performance of art investments, while Section 3 considers the data and methodology employed in the empirical research. Section 4 then sets out the empirical results. Finally, conclusion and caveats are presented in Section 5 and 6.

2. Literature Review

Early studies on the financial performance of artwork investments date back to the 1960s, when Reitlinger published his three-volume compendium *The Economics of Taste*. Due to the different methods, various data sources and sample periods employed, the specific results differ widely as regards rates of return and risk. Most of the studies suggest that artwork investments produce relatively lower monetary

returns and involve a higher degree of risk compared to conventional investments such as stocks and bonds (Anderson, 1974; Stein, 1977; Baumol, 1986; Frey and Pommerehne, 1989; Renneboog and van Hutte, 2002; Renneboog and Spaenjers, 2009; Spaenjers and Renneboog 2013). In contrast to mainstream findings that artwork is an inferior investment property compared to conventional financial assets, Goetzmann (1993), Buelens and Ginsburgh (1993), Mei and Moses (2002), and Taylor and Coleman (2010) are among the few who are more optimistic, perceiving higher return rates than certain traditional financial investments based on a more disaggregated data set analysis (such as different schools and time periods).

Along with return rates and risk, the academic field has also paid attention to investigations of the correlation between the art and financial markets. Researchers are encouraged to identify whether artwork is eligible when it comes to improving the diversification of investment portfolios. Opinions on whether art is a superior vehicle for diversification purposes are mixed. Research led by Goetzmann (1993), Chanel and Olivier (1994), Goetzmann and Spiegel (1995), Chanel (1995), Tucker et al. (1995), Mandel and Benjamin R (2009), and Pesando and Shum (2008) find some evidence that the financial market has an influence on art price movements. As a consequence, artwork adds little value when it comes to diversifying an investment portfolio. In contrast, studies carried out by Pesando (1993), Tucker, Hlawischka and Pierne (1995), Mei and Moses (2002), Campbell (2005, 2008), and Jurevičienė and Daiva (2012) detect a relatively low or even a negative correlative relationship between the financial

and the art markets, and thus view art diversification favourably. However, unlike the studies referred to above, the work of Worthington and Higgs (2004) reveals their pessimism about art in terms of portfolio diversification, even though they detect very little correlation between works of art and financial assets. In particular, they suggest that this might be due to the fact that the risk-return attributes of art are inferior to those of financial assets and add little diversification benefits.

While the Chinese art market has grown at a rapid pace, transaction data is rather dispersed and inadequate. Indeed, very few empirical studies have been carried out on this subject. Of those that do exist, Mok et al. (1993) and Zhao and Huang (2008) are the most representative. The former use Sotheby's and Christie's auction records from 1980-1990 to study the financial performance of modern Chinese paintings. Twenty art pieces that have been sold twice were selected as the sample of artwork for return estimation purposes. To make a comparison with the financial market, the authors employ the Singapore Strait Time Market Index, Hong Kong's Hang Seng Stock Market Index and Taiwan's Weighted Index as proxies. After taking risk into consideration, it is found that art investments significantly underperformed these three financial markets. Zhao and Huang (2008), meanwhile, collect the sales records of 482 Chinese paintings that are sold more than once by auction houses in China. Using a repeat-sales regression approach, the authors construct a series of semi-annual art indices from 1994 to 2007, estimating an average return rate of 10.1%, with a standard deviation of 5.03%, outperforming the stock market during the same period. What is

more, a negative correlation (-0.51) between the art market and the stock market is detected, suggesting an opportunity for portfolio diversification using Chinese works of art.

3. Data and Methodology

This section describes our data set and outlines the methodology employed in this research.

3.1. Data

A new data set is constructed to measure the financial performance of Chinese contemporary art. The data is semi-annual, since China's art auction sales are held in spring and autumn each year. Stocks, bonds and gold are selected as comparable financial classes and component assets for the investment portfolio purposes. Given that data sets for constructing the bond market index are only available from 2003 onwards, all of the data employed in the research start from the year 2003 to allow comparability. The empirical research thus covers the period between 2003 and 2014.

