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‘Is art such a good investment?
Investing in fine art
on the international and Polish auction market’

Contemporary art auction at Sotheby’s New York held on 15.05.2007.
(http://www.portfolio.com/images/feeds/blogs/auction-rothkoauction-large.jpg)

Master thesis

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1. Introduction

Art investment has a long history. Although some academics argue that financially-driven art investment began only after the Second World War (e.g. Frey and Pommerehne, 1989a), the idea that holding art might be a source of potential gains is not new. In fact, de la Barre et al. (1994, p.144) quote the 17th century diarist John Evelyn, who noted that 'even Dutch farmers pay high prices for paintings, which they resell at "very great gains"'.

Analyzing the financial performance of art may seem controversial, especially to those who purchase artworks purely for their aesthetic value. However, it cannot be denied that works of art, like commodities, financial instruments or real estate, can be a source of monetary appreciation, sometimes yielding higher returns than alternative asset classes. This can be best illustrated by the following example. In November 1987, Vincent van Gogh's 'Irises' was sold for 53.9 million dollars at Sotheby's New York. 40 years earlier, seller's mother bought them for only 84,000 dollars, which is less than 0.5 million dollars expressed in today's money terms. This purchase has thus generated an annual real rate of return of about 12 per cent to the lucky owner (Frey and Pommerehne, 1989b).

The major question is whether this case is representative of the whole art market, or is it just a notable exception. If the answer were to be given based solely on the news publicized by the media, one could conclude that art outperforms other forms of investment. The hype created around the stunning auction records (with Jackson Pollock's 'No. 5' sold recently for 140 million dollars) nourishes the widespread belief that money invested in art might yield extraordinary returns. It is further reinforced by the record-breaking sales at the major auction houses, as well as optimistic signals coming cyclically from the international art market. However, as this view is based solely on the superior performance of one particular market segment, it may not necessarily apply to other parts.

In this thesis, I attempt to verify the robustness of the argument that investing in art may generate extraordinary gains, following on from numerous previous studies that have attempted to test this hypothesis. With the ever growing interest in art as an alternative asset class and recent emergence of numerous enterprises offering art investment services, it may be the right moment to examine the strengths and weaknesses of art as a source of monetary appreciation, as well as point to the potential benefits of purchasing art for investment purposes. Moreover, previous art booms have attracted the attention of many academics, especially those active in the field of cultural economics. Therefore, the abundant literature

will allow me to gain a deep insight not only into art investment as such, but also various related aspects.

The art market possesses several characteristic features, which distinguish it from other markets. Artworks are unique, highly heterogeneous, infrequently traded and illiquid goods, whose value is hard to estimate. Moreover, art market inefficiency seems to give rise to many anomalies, which are not annulled by arbitrage.

One of the potential consequences of the anomalous nature of the art market is that it may be possible to reap above-average gains, especially with the use of superior knowledge and expertise. Moreover, it has been suggested (e.g. Campbell and Pullan, 2006) that there might be an inverse relationship between the degree of maturity of the art market and returns on art investment. This would imply that, similarly to the emerging economies, the highest rates of return could be observed on the fairly underdeveloped art markets, such as the Polish auction market. In order to verify the validity of this assumption, I have carried out an empirical research on returns on artworks sold since the beginning of the auction market in Poland. As this issue has received by far little attention, the obtained outcomes will hopefully contribute to the present state of knowledge, as well as fill in the gap in the existing literature.

This thesis is organized as follows. First, I review the literature on art investment and present the major findings, especially with regard to artworks' financial performance relative to other asset classes. Next, the process of art price formation and main determinants of art prices are discussed. This part is intended as an introduction to the analysis of return factors. In the following chapter, I shed some light on different art investment-related issues, such as the relationship between the art and other markets, and the prospects for portfolio diversification. I also discuss how to assess the monetary performance of art, analyze different avenues for allocating funds into artworks and point to the potential benefits of using art as an alternative investment vehicle. The next part concentrates on the major factors determining returns on art, especially art market-specific anomalies. In chapter 6, I describe the Polish art market and center my focus particularly on the auction market. This part serves as an introduction to the empirical study on the returns on artworks auctioned in Poland between 1990 and 2004, which is presented in the following chapter. First, I introduce the hypothesis, which will guide me through the empirical part of my thesis. Next, the study, its main findings and limitations are discussed. This chapter is followed by a conclusion summarizing the major points of my thesis. In addition, I include two appendices, in which I analyze the findings of particular papers devoted to art investment and returns on art. I also attach a CD-ROM, which contains repeat-sales data that forms the basis for the empirical study.

In this thesis, the focus is on the auction market. This choice is dictated by the fact that auction results are the only publicly available information regarding art prices. Therefore, studying returns on art is necessarily limited to those works that were purchased and resold with the intermediation of the auction house. Moreover, since art is a broad concept encompassing different categories, I narrow my analysis only to the fine art segment, i.e. paintings, drawings and prints.

2. Literature review

2.1. Introduction

Over the last 30 years, a great scope of literature has been devoted to the analysis of art investment and various related aspects. The ever growing interest in this field has been driven by the widespread belief, cyclically nourished by the media, that art can be a source of extraordinary gains. Especially the art boom in the end of the 1980s and stunning prices fetched at consecutive auctions have drawn the attention of economists, particularly those active in the field of cultural economics. As a consequence, researchers started to systematically investigate transactions on the art market.

As observed by Frey and Eichenberger (1995a), there are three main goals pursued by the authors interested in art investment, namely:

- to study the art market in a similar manner to any other market and thus enable comparisons between returns yielded by art and alternative forms of investment
- to apply the newest tools and techniques from the field of finance and econometrics to the art market
- to investigate the specific and unique features of the art market

This chapter is organized as follows. The subsequent section focuses on the empirical findings of major studies on art investment, as well as some related issues. In the third part, I point to the main shortcomings and limitations of the literature devoted to art as an alternative asset class.

2.2. Empirical findings

In order to assess whether art outperforms other alternative forms of investment, two major factors need to be considered, namely the rate of return and degree of risk involved. Only then is it possible to compare various forms of investment and draw conclusions on relative financial performance of artworks. This is indeed what most researchers do in their studies. With few exceptions, where art investment is evaluated solely on the basis of the rate of return and where no benchmarks from the financial markets are used (e.g. Buelens and Ginsburgh, 1993; de la Barre et al., 1994), authors usually construct an art price index and estimate whether artworks could be considered a good investment, as compared to other

assets (usually financial assets, such as bonds and equities, but sometimes also gold or real estate).

In this section, I summarize the general findings of the major studies. Since the literature is abundant and encompasses various types of collectibles, only those papers that research the market for fine art, in particular paintings, drawings and prints, are presented[1]. I narrow my focus to the issues I consider both most important and relevant to art investment. However, it should be noted that, even though subjective, my choice is guided by the opinions of researchers active in the field. For a detailed analysis of the findings of particular studies see appendix A.

In contrast to the widespread belief, nourished by the media, especially in times of booming art prices, academic studies seem to provide little support to the fact that art might be a superior investment. In fact, a rather consistent picture emerges from the literature – on the whole, art does not outperform other asset classes, at least in the long run. Despite huge differences in the periods and markets studied, as well as measurement methods applied, most papers report similar findings, namely that the rates of return seem to be pretty modest, as compared to alternative forms of investment, and the risk involved is high[2]. However, there are some exceptions to the general pattern that need to be mentioned.

The first one to have taken a more optimistic approach towards art investment is Goetzmann (1993). Contrary to previous studies, he claims that art can appreciate at a high rate, even in the long run. He also shows that, similarly to other financial markets, over time the art market both flourishes and declines in a cyclical manner. However, despite those favorable results, Goetzmann still recognizes the shortcomings of art investment and high volatility of art prices, and thus considers artworks a potential source of gains only to the nearly risk-averse investors.

The next significantly different finding emerges from the paper of Buelens and Ginsburgh (1993), who show that allocating financial funds into certain sub-markets (i.e. artistic movements, schools, artists, etc.), or during particular periods could result in extraordinary gains. This view seems to be supported by the stunning art records reported by the media. Nevertheless, the question remains whether such opportunities could be forecast in advance or, as claimed by Baumol (1986), as a result of changes in tastes and fashions, random behavior of art prices excludes their predictability.

[1] For an extensive overview of the literature on returns on investment in collectibles see Burton and Jacobsen (1999).

[2] However, it should be noted that in most of the studies art outperforms inflation.

The latter point of view appears to have generated particular disagreement among researchers. Some (e.g. Frey and Pommerehne, 1988, 1989a; Buelens and Ginsburgh, 1993; de la Barre et al., 1994; Ginsburgh and Schwed, 1992) postulate that it is indeed possible to predict movements of art prices, at least to a certain extent. Buelens and Ginsburgh (1993) attribute this to a wide time span between the occurrence and actual effect of a shift in tastes. Frey and Pommerehne (1988, 1989a) do not preclude that with the right expert knowledge it may be possible to predict the direction, in which art prices will evolve. This is similar to Landes' (2000) conclusion – he claims that the extraordinary returns on the Ganz collection (earned irrespective of the time period, artist, or type of the artwork) could not have been solely a result of luck, but required superior skills and expertise. Finally, Ginsburgh and Schwed (1992), and de la Barre et al. (1994) compare econometric estimates with price patterns forecast by art experts and conclude that their appraisals could compete with those made by professionals, which would support the argument that there is little randomness to art price trends. Finally, Holub et al. (1993, p.52) suggest that Baumol's (1986) finding on random behavior of art prices is based on an erroneous interpretation of statistical results and 'confusion of transactions and transactors'. On the other hand, some authors (e.g. Pesando and Shum, 2008) acknowledge the fact that prices fluctuate in a random manner.

Another important question that arises, especially with regard to Buelens and Ginsburgh's (1993) work, is whether the long-run underperformance of art precludes the possibility to reap high gains within a short time horizon. The evidence is somehow mixed. Nevertheless, various studies (e.g. Baumol, 1986; Frey and Pommerehne, 1989a) seem to support the hypothesis that extraordinary gains (but also losses) may be made during short periods, particularly in times of booming art prices. Moreover, the outcomes of various papers inspired by Buelens and Ginsburgh's (1993) findings seem to confirm the fact that returns on art investment are highly dependent on the school, artistic movement, subject matter, as well as period studied.