3.1.1 Artron artist index (AAI)

Due to the fact that the price index concerning only Chinese contemporary art was unavailable at the time of the research, it was decided to construct a new database to estimate contemporary art return. Having looked up all public sources in various ways,

it was ultimately chosen to target the Artron artist index (AAI).¹

Artron is a leading research center dedicated to monitoring and analyzing the Chinese art market. Based on China's first and most comprehensive database, the Artron Index is widely used in the Chinese art market (Artprice, 2012). In 2000, Artron began to release the AAI of Chinese modern and contemporary art. By that time, the number of sample artists had reached 574, including the most influential modern and contemporary artists in China with wide ranges of schools and materials. The AAI is calculated based on the average price per square foot of a particular artist across major domestic and Hong Kong auction sales² in each auction season.

The AAI is comprised of Chinese modern and contemporary artists. We therefore first excluded modern artists from the data set to obtain a sample of their contemporary art counterparts. However, there are different opinions regarding the definition of Chinese contemporary art. According to Western academic views, contemporary art refers to the works of art created by artists born after 1945, although China's contemporary art transition was actually interrupted by political and social upheavals in

¹ Artron artist index, retrieved from: http://amma.artron.net/artronindex_artist.php, Jun 13th, 2013.

² Auction houses list: Beijing Poly international, Beijing ChengXuan, Beijing HanHai, Beijing Huangchen, Beijing Kuangshi, Beijing Rongbao, Beijing Yongle, Chieftwon Auction, Guangzhou Huangyi, Shanghai Duoyunxuan, Shanghai Hongsheng, Shanghai Tianheng, Shanghai Daoming, Xilian Auction, Ravenel Auction, Sungair International, China Guardian, HK Christie's, HK Sotheby's. Retrieved from: http://amma.artron.net/index_detail.php#yb, Jun 13th, 2013.

the 1960s. Indeed, it was not until the 1970s that Chinese contemporary art emerged on the marketplace.³ As a consequence of this delayed modernization, during the 1960s and 70s many young artists still saw their output as modern art.

Different boundaries in separating modern and contemporary art in China and the West make it more difficult when it comes to selecting sample artists. Since a comprehensive list of modern Chinese artists is not available, we take two steps to exclude this group from the AAI. First, we refer to the top 50 modern Chinese artists in the 2012 Autumn Auction Report provided by Artron and exclude them from our list. Then, we exclude the remaining artists who were born before 1945. As a consequence, thanks to these two steps we basically remove the price effect of modern artists and superstar artists.

After constructing our list of contemporary artists, a data set for estimating market returns and risk is required. Indeed, to obtain a sample pool that can be compared across different years, the artists in the sample list need to have continuous transaction records in the observation period. We therefore filter out the artists who had at least one lot sold in each auction season. Ultimately, we obtain a data set of 43 artists with a total of 13,811 lots traded in the period 2003-2014.

³ Source retrieved from: <http://library.stanford.edu/guides/chinese-art-modern-and-contemporary> on June 26th, 2013.

3.1.2 Financial asset index

In our research, stocks, bonds and gold are selected as the proxies of financial assets. For stocks, we chose the Shanghai Stock Exchange composite index as a proxy for the Chinese stock market. Developed on December 19, 1990, this tool is a capitalization-weighted index with a base value of 100 that tracks the daily performance of all A and B-shares listed on the Shanghai Stock Exchange (SSE). It is the most widely-used indicator when it comes to tracking price movements of the overall market.

In terms of the bond market, we chose the SSE corporate bond index as our indicator. This instrument is computed from the prices of selected corporate bonds with a good representation from the domestic corporate bond market. The base day of this index is December 31, 2002. With a base value of 100, the index is weighted by amounts outstanding and was launched by the SSE on June 9, 2003. For government bonds, we use the SSE government bond index as the proxy for a risk-free asset. This index is calculated on the basis of the weighted average price of all government bonds listed on the SSE. All of the listed bonds mature over the course of a year with a fixed interest rate. The base day of this bond index is December 31, 2002. With a base value of 100, the index is weighted by amounts outstanding and was launched by the SSE on January 2, 2003. As far as gold is concerned, a composite index for the Chinese gold market is unavailable. However, as most investors benchmark the gold price in the New

York Commodity Exchange (COMEX), herein we use the gold index launched by COMEX as the indicator of the Chinese gold price.

To estimate the return rate and risk of financial assets, we employ closing price indices on the last transaction day of each month as our data set. The data cover the time period of 2003 to 2014.

3.2 Methodology

Based on the artist indices, the weighted average method is adopted to estimate the return rate and risk of Chinese contemporary art (He, 2010). It should be noted that in our research, a tax adjustment is made to produce a closer real return rate of art investments. Return rate means the net semi-annual yielding rate of a Chinese contemporary art investment, while risk refers to the standard deviation of the return rate.

3.2.1 Estimat return rate of Chinese contemporary art

- Calculate the semi-annual return rate $r_{i,t}$ by artist adjusted for relevant tax:

$$r_{i,t} = \begin{cases} \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \times (1 - T), r_{i,t} > 0 \\ \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}, r_{i,t} \leq 0 \end{cases} \quad (1)$$

where $r_{i,t}$ is the semi-annual return rate of artist i in the time period t ; $P_{i,t}$ is the artist index for artist i in the time period t . T is the tax rate for auction gains, and

here we employ the 20% for our calculations according to Chinese tax law.

- Obtain a continuously compounded return rate $R_{i,t}$,

$$R_{i,t} = \log(1 + r_{i,t}) \quad (2)$$

- Assign a weight $X_{i,t}$ to each compounded return rate:

$$X_{i,t} = \frac{V_{i,t}}{V_{M,t}} \quad (3)$$

where $V_{i,t}$ is the transaction volume of artist i in the time period t ; and $V_{M,t}$ is the total transaction volume for all of the selected artists in the time period t .

- Calculate the semi-annual return rate for contemporary art investment R_t :

$$R_t = \sum_{i=1}^{43} X_{i,t} \times R_{i,t} \quad (4)$$

3.2.2 Estimate the return rate of financial assets

$$\Delta p_{i,t} = \ln \frac{p_{i,t}}{p_{i,t-1}} \times 100 \quad (5)$$

where $\Delta p_{i,t}$ denotes the rate of change of $p_{i,t}$; $p_{i,t}$ is the average value of the monthly closing price indices of the financial asset i in the half yearly time interval. Since the financial index is not available in a semi-annual term, we use the average value of each six-monthly closing price index for the proxy of the semi-annual index of financial assets. Given that the tax associated with financial assets trading is so low, we

ignore these costs while estimating the return rate.

3.2.3 Mean-variance model

According to modern portfolio theory, a collection investment asset with a low or negative correlation has a lower risk than any individual asset given a certain level of expected return (Markowitz, 1952). To research in greater detail the extent to which Chinese contemporary art diversifies an investment portfolio, we use the Mean-Variance model to construct the optimal portfolio. First of all, we run the model on the raw data set. To achieve a better estimation, we then refine the data set by performing a bootstrap analysis before running the model again.

3.2.4 Bootstrap technique

By randomly resampling some of the observed data, the bootstrap method is a simple but useful tool for pre-processing a data set to accounts for the distortions caused by an inadequate sample size. As the database used for the estimation is not particularly extensive due to the inferiority of the artist index and the scale of the sample size, it would be better to perform the bootstrap method to improve the robustness of the mean-variance results. We thus run a bootstrap with 1,000 iterations, which are taken as the average of all of the iterations.

4. Results

4.1 Return rate and risk

Table 1 sets out the semi-annual return rate of Chinese contemporary art and the relevant financial assets during the period 2003-2014. Figure 1 shows the return rate in terms of tendency. As can be seen from the graph, stocks fluctuate the most compared to other assets.