Furthermore, there is also disagreement on the so called 'masterpiece effect', i.e. whether the most expensive artworks yield abnormal returns. Whereas some researchers either fail to identify, or find weak or mixed evidence for the existence of this phenomenon, others try to estimate its direction and extent (for more details see chapter 5 Return factors, section 5.2.4.2.'Masterpiece effect'). Thus far, no general agreement on this issue has been reached.

In addition, while most authors observe high volatility of art prices (comparable, or often exceeding that of stocks), there are some studies that question, or even contradict this

finding. For example, Buelens and Ginsburgh (1993) suggest that higher returns do not necessarily imply higher risk. Pesando and Shum (2008) reexamine Pesando's (1993) results and come to a somehow different conclusion, namely that modern prints might be, in fact, far less risky than stocks (although still more volatile than Treasury bills). Finally, Mei and Moses (2002a) suggest that the degree of volatility of art price indices may equally depend on the sample size.

Whereas there might be no consensus with regard to the actual magnitude of returns on art investment, most researchers seem to agree on one issue, namely the existence of psychic returns (consumption benefits) derived from the pleasure of viewing or possessing an artwork. According to many authors, this additional gain compensates the owner for the underperformance of art relative to alternative forms of investment. Nevertheless, its existence and extent still remain more of a hypothetical issue (for more details see chapter 5 Return factors, section 5.2.10.Psychic versus financial returns).

Finally, many studies analyze the potential benefits of adding art to a diversified portfolio, and correlation between returns on art and other assets (e.g. equities, real estate, or gold), composition of an optimal art portfolio, as well as market inefficiency, anomalies and resulting potential opportunities for arbitrage. All those issues will be discussed in detail in the following chapters.

In the light of the above mentioned findings, one final question should be asked, namely why is it still commonly believed that art is a superior investment that offers extraordinary gains? As Frey and Pommerehne (1989a) argue, it might be partly due to the representation bias of our memory, which tends to be selective and puts an inadequately high weight on the few publicized auction records, but neglects other, less stunning sales. It might also result from the fact that investors tend to underestimate the effects of inflation and thus consider only nominal rates of return. But the most obvious explanation are the intensive publicity efforts made by the auction houses and media hype sparked by 'superstar' sales. While the most spectacular transactions form just a small fraction of the total market turnover, studies on art investment analyze sales that occur at different auction houses, at various points in time (Holub et al., 1993).

In general, although art might underperform alternative forms of investment in the long run, one should be cautious about drawing any final conclusions on its (inferior) financial performance. The first caveat is that there were times, artists, artistic schools, etc. that offered extraordinary gains to the potential investor. Two periods in particular, namely the 1950s and 1960s, as well the end of the 1980s have seen returns on art investment which

rivaled those yielded by financial assets. And even though risks involved might be relatively high, as argued by many authors, returns on art investment, especially within shorter time periods, could be still large enough to compensate the high volatility of art prices. On the other hand, some researchers observe low (or even negative) correlation between returns on art and other assets, which would suggest that art could play an important role in portfolio diversification (for more details see chapter 4 Art investment, section 4.4.Portfolio diversification). Moreover, it is still open to debate whether there is a certain degree of predictability to art price behavior. If this is true, with the right skills, expertise or insider knowledge, it could be possible to make substantial gains by allocating funds into art. In fact, Chanel et al. (1996, p.19) suggest that the idea of the predictable nature of prices cannot be rejected, for 'most statistical tests do not show that returns cannot be forecasted but only that these are not "very" forecastable'.

2.3. Limitations and shortcomings

Thus far, a consistent approach towards measuring returns on art investment has not been developed. Since previous studies concentrate on different sub-markets and time periods, their major shortcoming is that, in many cases, it is not really possible to compare or generalize the obtained results. Furthermore, as the non-transparent nature of the art market allows one to analyze only the auction market, where the data is publicly available, it is hard to estimate whether the biased figures should be adjusted downwards or rather upwards. In the following sections, I discuss some further serious limitations, which, to some extent, undermine the reliability of the empirical findings.

2.3.1. Auction data

The first major shortcoming common to most studies[3] is their reliance on auction data. This is a source of a significant bias, since auction transactions account only for around 25 per cent of all the sales performed on the art market (Sagot-Duvauroux, 2003). But whether this inflates or depresses the obtained rates of return is hard to estimate.

[3] The notable exceptions are Candela and Scorcu (2001), and Hutter et al. (2007), which focus on the dealer market.

Moreover, analysis based on auction data may result in further biases. First of all, not every hammer price is necessarily a sale price, since the artwork might be 'bought in'[4]. This clearly inflates the prices and therewith rates of return[5]. On the other hand, a complete omission of 'bought-in' works in the data set could also lead to a bias, e.g. if the item is sold in a private transaction once the auction is finished. Second, relying on auction data implies the so called 'survivorship bias', which is a consequence of the complete disappearance of some artworks from the market, usually due to unfavorable changes in tastes or fashions – only those works that do not fall out of fashion (or are not bought by or donated to a museum) and remain in demand reappear on the market (Goetzmann, 1996).

Other serious limitations result from the specific nature of the auction market. Many auction houses, especially the most renowned ones, such as Sotheby's and Christie's, accept only top-quality artworks or those that could potentially enjoy high demand. This contributes to the sample selection bias and, since many studies are limited to the transactions performed at the major auction houses, might result in an overestimation of the rates of return. It should be noted, however, that the sample selection bias is not only inherent to auction data in general. Many studies select the underlying samples based on subjective criteria, e.g. they choose only artists living in a particular city, born at a certain point in time or having high reputation[6]. As a consequence, the obtained results may not be representative for the whole art market.

Furthermore, following Guerzoni (1995), Frey and Eichenberger (1995a) suggest that auction prices should be perceived as wholesale, rather than retail prices, for they refer mostly to dealers and not private collectors[7]. If private buyers pay higher and obtain lower prices, relative to dealers, there might be also differences in the rates of return, which would depend both on buyer's and seller's identity.

In conclusion, it should be, however, noted that auction data is the only publicly available source of information on transactions performed on the art market, since the access

[4] An item is said to be 'bought in' by the auction house if the hammer price fails to reach seller's reserve price. This implies that even though the artwork is hammered down, in reality it remains unsold, but the transaction is recorded as a sale. However, the term 'buy in' does not mean that a purchase by the auction house actually takes place. In general, the reserve price, which is set by the seller, but needs to be agreed upon with the auction house, is kept secret by both parties and can be perceived as a minimum price the seller is willing to accept (Ashenfelter and Graddy, 2006). According to Artprice (2007), in 2007, the 'bought-in' rate in the fine art sector was 35.5 per cent, as compared to 34.0 per cent in 2006.

[5] It is because the highest bid for the 'bought in' work is lower than the reserve price.

[6] Maybe the best approach to selecting the sample would be to randomly draw the observations from a comprehensive database.

[7] However, nowadays, this argument might be of lesser importance, since a growing number of works is purchased at auctions by private individuals.

to prices charged by art dealers and galleries is usually restricted. Moreover, as many art dealers purchase works at auctions, it is possible that auction results serve as guideposts for art prices on the secondary and primary market (Candela and Scorcu, 2001).

2.3.2. Reitlinger data

In his three-volume compendium 'The Economics of Taste' Reitlinger (1961, 1963, 1970)[8] records auction data on some 5,900 sales that occurred between 1760 and 1960. In the introduction to the first volume, the author says (1961, p.241): 'Painters have […] been included either because they have been fashionable at one time or another or because they have generally been recognized as classical.' This statement alone shows the first major limitation of Reitlinger data as a source of information on the auction transactions, namely the great extent of subjectivity in the choice of the recorded transactions[9]. Not only did Reitlinger collect information on the works by arbitrarily chosen 'most popular' artists, but he also narrowed the sample to the high- and low-end works (Guerzoni, 1995). Finally, there is a significant overrepresentation of late 18th Century paintings, relative to other artistic schools, as admitted by the author himself (1961, p.241).

Another quote from Retlinger (ibid., p.242): 'Unless otherwise stated, the items refer to London sales. Until 1920 or thereabouts this means with few exceptions sales at Christie's.' further supports the sample selection bias. In fact, transactions performed with the intermediation of Christie's account for over 75 per cent of the recorded data (Guerzoni, 1995). Finally, Candela and Scorcu (1997) argue that Reitlinger data does not include small-sized paintings, which is another source of bias.

Holub et al. (1993) compare Reitlinger (1961, 1963, 1970) with other data sets, and detect substantial inconsistencies and contradictions. Guerzoni (1995) mentions an additional serious limitation of Reitlinger data – it does not contain information on the parties involved in the transaction. As a consequence, it is hard to verify whether no transactions between the subsequent sales occurred[10]. Furthermore, Candela and Scorcu (1997) claim that transactions recorded by the author encompass not only auction sales, but also other deals (this, however, could be seen as both the advantage and limitation of this database).

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[8] Only volumes I and III (this volume is a supplement to volume I and extends the period under study by additional 10 years) are of relevance here, since they are devoted to sales of paintings, prints and drawings, whereas volume II refers to other categories of collectibles.

[9] It should be noted that, to a varying extent, this sample selection bias is also inherent to some other databases.

[10] In fact, as agued by Guerzoni (1995), since transactions between dealers and private collectors are probably disregarded, Reitlinger data set does not account for over 50 per cent of actual sales.

A further shortcoming of Reitlinger data set that seriously affects the outcomes obtained with the use of repeat-sales regression (for more details see chapter 4 Art investment, section 4.2.1.Repeat-sales regression) is the small number of transactions recorded for the earlier periods. Moreover, some limitations of Reitlinger data have also serious implications for those studies that apply hedonic regression (for more details see chapter 4 Art investment, section 4.2.2.Hedonic regression). Since it contains a very limited number of information (e.g. it does not record detailed characteristics of paintings), relying on Reitlinger data may result in inaccurate estimates[11]. However, this shortcoming is also inherent to many other sources of auction data.

The limitations of Reitlinger database can be clearly seen when comparing the studies of Baumol (1986), and Buelens and Ginsburgh (1993). Even though the authors use the same data set and apply the same methodology, they arrive at a different number of observations (640 and 723 transaction pairs, respectively), which has implications for the obtained results. Buelens and Ginsburgh attribute this discrepancy to the subjective treatment of inconsistent information on sales recorded by Reitlinger.

On the whole, due to the above mentioned limitations, it is possible that the estimates based on Reitlinger data are biased and most probably upwards (Guerzoni, 1995).