Table 1. Summary of the semi-annual return rate, 2003-2014

Year	Art	Stock	Government Bond	Gold	Corporate Bond
2003aut	4.95%	-6.79%	-1.67%	9.42%	-2.86%
2004spr	12.76%	11.63%	-3.76%	3.74%	-4.80%
2004aut	8.92%	-17.14%	-0.90%	5.62%	-1.28%
2005spr	16.44%	-14.30%	6.15%	1.48%	7.75%
2005aut	13.14%	-3.28%	6.66%	8.79%	11.81%
2006spr	0.27%	24.26%	1.79%	25.43%	3.55%
2006aut	-6.82%	30.13%	0.75%	3.34%	-0.77%
2007spr	3.96%	57.23%	0.28%	5.95%	0.40%
2007aut	7.50%	41.82%	-0.88%	12.23%	-4.54%
2008spr	-2.51%	-35.05%	2.50%	19.95%	2.25%
2008aut	-7.32%	-53.78%	3.70%	-8.06%	6.46%
2009spr	-1.48%	11.90%	3.24%	10.24%	6.67%
2009aut	7.95%	23.31%	0.56%	10.39%	-1.05%
2010spr	8.02%	-7.45%	2.14%	10.97%	4.66%
2010aut	6.38%	-2.82%	1.54%	12.81%	3.10%
2011spr	12.51%	2.99%	1.05%	10.56%	1.21%
2011aut	0.63%	-15.26%	1.88%	14.12%	0.67%
2012spr	-0.29%	-4.56%	1.98%	-1.49%	4.36%
2012aut	-2.26%	-10.73%	1.72%	2.12%	3.51%
2013spr	-2.42%	6.85%	1.58%	-12.93%	3.58%
2013aut	1.78%	-5.35%	1.24%	-13.46%	1.91%
2014spr	-0.97%	-4.07%	1.35%	-1.23%	1.77%

Source: Own elaboration.

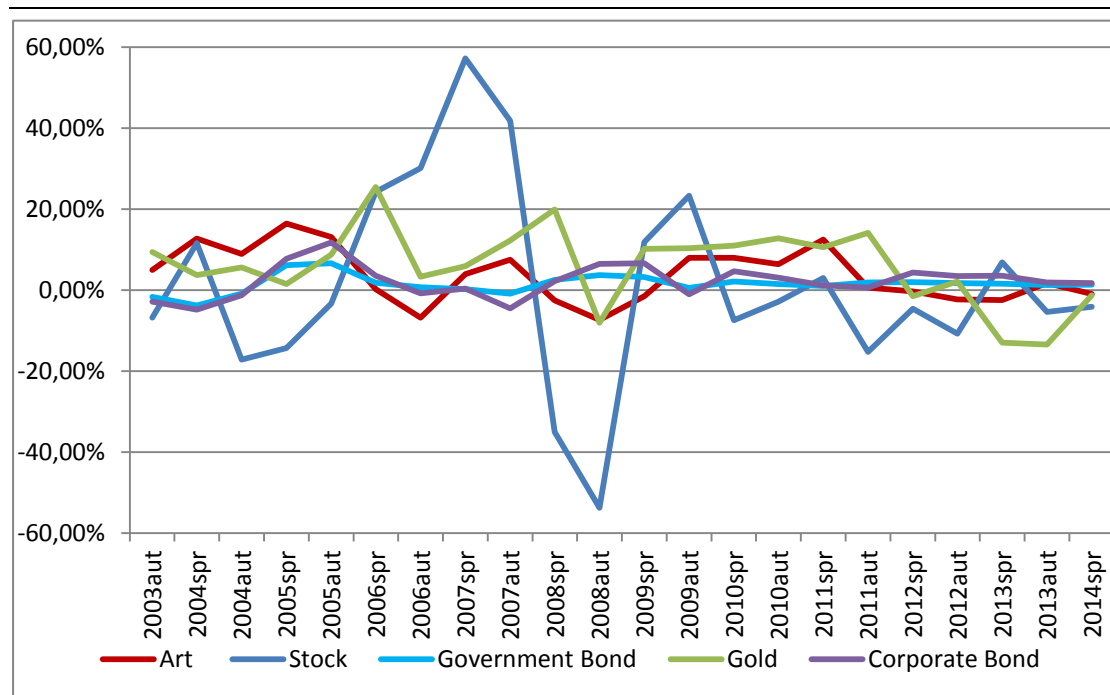


Fig. 1. Return performances of art and financial assets, 2003-2014

Source: Own elaboration.

Table 2 shows the descriptive statistics concerning art and financial assets during the research period. On average, the auctioning of Chinese contemporary art has a rate of return of 3.69%, which is higher than the returns of stocks and bonds, but lower than the gold. The positive financial return supports the position that Chinese contemporary art is a beneficial capital asset.

Table 2. Descriptive statistics of art and financial assets, 2003-2014

	Art	Stock	Government Bond	Gold	Corporate Bond
Average Return	3.69%	1.34%	1.50%	5.91%	2.20%
Median	2.87%	-3.68%	1.56%	7.37%	2.08%
Standard Deviation (Risk)	6.66%	24.41%	2.29%	9.55%	4.00%
Skew	-85.11%	97.36%	143.88%	37.00%	40.62%

Kurt	20.96%	20.00%	21.40%	-34.90%	30.13%
Min	-7.32%	-53.78%	-3.76%	-13.46%	-4.80%
Max	16.44%	57.23%	6.66%	25.43%	11.81%
No. of Observation	22	22	22	22	22

Source: own elaboration.

4.2 Portfolio diversification

According to modern portfolio theory, the level to which Chinese contemporary art can reduce the risk in an assets portfolio mainly depends on the extent to which the returns between art and other assets are correlated (Markowitz, 1952); the lower the correlation between asset classes, the greater the likelihood that a portfolio will either maintain its returns while reducing risk or will have the same level of risk with increased returns. Table 3 sets out the correlation coefficients between Chinese contemporary art and relevant financial assets during 2003-2014. The return rate of the former has a relatively low correlation with stock (0.1519) and gold (0.2213) and a negative correlation with bonds and gold (government bond=-0.0215, corporate bond=-0.0417). However, the P-value of each of these correlations is higher than 0.01, implying that the art return is uncorrelated to the other assets (Mandel 2009). On the basis of this scenario we can therefore propose that Chinese contemporary art is a candidate asset class that could play a role in portfolio diversification.

Table 3. Correlations between art and financial assets, 2003-2014

	Art	Stock	Government Bond	Gold	Corporate Bond
Art	1				

Stock	0.1519	1			
Government Bond	-0.0215	-0.3702	1		
Gold	0.2213	0.2037	-0.0455	1	
Corporate Bond	-0.0417	-0.3922	0.9376	-0.1219	1

Source: own elaboration

In the following stage, optimal portfolios with and without art are constructed using the Mean-Variance model. An optimal portfolio is derived from the perspective of a Chinese investor who has the opportunity to invest in these assets. Using the Matlab program, we run the Mean-Variance model with relative data and obtained the following results.

4.2.1 Mean-variance model on raw data

Tables 4 and 5 report 10 possible optimal allocations for a portfolio with and without contemporary art. In the optimal portfolio without art, corporate bonds are excluded when they give a low portfolio return rate and risk (see Table 4). This is due to the fact that corporate bonds correlate significantly with government bonds while carrying an inferior risk/return ratio. However, when the expected portfolio returns and risks increase to a certain level, stock and government bonds are excluded due to their relatively weak return rate.

As can be seen from Table 5, in the optimal portfolio as an asset Chinese contemporary art plays a relevant role in decreasing the portfolio risk. The weight

assigned to art can be up to 32.42% as portfolio return increases to the level of 4.98%.

Afterwards, the weight of art asset is decreased as the return rate increases until it was excluded when the portfolio return reaches around 5.91%.

Table 4. Optimal portfolios without contemporary art, 2003-2014

No.	Stock	Gov Bond	Gold	Corp Bond	Port Return	Port Risk
1	3.63%	92.77%	3.60%	0.00%	1.65%	2.02%
2	2.34%	83.38%	14.28%	0.00%	2.12%	2.26%
3	2.27%	52.89%	21.25%	23.59%	2.60%	2.79%
4	2.45%	18.14%	27.47%	51.94%	3.07%	3.38%
5	1.45%	0.00%	36.56%	61.99%	3.54%	4.02%
6	0.00%	0.00%	48.98%	51.02%	4.02%	4.87%
7	0.00%	0.00%	61.73%	38.27%	4.49%	5.91%
8	0.00%	0.00%	74.49%	25.51%	4.96%	7.06%
9	0.00%	0.00%	87.24%	12.76%	5.44%	8.29%
10	0.00%	0.00%	100.00%	0.00%	5.91%	9.55%

Source: Own elaboration.