2.3.3. Transaction and other costs

Since transaction costs (i.e. seller's commission and buyer's premium) vary across auction houses and countries, as well as time periods, and change both with the artwork's estimated value and seller's identity[12], most researchers[13] do not take them into account in their calculations. Moreover, some substantial additional costs, such as insurance, maintenance, restoration and cleaning costs, borne by the owner should be taken into consideration, especially since they are usually grater than those encountered on financial markets. Also the inability to correctly identify their extent for the earlier periods forces researchers to leave them out of their calculations. On the whole, this biases the resulting rates of return upwards and depresses the risk. However, it should be noted that some researchers

[11] As observed by de la Barre et al. (1994), the quality of a hedonic index could be greatly enhanced if the qualitative variables, such as the history and type of the artwork, or buyer's and seller's identity could be included.

[12] In some auction houses seller's commission is negotiable and depends on the bargaining power of the seller. Since 1995, it is based on a fixed sliding scale in Christie's and Sotheby's.

[13] The notable exceptions are: Frey and Pommerehne (1989a), Pesando (1993), Pesando and Shum (2007), Locatelli Biey and Zanola (1999), and Landes (2000).

(e.g. Frey and Pommerehne, 1989a) argue that costs are of importance only within short holding periods, since they can be spread over time in the long run.

2.3.4. Taxes

Due to substantial discrepancies in tax laws during various periods, as well as a lack of their harmonization across countries, researchers do not take taxes (e.g. VAT, sales and property tax, death duties) into account. In addition, there are differences in potential tax benefits[14], as well as regulations considering resale right ('droite de suite')[15] associated with purchases and sales of artworks. Furthermore, seller's and buyer's identity is usually kept secret, which makes it unclear which country's tax rates should apply to the transaction. Finally, it is hard to estimate the real effective tax burden and/or benefit associated with buying or selling an artifact (Frey and Eichenberger, 1995a). It is, among others, because tax regulations may differ from the day-to-day practice (Frey, 1997). As a consequence, the obtained rates of return are probably overestimated.

2.3.5. Measurement method

Since most researchers generally adopt two approaches towards measuring the returns on art investment – hedonic and repeat-sales regression, I will narrow my focus only to the limitations of those two methods (for more details on those and other methods see chapter 4 Art investment, section 4.2.Art price indices).

The nature of repeat-sales regression is a source of a significant bias, namely sample selection bias, since only works sold at least twice are included in the sample. By focusing on artifacts subject to repeat sales, the sample is drastically narrowed[16]. Therefore, only transactions involving artworks for which demand is high enough for at least two sales to occur (e.g. those that did not fall out of fashion and/or are of superior quality) are registered by the repeat-sales index (so called 'survivorship bias'). According to Goetzmann (1993), this implies that repeat-sales method does not account precisely for the stylistic risk resulting from

[14] For example, in the U.S. an individual can reduce her tax burden by donating an artwork to a public museum.

[15] 'Droit de suite' (resale right) is a legal entitlement for an artist to receive a fixed percentage of the sale price every time her artwork changes the owner. This right functions i.a. in many European countries and in the state of California (Heilbrun and Gray, 1993).

[16] This is of lesser concern in the case of prints. Since many impressions of the same print are frequently auctioned, assuming they are of comparable quality, it results in a relatively high number of repeat sales and reduces the sample selection bias (Pesando, 1993).

shifts in demand due to changing tastes and fashions. The author also argues that an artwork will not be put up for sale by its owner unless its (expected) market price has increased, which means a further exclusion of certain artworks from the sample. Furthermore, repeat-sales regression does not control for the external factors or changes in quality that might occur between two sales and affect the price of an artwork. Holub et al. (1993) suggest that, by reducing the number of observations, returns on particular segments calculated with the use of repeat-sales regression cannot be generalized to the whole art market.

The already mentioned limitation of hedonic approach is the dependence on the available information. If an insufficient number of variables is used, hedonic regression may fail to capture the 'true' quality of a painting, which might, in turn, result in biased estimates of returns.

In their work, Chanel et al. (1996) compare the rates of return calculated for different periods with the use of repeat-sales, hedonic and geometric repeat-sales (double-sales) approach. The discrepancies between the obtained estimates show that the choice of the measurement method can have a decisive impact on the results. It seems that until researches develop a superior, standardized method of measurement, the evidence on most issues concerning art investment will be mixed and many questions will probably remain unanswered.

Finally, a general criticism addressed at both measurement methods is that they fail to account for the external factors that may influence the demand and supply side (e.g. changes in tax regulations). As a result, price movements may be misinterpreted and attributed to wrong factors. Moreover, as pointed out by Frey (1997), in their empirical analyses, most authors rely on quantitative methods, whilst neglecting more qualitative approaches (e.g. structured or semi-structured interviews with art market participants and practitioners), which could provide them with better insights into the workings of the art market.

2.3.6. Identification of artworks

With the ever growing availability of information and easy Internet access, this limitation seems to lose on importance. However, when applying repeat-sales method, it should be borne in mind that identifying a pair of transactions involving the exactly same artwork is crucial to obtaining a reliable outcome. Unless an artifact is identified by the catalogue raisonné number or provenance, one cannot be sure to have found repeat sales of the exactly same work without verifying it visually. Therefore, whenever any doubt related to

a particular artwork occurs[17], the researcher should make sure it is correctly identified or exclude it from the sample. This is of particular importance when relying on Reitlinger data set, since it includes no descriptions of artifacts. The best way to avoid misattribution is to check the relevant photographs and information on e.g. provenance in the auction catalogues, and to consult the auction house.

2.3.7. Alternative asset classes

One of the crucial problems when determining the relative financial performance of art is to choose the rate of return on alternative assets. The most commonly used benchmarks are financial assets, such as government bonds and stocks, predominantly the U.S. and British, less commonly other assets, such as gold or real estate. The first question that arises is whether financial assets are the most appropriate for making such comparisons, especially for the earlier periods. One could argue that due to some similar characteristics, returns on real estate could be a more suitable benchmark (Frey and Eichenberger, 1995a). Moreover, the authors' subjective choice of the rates of return on alternative forms of investment used as reference points is somehow questionable, since they usually focus on two major financial markets (i.e. the U.S. and U.K.). It could be equally argued that foreign buyers and sellers may be more interested in the rates of return yielded by various instruments in their home countries. Moreover, for the periods under study, the used benchmarks are often aggregate figures and sometimes even rough estimates[18]. Finally, those numbers may be biased downwards, since they usually do not account for reinvestment of capital gains or dividends. On the other hand, they are not adjusted for commission and brokerage fees, or taxes, which has a reverse effect (Landes, 2000).

2.3.8. Comparability of results

Due to various time periods and samples studied, as well as different measurement methods applied, the obtained results should be interpreted and compared with great caution. In particular, the choice of the (base) period has a great impact on the outcomes. As some

[17] It could be e.g. due to the fact that some artworks within an artist's oeuvre have the same size and/or title (such as 'Still life' or 'Composition'). Moreover, dimensions can change over time, or they can be inaccurately measured or recorded. Finally, some titles may vary due to differences in translation, or because the work was not given a particular title by the author.

[18] This applies especially to the earlier periods, for which data is hard to obtain (e.g. Baumol, 1986).

examples (e.g. Pesando, 1993 and Pesando and Shum, 1999) show, even extending the period by a few years might result in a substantially different estimate, especially in times of booming or rapidly declining prices. Another shortcoming is that there is inconsistency across studies as to whether the reported figures are given in nominal or real terms. In addition, the authors have varying approaches towards the use of inflation rate when deflating the returns on art investment[19]. The same applies to the choice of currency[20].

2.3.9. Psychic returns[21]

Although most studies account for the existence of psychic returns (consumption benefits), very few go beyond that, and only Stein (1977) names a concrete figure. As noted by Frey and Eichenberger (1995a), many authors calculate the extent of psychic returns as a difference between the rate of return on art and alternative forms of investment, which, considering all the above mentioned limitations, is probably a very rough estimate. Moreover, it still remains to be answered whether the inferior rates of return yielded by artworks can be attributed to the existence of consumption benefits. It could be equally argued that investors, and pure speculators in particular, do not derive viewing pleasure from the purchased works. Moreover, this argument would also imply that if financial returns on art investment exceeded those on other assets, artworks would not generate any psychic benefits to their owners. On the other hand, the method suggested by Stein (1977) (i.e. measuring consumption benefits based on CAPM, with average rental fees for art objects used as a reference point) could be also questioned, due to the thinness of the art rental market (Frey and Eichenberger, 1995a)[22]. Another related limitation is that the studies rarely account for the behavioral, as well as institutional aspects, and often do not recognize that buyer's and seller's identity and/or type may be of importance when measuring the rate of return.

[19] For the more recent periods, many authors apply the IMF index. However, since art is subject to international trade, it might not be the most appropriate measure. Maybe the best approach would be to present the findings in nominal terms, which would allow the potential investor to deflate the figures by using her national CPI.

[20] As observed by Watson (1992), the choice of currency can have a decisive impact on the overall results regarding the financial performance of art. This is the case in e.g. a study by Kraüssl and van Elsland (2008), where the geometric average annual rate of return is 3.8 per cent if denominated in dollars, as compared to only 1.3 per cent if translated into euro.

[21] For more details see chapter 5 (section 5.2.10.Psychic versus financial returns).

[22] For a broad analysis of psychic returns and methods of their measurement see Frey and Eichenberger (1995a), and Atukeren and Seçkin (2007).

In conclusion, although all those limitations undermine the reliability and accuracy of the results concerning art investment, thus far no better approach has been developed. Holub et al. (1993) suggest that the shortcomings of previous research on the returns on art investment cannot be overcome, which precludes the possibility to draw any final conclusions on this matter. However, even though the results may be biased, it could be equally argued that a number, even an erroneous one, is better than no number, but only if interpreted with caution.