Table 5. Optimal portfolios with contemporary art, 2003-2014

No.	Art	Stock	Gov Bond	Gold	Corp Bond	Port Return	Port Risk
1	6.83%	3.21%	87.47%	2.48%	0.00%	1.75%	1.97%
2	12.64%	1.84%	75.50%	10.02%	0.00%	2.21%	2.16%
3	16.98%	1.39%	48.68%	15.55%	17.40%	2.67%	2.62%
4	20.66%	1.37%	15.09%	20.16%	42.72%	3.14%	3.13%
5	24.63%	0.03%	0.00%	27.85%	47.49%	3.60%	3.72%
6	27.24%	0.00%	0.00%	39.25%	33.51%	4.06%	4.55%
7	29.83%	0.00%	0.00%	50.66%	19.51%	4.52%	5.58%
8	32.42%	0.00%	0.00%	62.07%	5.51%	4.98%	6.72%
9	20.81%	0.00%	0.00%	79.19%	0.00%	5.45%	7.99%
10	0.00%	0.00%	0.00%	100.00%	0.00%	5.91%	9.55%

Source: Own elaboration.

For a more straightforward presentation of the diversification attributes of Chinese

contemporary art, the efficient frontiers of portfolios with and without art are plotted onto a graph in Fig. 2 using the Matlab program. The graph shows that the efficient frontier of the portfolio with art is more convex than that of the portfolio without art, meaning that with the same expected return, the former portfolio offers less risk (standard deviation). This proves that Chinese contemporary art is an eligible vehicle for diversifying an investment portfolio. However, it is notable that two efficient frontiers converge where a portfolio's expected return rate exceeds 5.9% on semi-annual basis. In other words, as the portfolio's expected return rises above 5.9%, Chinese contemporary art has no diversification benefits for investors. A similar result was also indicated by Pesando (1993), who stated that art is not a candidate asset class for investors whose expected return rate from their portfolio exceeds 3.5%.

In conclusion, the preliminary results show that in the period 2003-2014, Chinese contemporary art outperforms stock and bonds but underperforms gold regarding the semi-annual return. What is more, our optimal asset allocation shows that with a low and negative correlation with conventional financial tools Chinese contemporary art has a relevant role in diversifying the portfolio.

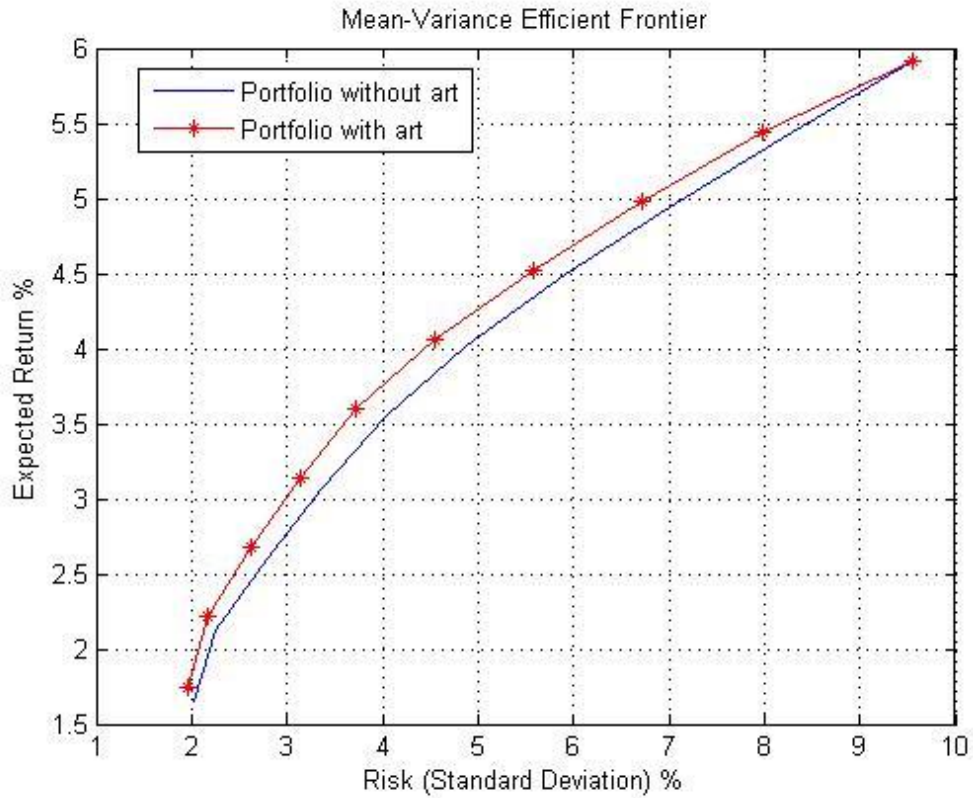


Fig .2. Efficient frontiers (with art vs without art)

Source: Own elaboration.