3. Determinants of art prices

3.1. Introduction

Artworks, in contrast to commodities or stocks, are highly heterogeneous and unique goods. Therefore, the process of price formation on the art market differs substantially from the one encountered on other markets. Whereas the price of a good is typically an outcome of the interplay between supply and demand, this does not hold for the art market[23]. Since production costs cannot serve as reference points[24] (Sagot-Duvauroux et al., 1992), as it is in the case of other goods, the 'true' value of an art object is hard to estimate and translate into monetary terms. Therefore, it is often argued (e.g. Goetzmann and Spiegel, 1995) that an artifact is worth as much as the buyer is willing to pay and seller willing to accept[25]. This point of view is reflected particularly on the tertiary market, where some artworks fetch astronomically high prices (Mamarbachi et al., 2008). Whereas several years ago the scenario of art prices crossing the 100-million-dollars threshold was still somehow surreal to a lay observer, with each new record reported by the media, the notion that 'sky is the limit' becomes increasingly widespread[26]. However, even though there is a certain degree of unpredictability involved in the process of art price formation and, similarly to oil prices, there seems to be no halt to the rapid increase in prices fetched by art objects, there are certain factors specific for the primary, secondary, as well as tertiary market that determine the price of an artwork.

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[23] It should be noted that some authors (e.g. Schneider and Pommerehne, 1983) argue that art prices are determined by supply and demand. However, this assumption does not seem to always hold (Sagot-Duvauroux et al., 1992). This is not to say that supply and demand are irrelevant for art price formation, but the price is not solely an outcome of the interplay between them. This point of view is reflected in e.g. pricing strategy of gallery owners who avoid decreasing prices, even in the face of declining demand, since it might signal inferior artistic quality. Another example is the existence of the so called 'Veblen effect', as a result of which demand for artworks may increase with their growing prices. It is because higher prices might be interpreted as a sign of superior quality, or can provide buyers with prestige or status benefits (Plattner, 1996).

[24] The importance of production costs as determinants of art prices is favored by e.g. Frey and Pommerehne (1989b), who identify them as one of the factors influencing supply and, therewith, prices of cotemporary art. In theory, production costs can be treated, to some extent, as explanatory variables when considering differences in prices between various media (e.g. paintings are, in general, more expensive than drawings or prints). In practice, however, if production costs were really significant for the whole market, one would observe a decline in supply as a result of their increase, which does not seem to be the case, especially on the auction market.

[25] On the auction market, seller's willingness to accept is usually equal to the reserve price.

[26] The first artwork to cross the 100-million-dollars line was Pablo Picasso's 'Garçon à la Pipe' (1905) sold for 104.17 million dollars at Sotheby's New York on 5th May 2004. Currently, the most expensive painting is Jackson Pollock's 'No. 5' (1948) sold on 1st November 2006 for 140 million dollars in a private deal.

In this chapter, the process of art price formation is analyzed. I consider it an essential prerequisite for comprehending what affects the returns on art investment – the major area of my interest. As already mentioned in the first chapter, I focus on the auction market for fine art (i.e. paintings, drawings and prints). It should be, however, noted that besides a wide scope of determinants common to all the sub-markets, there are many factors that differ substantially between the primary, secondary and tertiary market[27]. Moreover, prices in those sub-markets are interrelated and depend highly on the price levels reached in each of them[28]. Finally, the impact of particular factors on art prices varies across different price and quality ranges, as well as market segments (Ursprung and Wiermann, 2008).

It should be also noted that the list of those determinants is not fixed and has changed over time. Whereas until the mid-17th century art prices depended mostly on production costs, during the academic period in France (from the mid-17th till the end of the19th century) the subject matter was decisive in determining the price of an artwork. Since the turn of the 19th century, with the ever growing importance of more intangible aspects, such as originality, uniqueness, artistic expression and innovation, as well as diminishing significance of craftsmanship, artist's name has had the strongest effect on the price (Sagot-Duvauroux, 2003). As noted by Velthuis (2005, p.122), it was the time when 'a cult of the creative individual came into being' and 'focus in appraising art shifted decisively […] from individual canvases to careers of artists'.

In line with some previous studies (e.g. Sagot-Duvauroux et al., 1992; Rengers and Velthuis, 2002; Worthington and Higgs, 2006), I cluster the determinants of art prices in three groups containing artwork-, artist-specific and external factors, which are analyzed in the subsequent sections.

3.2. Artwork-specific factors

Many studies, especially those applying hedonic regression, identify determinants of art prices that are related to the characteristic features of an artifact. Whereas many are easily observable, some, especially artistic quality, are hard to measure. As a consequence, translating them into quantitative terms implies a certain degree of subjectivity.

[27] For a detailed analysis of art price formation and price determinants on the primary market see e.g. Velthuis (2001, 2003b, 2005), Rengers and Velthuis (2002), Sagot-Duvauroux et al. (1992), Schönfeld and Reinstaller (2007). For more information on determinants of art prices on the dealer market see e.g. Hutter et al. (2007).

[28] Hutter et al. (2007) point to the mutual influences with regard to the price levels on the dealer and auction market. Candela and Scorcu (2001), and Velthuis (2005) suggest that, in general, galleries and art dealers use auction prices as benchmarks.

3.2.1. Size

Size (dimensions) and surface of an artwork are among the most commonly named factors affecting art prices[29]. Even though size effects differ across media, a common finding of many studies is that prices are positively correlated with size. However, there seems to be a critical dimension beyond which prices increase at a decreasing marginal rate (Sagot-Duvauroux, 2003). This is due to the fact that private and corporate buyers, unlike museums, are constrained in their choice by the size of the walls in the apartments and offices, and prefer works of 'reasonable' size. Therefore, demand for the biggest paintings is usually restricted to cultural institutions, which are able to display them (Frey and Pommerehne, 1989b).

3.2.2. Medium, technique and support

Most studies investigate the impact of artwork's physical properties (such as medium, materials, support and technique) on the price with regard to paintings. The common conclusion is that, on average, oil works are the most expensive, as compared to e.g. watercolors, tempera or acrylic paintings. The same applies to works executed on canvas, which are priced higher than works on panel, board or paper. As a result, oil on canvas is valued the most[30]. This can be explained by its greater durability, superior skills required for execution, as well as broader spectrum of artistic effects it allows for (Sproule and Valsan, 2006). Finally, in general, paintings are more expensive than drawings, and the latter are valued higher than prints[31]. From the historical point of view, this might be perceived as a result of differences in production costs. However, nowadays, discrepancies in prices between various media and techniques reflect rather buyers' preferences (Sagot-Duvauroux et al., 1992).

[29] However, Rengers and Velthuis (2002) argue that differences in size do not explain differences in prices across artists, only within the particular artist's oeuvre.

[30] However, Kräussl and van Elsland (2008) find that, on average, oil works on panel are priced higher than oil works on canvas.

[31] This is also a result of the multiple nature of prints (they are made in editions), as well as different degrees of 'proximity' of the states to the creator (Sagot-Duvauroux et al., 1992).

3.2.3. Subject

Subject matter affects prices. However, its effect cannot be generalized, for it differs across various artists, time periods, buyer types, markets, etc. Nevertheless, some subjects are preferred by buyers, which is, in turn, reflected in higher prices (Ginsburgh and Schwed, 1992). The impact of this variable on prices is strongly influenced by other factors, such as widespread tastes and fashions, expert opinions, or buyer's nationality[32]. In general, as pointed by Sproule and Valsan (2006), due to difficulties in translating this variable into qualitative terms, the overall effect of subject matter on prices is hard to capture and measure. Finally, Sagot-Duvauroux et al. (1992) argue that definition of subject has changed over time, and, with reference to contemporary art, it is no longer of great importance for art price formation. This view might be supported by the findings of Anderson (1974) and Wieand et al. (1998), who observe that this factor has little impact on the hammer price.

3.2.4. Condition

The overall condition of an artwork can influence its price. According to Singer and Lynch (1997), poor condition may result in a price reduction of up to 80 per cent. In general, better preserved artworks should be valued higher. However, even though poor condition of a superior-quality artifact will not be, most probably, reflected in its price, it might be of substantial importance in the low end of the market (ibid.). The problem with reaching any conclusions on this matter is that data on the state of preservation is hard to obtain and verifying artwork's condition would imply its visual examination.

3.2.5. Attribution

Attribution emerges from a consensus on the nature, origin, creator and date of execution of a particular artwork that is reached by experts. Its impact on the price is best illustrated by the fact that changes in attribution are always followed by adjustments in the price. The direction, in which the market value will change, depends ultimately on the reputation and standing of both the previous and newly established creator of a given work. Moreover, attribution may be accompanied by a certain degree of uncertainty, which is

[32] In many countries, certain subjects are favored by domestic buyers. See e.g. Valsan (2002) for an overview of Canadian buyers' preferences.

discounted in the monetary valuation of the artwork (Savage, 1969). This is of particular importance on the market for Old Masters, which were often created in artists' workshops and only signed by the master. Therefore, there exists a 'hierarchy' of degrees of attribution, which affect the hammer price to a varying extent[33].

3.2.6. Authenticity and signature

Authenticity[34], a variable that reflects the value of originality and novelty of the artist's oeuvre, is one of the major factors affecting art prices. This is reflected in the fact that once artwork's genuineness is questioned, a substantial drop in its market valuation can be observed (Sagot-Duvauroux et al., 1992). Therefore, some authors (e.g. Renneboog and Van Houtte, 2002) conclude that a signature positively affects the price, as it is commonly perceived as a proxy for artwork's authenticity. Moreover, a visible signature may provide the owner with consumption and prestige benefits (Czujack, 1997). However, it could be equally argued that a signature might be forged, and thus artwork's authenticity can be proved only through expertise[35]. Therefore, some authors (e.g. ibid.) do not identify any effect of signature on the price. This may be due to the fact that a signature matters more in the low end of the market, since it serves as the only proxy for artwork's authenticity, whereas the genuineness of superior-quality artifacts can be determined even if they are not signed (Ursprung and Wiermann, 2008).

3.2.7. Provenance

The question whether artwork's provenance has a significant impact on the price is still open to debate. It can be argued that prestigious provenance can be interpreted as a proof of superior quality and authenticity of an artwork, and thus positively affect its price (de la Barre et al., 1994). It may also reduce the risk that its quality will be negatively verified by art history, which would result in a future loss of value (Landes, 2000). Moreover, esteemed

[33] Those include: 'work by' ('signature of') (work was executed by the artist herself), 'attributed to' (work may have been wholly or partly created by the artist), 'studio (workshop) of' (work was executed in artist's workshop under her supervision), 'school of' (work was created by a pupil or follower of the artist up to 50 years after her death), 'in the style (manner) of' (attribution is dubious) (Sagot-Duvauroux, 2003).