4.2.2 Mean-variance model on bootstrapping

Table 6 shows 10 optimal portfolios containing contemporary art based on the bootstrapped data series. The bootstrapping method has been introduced to avoid any results biases and reinforce the statistics. The results show that the presence of Chinese contemporary art is efficient along the whole frontier with weights comparable to those assigned with the simulation on raw data. More specifically, Chinese contemporary art can be included in an investment portfolio to acquire diversification benefits with a

proportion no higher than 25.35% of the total investment. In addition, bootstrapped results show more differentiated optimal portfolios in terms of the weight allocated to component assets, providing more instructive empirical advice for investors. In general, the presence and the importance of an art asset remains the same as in the raw data simulation except that the rebalancing for improved diversification has a significant effect on the gold asset, reducing its presence in the last 5 portfolios.

Table 6. Bootstrapping optimal portfolios with contemporary art

No.	Art	Stock	Gov Bond	Gold	Corp Bond	Port Return	Port Risk
1	8.21%	3.23%	85.49%	3.06%	0.01%	1.81%	2.21%
2	12.72%	2.74%	69.56%	8.94%	6.04%	2.21%	2.43%
3	16.60%	2.90%	45.70%	14.05%	20.76%	2.62%	2.85%
4	19.84%	3.38%	24.07%	19.51%	33.21%	3.02%	3.39%
5	22.42%	3.81%	10.26%	26.13%	37.38%	3.40%	3.98%
6	24.14%	4.48%	3.80%	33.89%	33.69%	3.75%	4.61%
7	25.34%	5.76%	1.30%	42.00%	25.61%	4.08%	5.30%
8	25.35%	8.00%	0.39%	50.02%	16.23%	4.36%	6.06%
9	21.07%	11.59%	0.05%	58.94%	8.34%	4.60%	6.95%
10	10.50%	18.60%	0.00%	68.90%	2.00%	4.75%	8.12%

Source: Own elaboration.

The efficient frontiers in Figure 3 further show the effects of bootstrapping on the data. The frontier of the portfolio based on the bootstrapping method is less convex than the portfolio that is not based on this approach. In other words, while giving more differentiated optimal portfolios the bootstrapping method predicts a moderate portfolio return given the same level of risk.