[34] 'Authenticity' should be distinguished from 'originality'. The former implies that the artwork was created by the artist it is attributed to, whereas the latter refers to artistic innovation and invention (Lazzaro, 2006).

[35] Artworks with proven authenticity are registered in catalogue raisonné. However, this does not totally eliminate the risk of misattribution. In the contemporary market segment, artwork's authenticity is confirmed by certificates obtained from painters, galleries or art dealers.

provenance might reconfirm the buyer's aesthetic judgment (Plattner, 1996). Finally, previous owners' high reputation may be a source of prestige and status benefits for the buyer (Landes, 2000). International auction houses seem to share this point of view, since they include information on past owners in the pre-auction catalogues. A study by Landes (ibid.) on the sale of the Ganz collection supports the impact of this variable on the hammer price. Author's findings indicate that works belonging to the renowned collectors' couple fetched above-average prices. However, this considerable 'celebrity premium'[36] could be equally attributed to connoisseurship and superior knowledge that enabled them to compose the collection only of the top-quality works (ibid.). Moreover, the positive effect of provenance on the price could be also a result of auction house's promotional efforts and media hype surrounding the sale. On the other hand, based on her findings, Czujack (1997, p.239) concludes that 'prestigious provenance hardly matters'.

3.2.8. Time of creation

Time of creation is an important factor for several reasons. First of all, it may be correlated with artwork's genre and style. Secondly, it is also associated with the artistic period, in which the artist was active when she executed the work – time of top achievements and greatest innovations, or rather artistic indolence and misconceptions[37]. All those aspects may be, in turn, reflected in the price (Anderson, 1974). Some studies (e.g. Ursprung and Wiermann, 2008) identify the effect of the period of creation on the price. However, similarly to subject matter, there is no general pattern, in which this variable influences art prices, since it is closely related to other factors, such as tastes and fashions.

[36] Pesando and Shum (2007) refer to it as 'irrational exuberance'.
[37] For example, for a selected group of artists, de la Barre et al. (1994) observe substantial differences in prices fetched by works executed at different points in artists' careers.

3.2.9. Rarity and scarcity[38]

Although it might seem that artworks typical for a particular artist should fetch higher prices, since buyers might rather want to own something representative for her oeuvre, this is not necessarily the rule. If artworks are rare in style, subject matter, medium, etc., but at the same time their quality is not inferior, scarcity may positively affect prices.

3.2.10. Artwork's history

Many events in artwork's history can positively influence its price. Those include, among others: taking part in domestic and international exhibitions, being mentioned in art literature and academic publications, remaining in major public or private collections, being considered a part of national heritage. In general, the number of exhibitions and publications the work appeared in is positively correlated with the price (Wieand et al., 1998). The same applies to touring exhibitions, which, by reaching a wide audience, have a promotional effect (Czujack, 1997). However, it might be equally argued that works of superior quality are shown or discussed in the literature more often. Therefore, the fact that they command higher prices may result from greater artistic quality, rather than higher number of exhibitions or publications (ibid.).

3.2.11. Artistic quality

This variable is probably the most important among artwork-related aspects (Anderson, 1974). It implies a subjective collective judgment of the members of the art world, which is verified in the course of history. Sagot-Duvauroux et al. (1992) argue, however, that in determining artistic quality, a set of objective factors such as harmony, homogeneity and subject matter, are taken into account. Expert valuations serve as guideposts for prospective buyers and are reflected in art prices. Finally, since a layman might find it difficult to evaluate

[38] Rarity and scarcity refer also to the supply side. Scarce works may be valued higher on average, since their limited supply can enhance buyers' willingness to pay (Czujack, 1997). According to Ursprung and Wiermann (2008), and Lazarro (2006), a significant increase in supply might lead to a decline in price, although this effect is not very large. Moreover, Sagot-Duvauroux et al. (1992) claim that the impact of scarcity on prices is positively correlated with artist's fame. Finally, growing scarcity of works within a particular market segment, especially in the lower end of the market, might lead to an increase in prices of works considered close substitutes (ibid.). Low supply may be caused by many factors, e.g. artist's or art dealer's conscious strategy (ibid.), or cultural institutions' reluctance to deaccession works created by a given artist.

artistic quality, it needs to be ascertained by experts that are credible to the public. They, in turn, lend their credibility to the artist's oeuvre (Bonus and Ronte, 1997).

3.2.12. Past prices and reference dependence ('anchoring effect')

Some authors (e.g. Beggs and Graddy, 2007) suggest that, in making their valuations of a particular work, bidders may be strongly influenced by its previous hammer price (so called 'anchoring effect' or reference dependence[39]). Moreover, 'anchoring effect' may also appear on the auction house's and seller's side, and affect both pre-sale price estimates and reserve prices[40]. This could, in turn, have an indirect impact on the hammer price, or even influence artwork's future market value (see section 3.4.6.2.2.Strategy and pre-auction price estimate (bias) and 3.4.6.1.1.Reserve price).

3.3. Artist-related factors

According to Velthuis (2005), this group of factors plays a more important role in art price formation than artwork-specific variables. As already mentioned, it is due to a historical process, as a result of which an ever increasing attention is being paid to individual artists, rather than particular artworks. However, whereas artist's name, reputation and standing are all significant determinants of art prices, other aspects, such as age, nationality or gender seem to be of lesser importance.

3.3.1. Reputation and standing

Among artist-related factors, artist's reputation and standing seem to have the strongest impact on art prices (Frey and Pommerehne, 1989b). Similarly to artistic quality, they are determined by art experts, whose opinions are verified in the course of history. Those collective judgments are based on many aspects, such as artistic quality of the oeuvre, its innovation and originality, but also artist's past achievements and career. Opinions formed by members of the art world (art dealers, gallery owners, art critics, curators, directors of cultural institutions, etc.) are then disseminated through art literature, scholarly publications and

[39] Even though those terms are usually used interchangeably, Beggs and Graddy (2007) underline that their meaning is slightly different.

[40] However, Beggs and Graddy (2007) argue that the path-dependent nature of pre-auction price estimates could be also interpreted as experts' response to the 'anchoring effect' on the bidders' side.

media. They can materialize, for example, in the form of artists' rankings (e.g. *Kunstkompass*[41])[42].

3.3.2. Art historical significance

This factor is closely related to artist's reputation and standing, and is determined by artistic merit and innovativeness of a particular artist, artistic group or movement (especially its formative years) (Singer and Lynch, 1997). Its impact on art prices is supported by the findings of Singer and Lynch (ibid.), who discover significant discrepancies in market valuations of works created by innovative artists and their followers. Art historical significance is reflected in many ways, e.g. in the number of art historical publications mentioning an artist, collections or exhibitions featuring her works, museum acquisitions, etc.

3.3.3. Fame

Whereas artist's reputation and standing are determined by experts' judgments, fame can result from art dealers' and auction houses' promotional activities, or wide media coverage. However, in contrast to reputation and standing, fame does not always go in line with artistic quality and can be equally attributed to e.g. extravagant lifestyle, or controversies surrounding artist's life and her oeuvre. Nevertheless, in some cases it might assure an artist a place in the history of art (Sagot-Duvauroux, 1992).

3.3.4. Achievements

Past group and solo exhibitions, prizes and awards, domestic and international publications, grants and scholarships, commissions by government bodies and cultural institutions, etc. may be interpreted as signs of artistic quality, and thus contribute to artist's

[41] An annual ranking of top 100 visual artists compiled from 1970 by the late German journalist Willi Bongard and published in the November issue of the business magazine *Capital*. Since 1986, Bongard's work has been continued by his wife, Linde Rohr-Bongard (Velthuis, 2005).

[42] Thus far, several ways to measure artist's standing and reputation have been proposed. Some (e.g. Anderson, 1974) rely on auction prices. Other use more qualitative measures. For example, a method suggested by Galenson (1999) is to count the number of times an artist's work has been reproduced in art historical literature. Another way proposed by Willi Bongard in *Kunstkompass*, is to weigh and attach numerical values to the number of reviews and articles devoted to an artist, works acquired by public museums, as well as group and solo exhibitions featured in according to their importance, and then translate the aggregate figures into ranks (Velthuis, 2005).

reputation and success. They also serve as guideposts for potential buyers, who, in order to economize on information and search costs, often concentrate their demand only on artists selected by experts and cultural institutions (Velthuis, 2005). Therefore, the number and importance of achievements is generally positively correlated with demand and, consequently, art prices (Plattner, 1998). Finally, it should be noted that whereas grants and scholarships can be treated as signs of institutional recognition, they have also an impact on the supply side. Therefore, the evidence on the influence of this variable on art prices is mixed (Rengers and Velthuis, 2002). Moreover, Bonus and Ronte (1997) argue that the number of exhibitions and prizes awarded to an artist is not correlated with art prices, since it is their significance, rather than the number, that may affect the market valuation of artist's works.

3.3.5. Nationality

In general, artist's nationality should not be correlated with the price level, since it is not related to artistic quality. In most cases (e.g. Schneider and Pommerehne, 1983), authors fail to identify any impact of this variable on art prices. However, de la Barre et al. (1994) discover a relationship between artist's nationality and market valuation of her works, although this might be also associated with the criterion the authors have chosen for constructing the underlying sample. Nevertheless, nationality might matter in so far as it is sometimes linked with the artistic period, movement or school an artist was active in. Therefore, as a result of current fashions or buyers' tastes, works created by artists of particular nationality may sometimes fetch higher prices[43]. Moreover, as suggested by Velthuis (2005), buyers might be willing to pay more for works of a foreign artist, since her appearance on the national market may be interpreted as a sign of international success. Finally, artist's nationality may play a role in relation to the country of sale. Due to some country-specific characteristics or conformity with the common tastes, works created by artists of particular nationality may be appreciated more by domestic buyers and thus fetch higher prices, if auctioned on the domestic market.

[43] See e.g. Valsan (2002) on differences in prices between American and Canadian paintings.

3.3.6. Age and creativity patterns

Artist's age plays a role in art price formation in a number of ways. First of all, some authors (e.g. Agnello and Pierce, 1996) identify a non-linear relation between artist's age at the time of sale and artwork's price. This can be a result of buyers' willingness to pay more for works created by older artists, since they might be perceived as more experienced and their art as having superior-quality. Furthermore, longer presence on the art market might have allowed an artist to become more recognized and thus increase the demand for her oeuvre (Velthuis, 2005). Secondly, artist's age at the time of execution is related to the artistic period, school or movement, as well as subject matter and artistic quality. In his various papers, Galenson[44] investigates the relationship between artist's age at the time of execution and hammer price for different artistic movements and periods. He argues that creativity patterns vary across particular market segments[45]. Therefore, since artists produce works of highest quality at various points in life, age at which an artwork was created can partly account for price differences. In addition, artist's age at the time of sale may influence buyers' expectations on the total supply of her oeuvre. On the one hand, higher probability of artist's death (an event that would fix the supply and assure potential buyers that an increased production will not depress prices in the future) could stimulate the demand side and positively affect the price of her works (Ekelund et al., 2000). On the other hand, it might be argued that the market discounts the conditional life expectancy in the price. Therefore, greater probability of death resulting from growing age should not (significantly) enhance the price level (Kraüssl and van Elsland, 2008). Finally, age at the time of death may also have an impact on the price (see section 3.3.7.'Death effect').

3.3.7. 'Death effect'

In some cases, authors (e.g. Czujack, 1997) identify the so called 'death effect', i.e. an immediate increase in prices following artist's death. When the artist dies, the supply of her works becomes fixed. Therefore, buyers become certain that potential (over)production will not depress future prices. This can, in turn, stimulate demand (also as a result of speculative purchases) and thus put an upward pressure on prices (Ekelund et al., 2000). On the other

[44] For more details see e.g. Galenson (1999, 2000, 2004), Galenson and Jensen (2001), Galenson and Weinberg (2000, 2001).
[45] The issue of creativity patterns is also analyzed by Edwards (2004) in a study on Latin American art.

hand, during the lifetime, an artist may be able to further enhance her reputation or adjust the style to current trends, which could result in higher market valuation of her oeuvre[46] (Agnello and Pierce, 1996). Therefore, some authors (e.g. Buelens and Ginsburgh, 1993) conclude that the evidence on the impact of artist's living status at the time of sale on the price is mixed, or even question its significance (e.g. Kräussl and van Elsland, 2008). In their recent study, Ursprung and Wiermann (2008) shed new light on this issue. They associate death-induced price changes with artist's age at the time of death and find an inversely U-shaped relationship between both factors[47]. Moreover, the authors argue that the absolute magnitude of the 'death effect' depends on the artistic quality of the deceased artist's oeuvre.

3.3.8. Gender

Works executed by female artists are found to be valued lower on average (Velthuis, 2005). Although this gender-induced price gap has been identified with reference to the primary market, a closer look on various artists' rankings supports the view that female artists are generally priced lower than their male counterparts. However, the question whether differences in prices between artworks of equal quality are partly determined by differences in creators' sex still remains to be researched. Rengers and Velthuis (2002), for example, argue that part of the price gap between both sexes can be explained by differences in age and career patterns.

3.4. External factors

3.4.1. Experts

Experts' influence, even though often indirect, is probably the most significant factor affecting art prices. Judgments and choices made by credible critics, curators, directors of cultural institutions, etc. who serve as gatekeepers and legitimizing bodies, determine artists' reputations and careers, but also shape buyers' tastes and preferences. Their opinions, based

[46] This argument is questioned by Ekelund et al. (2000), who underline that it refers rather to the supply side, whereas the 'death effect' occurs on the demand side.

[47] On the one hand, an untimely death of a promising artist may reduce demand and therewith prices of her oeuvre, since buyers can no longer expect the artist to build up her reputation. This reputation-driven negative effect on prices diminishes, however, as the artist's career progresses and finally totally disappears. Beyond certain critical age, a positive 'death effect' resulting from the supply being fixed sets in, which, as already mentioned, puts an upward pressure on prices. This scarcity-driven effect also approaches zero together with the decreasing life expectancy.

on artistic quality, merit and past achievements, are disseminated through media, publications, rankings, exhibitions, etc. Experts' judgments serve, in turn, as reference points for buyers, who may find it hard to assess artistic quality and, in order to minimize the risk of acquiring poor-quality art, seek reassurance of their aesthetic valuations (Plattner, 1998). Moreover, buyers may rely on experts so as to economize on information and search costs (Sagot-Duvauroux, 2003). This concentration of demand on a limited number of selected artists further enhances their renown (so called 'superstar phenomenon'[48]) and contributes to an increase in prices of their oeuvre (Velthuis, 2003a). And even though fashions and fads might arise irrespective of experts' opinions, and some talented artists can remain unrecognized by the art world for a long time (Vincent van Gogh being the most notable example), those judgments are usually positively verified by art history.

3.4.2. Fashions and tastes

Changing fashions and tastes result in price fluctuations on the art market. Besides experts' opinions, they are another decisive factor that guides buyers' choices. Due to changing preferences and fads, a large part of artistic output becomes obsolete over time (Grampp, 1989). In general, a fall from fashion translates into a drastic price decrease. This is reflected particularly well in the historical rises and falls of markets for certain types of art (e.g. 18th century English paintings), or particular artists (e.g. Sir Lawrence Alma-Tadema) (Frey and Pommerhne, 1989a). Moreover, buyers' changing preferences result in a high price volatility and uncertainty on the market, which, in turn, puts the potential predictability of art prices in question (Baumol, 1986). On the whole, a favorable shift in buyers' tastes or appearance of a new trend leads to a significant increase in prices in a given market segment.

3.4.3. Economic factors

3.4.3.1. State of the economy

This variable refers to the state of the economy at the national, as well as global level. Whereas periods of boom on the art market and within the economy as a whole do not necessarily have to occur simultaneously, they do overlap. Art, similarly to e.g. luxurious

[48] For more details see e.g. Adler (1985), Rosen (1981), Towse (1997) and Schulze (2003).

goods, is purchased only when other, more basic needs are satisfied, and is one of the first commodities to be sold during economic downturns, especially with regard to lower-quality artworks (Mamarbachi et al., 2008). Therefore, times of boom on the art market may proceed with a certain time lag, and art slumps can set in only at the onset of the economic recession. Although, in general, increasing economic growth should be followed by higher art prices, the overall effect is not always easy to forecast (Sagot-Duvauroux et al., 1992). On the one hand, it can stimulate demand and supply as a result of buyers' increasing wealth and sellers' expectations of future growing prices. On the other hand, it may reduce demand for art due to greater attractiveness of some alternative forms of investment (Frey and Pommerehne, 1989b). It may be argued, however, that the latter effect applies only to art investment-oriented buyers and has thus a limited impact on art prices.

3.4.3.2. Correlation within the art market and with other markets

Several authors (e.g. Ginsburgh and Jeanfils, 1995) examine the relationships between particular market segments and observe a strong correlation in price movements across various sub-markets. Moreover, art prices seem to be influenced by market valuations of high-end works, which act as an exogenous price determinant (for more details see chapter 4 Art investment, section 4.4.Portfolio diversification and optimal portfolio). Various studies also investigate the correlation between the art and other markets, such as stock or real estate market (for more details see chapter 4 Art investment, section 4.3.Correlation with other markets). Whereas some authors fail to identify any relationship, others argue that art prices may be influenced by prices of other commodities, financial instruments or real estate. Those simultaneous or lagged co-movements could be explained by the overall impact of economic trends on price levels in general (Wieand et al., 1998). Moreover, since booming economy is often accompanied by bull stock market, growing share prices might imply an increase in art prices. It is because a part of the gains made on the financial markets might be allocated into art (Chanel, 1995). On the other hand, individuals driven by pure investment motives could be deterred from purchasing an artwork, if alternative forms of investment offer higher returns (which is often the case during bull markets).

3.4.3.3. Inflation

It is argued that artworks are one of the best stores of value, since they retain real value in the long run and can thus serve as a hedge against inflation (Frey and Pommerehne, 1989b). This would imply that in times of high inflation, demand for art and, therewith, art prices should rise. However, evidence on the hedging potential of art, and correlation between art prices and inflation is mixed. Whereas Campbell (2004) argues that artworks can serve as a good inflation hedge, Renneboog and Van Houtte (2002) conjecture the opposite. Therefore, the role of this variable in art price formation remains uncertain.

3.4.4. Legislation and tax regulations

In general, changes in legislation may have an indirect impact on the demand and, therewith, art prices. For example, favorable tax regulations can attract buyers and thus contribute to price increases. Especially in the U.S., tax benefits associated with donations to cultural institutions may play some role in art price formation. This, however, does not apply to most European countries (Plattner, 1996).

3.4.5. Buyers[49]

3.4.5.1. Type

Many authors (e.g. Chanel et al., 1996) argue that prices may vary according to the buyer's type[50]. This interrelation is a result of differences in behavior, purchase motives, valuations, art historical knowledge, information sets regarding an artwork, and responsiveness to changing market conditions (e.g. risk, costs, taxes) (Frey and Eichenberger, 1995). Especially public museums' purchases might generate above-average hammer prices (Pommerehne and Feld, 1997). Pommerehne and Feld (ibid.) explain this phenomenon by the tendency of public institutions (located mostly outside the U.S.) to ignore the opportunity costs, which is a result of lower budget constraints and lesser external control over their purchases, relative to their U.S. private counterparts. Moreover, in general, museums' demand

[49] The impact of buyers' and sellers' characteristics on art prices is observed by i.a. Sagot-Duvauroux et al. (1992).

[50] Among different types of buyers, one can name: collectors, investors and speculators, as well as private, corporate and institutional buyers.

is highly inelastic, since it is concentrated only on particular top-quality works. Another explanation provided by Singer and Lynch (1997) is that public museums tend to buy at the top of the demand curve – i.e. they purchase artworks only when having gathered all relevant information, which minimizes the risk, but also results in a price premium paid. It is due to the fact that acquisitions made by public institutions are subject to many constraints and are scrutinized by the relevant government bodies (Frey and Eichenberger, 1995). Furthermore, Velthuis' (2005) findings suggest that prices paid by museums affect the general price level of works within the artist's oeuvre. This is because institutional recognition serves as a proxy for artistic quality, enhances artist's reputation and thus stimulates demand. It should be, however, noted that the positive effect of a museum purchase on the hammer price refers mainly to the high end of the market (Pommerehne and Feld, 1997). In addition, museum acquisitions, but also purchases made by famous collectors, can create new fashions and influence buyers' tastes, which may contribute to price increases[51]. Finally, it can be argued that the hammer price may also depend on the information set possessed by the prospective buyer. Due to information asymmetry prevalent on the art market, the usually less well-informed individual buyers may be prepared to pay a price premium, as compared to better informed art dealers, or individuals having expert or insider knowledge (Singer and Lynch, 1994). Moreover, as a part of gallery's or art dealer's strategy to maintain a certain price level for their artist's works, as well as to avoid unfavorable price differences between the primary, secondary and tertiary market, auction prices might be inflated by the demand of those buyers (Sagot-Duvauroux et al., 1992).