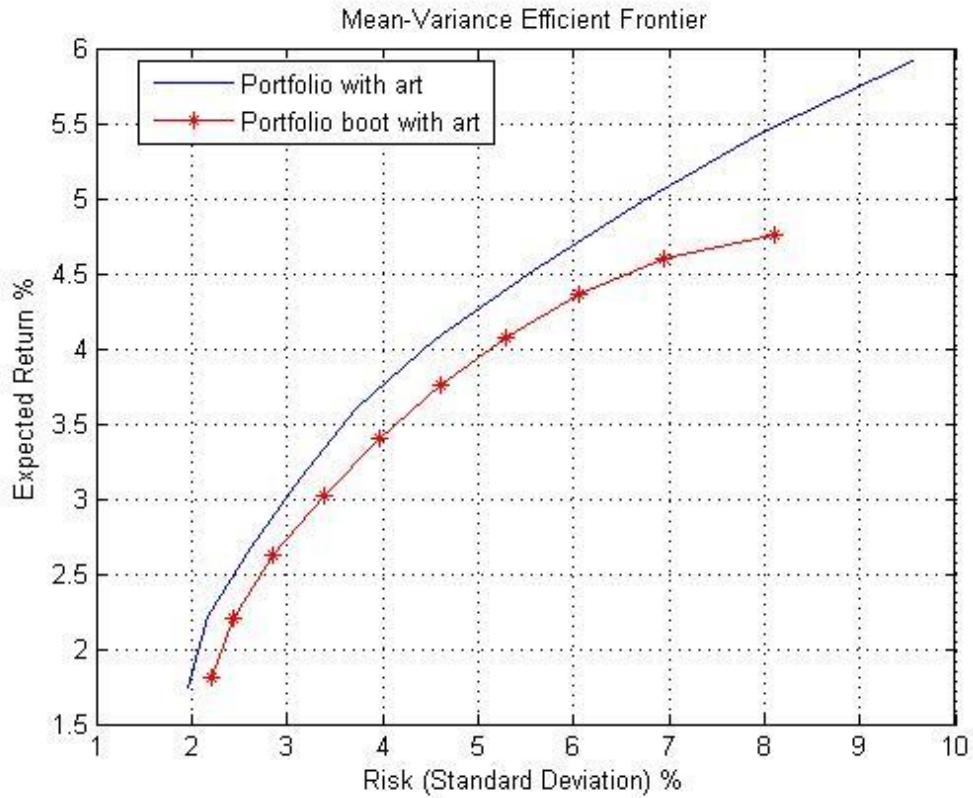


Fig. 3. Efficient frontiers of portfolio with art (on raw data and after bootstrapping)

Source: Own elaboration.

5. Conclusion

Faced with underperforming portfolios, investors are continually seeking alternative assets and sophisticated solutions to reap high returns whilst minimizing risk. In this paper, we have taken a close look at the financial implications of including Chinese contemporary art as an alternative asset class.

A total of 43 Chinese contemporary artists are selected and their price indices are

derived to estimate the market return rate using the weighted average method. The return rate with tax adjusted is calculated to offer a more accurate reflection of the real return of art investments. The market performances of traditional financial assets such as stock, government bonds, corporate bonds and gold are estimated and use as comparison values. To calculate the optimal portfolios and to draw the efficient frontiers, ten investment portfolios are assembled.

Our research shows that in the period of 2003-2014, Chinese contemporary art generated a semi-annual return rate of 3.69%, with a standard deviation of 6.66%. Based on the risk-return criterion, Chinese contemporary art is beneath gold and government bonds while above stock and cooperate bonds.

In terms of portfolio diversification performance, our research reveals that Chinese contemporary art is uncorrelated to the other assets (Mandel 2009). Investment in this art market could be encouraged due to the benefits of portfolio diversification. This finding is in line with some previous studies (Pesando, 1993; Tucker, Hlawischka and Pierne, 1995; Mei and Moses, 2002; Campbell, 2005, 2008; Campbell and Pullan, 2006; and Horowitz, 2010). Additionally, on the basis of more robust statistics obtained via the bootstrapping, it can be concluded that Chinese contemporary art is a profitable investment tool and could be included in an investment portfolio to acquire diversification benefits with a proportion no higher than 25.35% of the total investment.

These findings make a contribution in tracking the movement of the contemporary art, stock, bond and gold markets that has not yet been explored in the Chinese context. The assessment of the risk and returns of these markets allows for a better understanding of investment diversification by investors. These findings may be of special interest given the recent supportive policies for running private art museums that have been introduced in some cities (eg. Beijing, Shenzhen), which also helps explain the boom of art museums in China.

This work offers many interesting opportunities for expansion. One possibility is to include super-star Chinese contemporary artists to check the benefits of portfolio diversification in terms of return and risks features. Another is to carry out a comparative study between the Chinese context and other BRICS countries to discover shared or specific aspects and trends in the portfolio diversification including contemporary art.

6. Caveats

Limitations mainly concerning the data and methodology are addressed in this section. Data constraint comes in three perspectives: firstly, AAI is calculated based on average auction price. Simple average mean tends to absorb the fluctuated price movement. Thus artist indices are less robust than desirable. Consequently, the return rate and volatility based on the artist indices are underestimated. They are smoothed

and less inclined to reflect the price volatility on the real market (Campell, 2008). Secondly, using weighted mean of returns of sample artist to estimate the market return is a rather rough method comparing the repeat-sales method and hedonic approach. Since the weighted average method does not take into account the heterogeneous elements of artwork, the market return rate reflects a mixed effect of quality difference and price change brought by demand and supply. Furthermore, the sample artists (43 artists) in this paper take up only 40% of the total contemporary artists in the Artron. Most of the top auction record artists (e.g. Zhang Xiaogang, Zeng Fanzhi, Yue Minjun, etc.) are not included due to the fact that either their first transaction records began later than the year 2003 or they simply do not have any continuous transaction records during the observation years. Therefore, the superstar performance is not accounted in estimating the return rate.

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