3.4.5.2. Nationality

The impact of buyers' nationality on art prices becomes clear when considering the fact that, in times of boom, demand is often driven by buyers of a particular nationality. This was, for example, the case in the end of the 1980s and beginning of the 1990s when extraordinary prices of Impressionist paintings resulted mostly from Japanese, often speculative, purchases[52]. It is also the case today, with the ever growing demand coming from Russian, Chinese and Indian new rich classes. Since their choices are often uninformed,

[51] For example, acquisitions made by the advertising magnate and renowned collector Charles Saatchi in the beginning of the 1990s sparked a new fashion for a group of artists known as Young British Artists (YBAs), i.a. Damien Hirst, Tracey Emin, Jenny Saville, Jake and Dinos Chapman, Marc Quinn. Moreover, his strategy of buying up a large part of a young artist's oeuvre enabled him to exert a quasi-monopoly over her works and restrict their supply, which further inflated the prices.

[52] For more details see e.g. Hiraki et al. (2005).

driven by either speculative or patriotic motives (Mamarbachi et al., 2008), virtually any price level is accepted. This does not only increase prices in particular market segments, but also attracts speculators who want to profit from the emerging trends and fashions, and thus put an upward pressure on art prices.

3.4.5.3. Wealth

Buyers' wealth, a variable correlated with the overall state of the economy, is one of the decisive factors affecting the demand side and, therewith, prices (Schneider and Pommerehne, 1983). However, it may be argued that the increasing prosperity of potential buyers can affect prices in the higher end of the market to a greater extent, relative to other market segments.

3.4.5.4. Behavior at auction

Although most buyers enter the auction with some assumptions as to their willingness to pay (based on i.a. past prices and price estimates published in the pre-auction catalogues, experience, art historical knowledge, available financial means), the hammer price might be an outcome of their emotional, rather than rational behavior. Under the influence of other auction participants' bids, valuations might change as the auction proceeds. Therefore, the final price might be contingent on the '"excitement" of a single night' (Velthuis, 2005, p.84). Competitive behavior at an auction, resulting from bidders' desire to acquire a certain artwork, may inflate the hammer price. As noted by Moulin (1994), the price is a result of the presence (or absence) of particular individuals with certain valuations and financial means, determined to own an artifact. The fact that the buyer pays a certain price does not mean she would not be prepared to pay more, were she overbid by an individual with a higher willingness to pay.

3.4.5.5. Number

Some authors (e.g. Sagot-Duvauroux et al., 1992) suggest that the number of bidders present at the auction may be positively correlated with the hammer price. This might be explained by the fact that a higher number of potential buyers might stimulate competitive behavior, which may translate into a higher final bid. However, the effect of this variable on

the price is argued to depend on the bidders' type – it is positive only if bidders have independent private values[53] (Pesando, 1993).

3.4.6. Sellers[54]

3.4.6.1. Owner

As already mentioned, previous owner's name and reputation can positively influence art prices (see section 3.2.7.Provenance). However, there are some other seller-related aspects that can affect the price of an artwork.

3.4.6.1.1. Reserve price

Even though the reserve price is an outcome of negotiations between the seller and auction house, the final decision on its magnitude belongs to the owner of the artwork. The level, at which the reserve price is set, has twofold consequences. First of all, it determines whether the auctioned object gets sold, or (if the hammer price does not reach the reserve price) is 'bought in' by the auction house. The latter event may, in turn, have a negative impact on the valuations of prospective buyers and result in the so called 'burned painting' anomaly (for more details see chapter 5 Return factors, section 5.2.4.5.'Burned painting' anomaly). Secondly, it can indirectly influence the hammer price, as it is usually correlated with the lower bound of the pre-auction estimate[55], which, in turn, serves as a reference point for potential buyers (see section 3.4.6.2.2.Strategy and pre-auction price estimate (bias)). Since it is a common practice among major auction houses to set the pre-sale estimate equal to or above the reserve price, by being able to negotiate a higher reserve price, seller might affect the estimate and thus have an indirect impact on the hammer price (Candela and Scorcu, 1997).

[53] This means that bidders' valuations are not influenced by valuations of other auction participants.

[54] Since the center of my focus is the auction market, I introduce only the variables related to the owners and auction houses. However, it should be noted that characteristics of galleries and art dealers may play an equally important role in art price formation.

[55] It is estimated that the reserve price amounts to about 70-80 per cent of the lower bound of the pre-sale price estimate (Ashenfelter and Graddy, 2006).

3.4.6.1.2. Time of sale and holding period

The decision to sell a painting at a particular point in time may be determined by many factors, such as: expected price, state of the economy, situation on the art market, seller's financial situation, etc. Timing is of importance not only with reference to the overall state of the economy and situation on the art market (i.e. boom versus downturn period), but also time of the year. This is because, due to seasonality of sales, each auction market has its own business cycle. Therefore, depending on the month of sale, artworks may be bought at a discount or premium (Wieand et al, 1998). However, contrary to expectations, Agnello (2002) observes that whereas prices of works sold during top auction seasons are highest on average, stagnant periods are not associated with lowest prices. However, this finding refers to the most renowned international auction houses present on the U.S. market and might not necessarily apply to other national markets. Moreover, time of sale defines also the overall holding period (i.e. time that has elapsed since the last sale of the artifact). Some authors suggest that it may have an impact on the price. In particular, a decision to resell within a short period of time might result in a loss of value (so called 'winner's curse'). Czujack's (1997) findings seem to support this view. However, Goetzmann and Spiegel (1995) find no evidence for the existence of this phenomenon (for more details see chapter 5 Return factors, section 5.2.1.Holding period, timing and 'winner's curse').

3.4.6.2. Auction house

3.4.6.2.1. Name and location (violation of the 'law of one price')

Economic theory assumes that, on a competitive and efficient market, prices for a certain good are a result of the market equilibrium. If price differences occur, they do not last long, for they are evened out by arbitrage (Velhuis, 2005). However, empirical evidence suggests that the 'law of one price' does not hold for the art market[56]. Many authors observe systematic differences in prices obtained for the same or similar[57] works sold at different

[56] The 'law of one price' implies that, in the absence of different transaction costs, as well as trade and other barriers, no systematic price discrepancies between distinct markets can be observed (Ashenfelter and Graddy, 2006; Pesando and Shum, 2007).

[57] By similar works I mean prints from the same edition, which are of comparable quality.

auction houses[58] (with greatest price premiums paid for works sold at Sotheby's and Christie's), in distinct cities or geographic regions. It could be argued that each auction is unique and thus the same object sold within a short period of time may fetch different prices. Moreover, those discrepancies could be attributed to differences in the lot ordering (see section 3.4.8.Anomalies), 'winner's curse', information asymmetry prevalent especially in the low end of the art market, or buyers' willingness to economize on search costs. The positive effect of major auction houses on the hammer price could be also explained by the selective manner in which they accept objects for sale. In addition, their reputation and top-quality offer might enhance buyers' valuations (Sproule and Valsan, 2006). Finally, auction houses' promotional efforts could also attract a larger number of wealthy bidders, which might, in turn, increase the hammer price (Landes, 2000). It should be, however, noted that the impact of the auction house on the price may vary across different sub-markets. For example, Czujack (1997) finds systematic differences in price levels only between the countries, but not particular salerooms. However, Ekelund et al. (2000) do not identify any relationship between the auction house and price of Latin American art (for more details see chapter 5 Return factors, section 5.2.4.3.Violation of the 'law of one price').

3.4.6.2.2. Strategy and pre-auction price estimate (bias)

Auction houses may exert indirect influence on the hammer price in various ways. First of all, as observed by Agnello (2002), artworks illustrated in the pre-auction catalogues may fetch higher prices. However, it could be equally argued that the choice to reproduce a photo of a particular artifact in the catalogue may be guided by its superior quality, which is, in turn, positively correlated with the price. An auction house may also affect the hammer price through the lot ordering (see section 3.4.8.Anomalies). Moreover, a diversified offer at a particular auction might stimulate demand and have a positive effect on the prices fetched (Candela and Scorcu, 1997). Finally, auction houses might be able to indirectly influence hammer prices through pre-auction price estimates (Ashenfelter and Graddy, 2003). Since experts' appraisals may serve as reference points for credulous bidders ('anchoring effect' or reference dependence), their increase might positively affect their valuations (Beggs and Graddy, 2007). For example, Mei and Moses (2002a) observe that an upward bias in pre-auction estimates has a positive effect on hammer prices. On the other hand, Czujack (1997)

[58] For more details on the efficiency of auction houses, and the relationship between the auction house and hammer price see Førsund and Zanola (2001, 2002, 2006).

does not identify any link between the pre-sale estimates and auction results. Moreover, the evidence on the existence and direction of the pre-sale estimate bias is mixed (for more details see chapter 5 Return factors, section 5.2.4.4.Pre-auction price estimate bias). Even if auction houses make systematic mistakes in their predictions, the question remains whether this can be attributed to their strategic behavior.

3.4.7. Media

By focusing on certain aspects (e.g. auction records, works and careers of young emerging artists), wide media coverage can enhance demand and contribute to price increases in particular market segments (Lourgand and McDaniel, 1991). By selectively highlighting some artists, artistic movements, exhibitions, publications, etc. media may influence tastes, create fashions and determine artistic careers. Media coverage can also reinforce promotional efforts of galleries, art dealers, auction houses, some famous collectors or artists.

3.4.8. Anomalies[59]

Similarly to e.g. January-, Holiday-, Christmas- or Small-firm-effect encountered on the financial markets, art market-specific anomalies might have an impact on art prices (Frey and Eichenberger, 1995). Besides the 'winner's curse' and violation of the 'law of one price', one should also mention the so called 'declining price' anomaly ('afternoon effect') and 'morning effect'. Both phenomena indicate that the lot ordering and lot number might affect hammer prices. The former implies that the hammer prices, as well as hammer prices relative to the corresponding pre-sale estimates are more likely to fall than to rise towards the end of the auction. This could be a result of a smaller number of bidders (i.e. lower competition) present as the auction proceeds, auction houses' strategy to order objects by date of creation or appraised value (in a declining manner), buyers' risk aversion, or biased pre-auction price estimates[60] (Beggs and Graddy, 1997). The latter phenomenon has the reverse effect and may be explained by the affiliated values of bidders[61] (Picci and Scorcu, 2003). It should be noted that, in general, more studies identify the existence of the 'declining price' anomaly (e.g. Agnello and Pierce, 1996; Pesando and Shum, 1996).

[59] For more details see chapter 5 Return factors, section 5.2.4.Anomalies.
[60] However, Pesando and Shum (1996) suggest that it might be also due to unobserved differences in quality.
[61] Bidders' values are affiliated (or common) when bidder's valuation of the object is correlated with valuations of other auction participants (Keser and Olson, 1996).

As art price formation is a very fine-grained and complex process, the list of art price determinants encompasses probably even more aspects. However, I do believe that the most important factors have been introduced in this chapter. It should be also noted that many of them play also an important part in determining the financial performance of art.

4. Art investment

4.1. Introduction

Financial performance of art as an alternative asset class has been the center of focus of most studies on art investment. As already outlined in the first chapter, if conclusions were to be drawn based solely on the obtained rates of return, a rather unfavorable picture emerges. However, monetary appreciation of an artwork purchased at auction directly by an individual is only one of the possible sources of potential benefits to the owner. Fairly low average returns on art, relative to other asset classes, do not necessarily imply that artworks should be considered an unattractive form of investment.

In this chapter, I examine art's potential from the investment perspective. First, I focus on art price indices, which are indispensable tools for measuring financial performance of artworks. In the following two sections, I analyze the relationship between the art market and other markets, in particular the market for equities and real estate. Next, artworks' capacity for diversifying risk in a market portfolio and composition of the optimal art portfolio are discussed. Finally, I present different forms of art investment, and point to their weaknesses and strengths.

4.2. Art price indices[62]

In order to answer the question whether art is a good investment, an art price index should be first developed. The major motivation behind construction of art price indices is (Ashenfelter and Graddy, 2006; Ginsburgh et al., 2006):

- to measure financial performance of art, relative to other alternative forms of investment
- to check whether adding art to a diversified market portfolio can lower the overall risk and/or increase the rate of return
- to outline general trends on the art market

Artifacts possess several characteristic features that distinguish them from traditional financial assets and complicate the process of measuring their monetary performance. As artworks are unique, heterogeneous goods, traded infrequently (with the only publicly available data coming from auctions) and illiquid (it takes approximately 3-6 months before

[62] For more details on art price indices and measurement methods see Ginsburgh et al. (2006) and Fase (2001).

an artwork can be sold at an auction), constructing a price index is more problematic than in the case of homogeneous stocks or standardized commodities traded on organized markets. In order to omit those obstacles, several methods of constructing art price indices have been proposed. In general, most studies apply one of the first two approaches, i.e. hedonic or repeat-sales regression. In the following section, I shortly describe each method, and point to their weaknesses and strengths[63].

4.2.1. Repeat-sales regression

This method considers only those works that have been sold at least twice within a certain period, and estimates an index by regressing the change in the (logarithm of the) price of each work on a set of dummy variables[64]. Single returns are then aggregated and averaged over all artworks to obtain the average 'market' return (Locatelli Biey and Zanola, 1999).

Assuming the characteristics of an object do not change over time, the main advantage of this method is that it bypasses the problem of heterogeneity and does not require measuring artworks' quality (Ginsburgh et al., 2006).

The major limitation is that, by discarding all the items sold once, it drastically narrows the sample[65]. By relying on a restricted number of objects that were traded more than once, it can introduce the sample selection bias. This is because reappearance on the market might be determined by non-random characteristics of the artworks (e.g. superior quality), or some external factors (such as changing fashions and trends). This, in turn, may undermine the reliability of the obtained results. It could be also argued that since the sample might be unrepresentative for the whole market, the outcomes cannot be generalized. In addition, a restricted number of observations may not always permit the construction of indices for particular sub-markets or time intervals (e.g. semi-annual or monthly indices) (Czujack et al., 1996). Furthermore, since time spans between consecutive sales are often substantial, applying repeat-sales regression usually requires the period under study to be much longer

[63] For an overview of the methods applied in particular studies see appendix B.

[64] The early simplified version of repeat-sales regression is the double-sales (geometric repeat-sales) approach, developed by Baumol (1986), and used by Frey and Pommerehne (1988, 1989a). It applies the standard continuous compounding formula to estimate the annual rate of return on objects sold at least twice within a given period (Locatelli Biey and Zanola, 1999). However, this method does not allow the construction of an art price index (de la Barre et al., 1994).

[65] This might be of lesser concern when studying the market for prints, where, assuming there are no differences in quality, sales of different impressions from certain edition may be perceived as multiple sales of the same print (Ashenfelter and Graddy, 2006).

than in the case of hedonic approach[66] (Ginsburgh et al., 2006). Another obstacle results from the potential problems with identifying the objects and attributing repeat transactions to the same artwork[67]. Finally, although repeat-sales method controls for differences in quality across the sample, it does not capture the effect of potential changes in quality that may occur between particular sales (as a result of e.g. reattribution or restoration) (Czujack et al., 1996).

An example of indices constructed with the use of repeat-sales regression is the family of Mei Moses® fine art indices created for the U.S. auction market (Mei and Moses, 2002a; www.artasanasset.com).

4.2.2. Hedonic regression

In this method, an artwork is regarded as a bundle of characteristics with implicit prices (Fase, 2001). The (logarithm of the) price of each object is regressed on a set of characteristics associated with the artwork (e.g. size, provenance, medium), artist (e.g. name, living status), or sale (e.g. auction house, location, time). The residuals are then used to construct an index (Ginsburgh et al., 2006).

The major advantage of this method is that it considers all sales. It also controls for changes in quality and implicit prices of characteristics over time[68] (ibid.). Moreover, as argued by Chanel et al. (1996), although repeat-sales and hedonic regression both give similar and unbiased results, the latter produces more precise estimates with much smaller variances[69]. In addition, hedonic method performs better than repeat-sales approach if the number of observations is small (Ginsburgh et al., 2006). It also permits the construction of indices for particular market segments. Finally, by estimating implicit prices, it allows the researcher to capture the willingness to pay for particular characteristics (Worthington and Higgs, 2006)

The method's main weakness lies in the assumption that a limited set of characteristics may reflect changes in fixed price components (Ashenfelter and Graddy, 2006). Moreover,

[66] Ginsburgh et al. (2006) argue that repeat-sales regression should not be applied to periods shorter than 20 years, since the number of observations may be too small to obtain reliable results.

[67] It is because different artworks within the artist's oeuvre may be hard to distinguish (e.g. same title, size, date, medium, etc.), especially since pre-auction catalogues and databases with auction records contain a limited set of information on artworks' characteristics. Moreover, some attributes, such as dimensions or title, may be inaccurately recorded, change over time or across auction houses. This problem can be avoided if a work can be identified by its catalogue raisonné number or provenance (Chanel et al., 1996).

[68] However, Ashenfelter and Graddy (2006) argue that the hedonic model controls only for those characteristics that are observable to the researcher.

[69] However, Locatelli Biey and Zanola (2005) argue that repeat-sales regression has better explanatory power, as compared to the less precise hedonic approach.

applying hedonic regression requires a wide knowledge of artwork's attributes and mechanisms driving art prices. It might be argued that, by disaggregating an artifact into a set of characteristics, one may never be able to capture its 'true' quality (Pesando and Shum, 2008). Therefore, the results are highly dependent on researcher's arbitrary choice and may be distorted by the misspecification of the model or omission of a single variable (Ginsburgh et al., 2006).

Hedonic price indices have been constructed and applied in numerous studies (for more details see appendix B).

4.2.3. Hybrid model approach

This method, initially developed for the real estate market, has been applied to the art market only recently by Locatelli Biey and Zanola (2005). It combines both hedonic and repeat-sales estimator, with the former used for single transactions and latter for repeat sales.

Similarly to hedonic regression, the major advantage of this approach is that it relies on all sales data. Moreover, it seems that it might reduce the volatility of the estimates.

However, it should be noted that the bias is avoided only under certain assumptions (Ashenfelter and Graddy, 2006). Another limitation is the difficulty to identify the time-varying variables (Locatelli Biey and Zanola, 2005). Finally, this method does not bypass the sample selection bias, which may arise when using repeat-sales regression (Zanola, 2007).

On the whole, due to the very limited number of applications, the potential weaknesses and strengths of this approach still remain to be researched.

4.2.4. Naïve price indices

This group of simple estimators is developed with the use of median and average prices (either arithmetic or geometric mean)[70], under the assumption that the distribution of the quality of auctioned artworks remains stable over time. To allow dynamic comparisons, the underlying sample must be precisely defined. In practice, this is achieved by constructing the sample based on a fixed criterion – for example, Stein (1977) considers only works of deceased artists created before a certain year (Fase, 2001).

[70] Since average price indices are used more often, I center my focus on this method. It should be, however, noted that Renneboog and Van Houtte (2002) consider indices based on median prices less responsive to changes in characteristics and quality of auctioned objects, and influenced by outliers to a lesser extent.

The advantage of this approach is that it uses all auction data.

Its main limitation lies in the assumption that heterogeneous objects can be considered close substitutes. Therefore, it does not permit the construction of sub-indices. Moreover, it does not control for changes in quality and artwork-specific characteristics over time. Therefore, variations in quality of the auctioned works might generate movements of the index of greater magnitude than the actual changes in prices of any given artwork. In addition, progressive changes in quality may result in fairly biased estimates (Kraüssl and van Elsland, 2008). Results might be also biased because price rises tend to be exacerbated in times of boom. In general, this method reflects changes in heterogeneity of the quality, rather than price movements of the auctioned artworks. Finally, the relevance of the sample may be lost over time (Ashenfelter and Graddy, 2006). Since the 'average' object might change in the course of time, this method is ill-suited for making historical comparisons (Candela and Scorcu, 1997).

The average price index has been computed by i.a. Stein (1977), and Renneboog and Van Houtte (2002).

4.2.5. Composite price (basket) index[71]

In this method, a fixed basket of 'representative' objects is selected by art experts. Using auction data for comparable works, prices of particular basket components are periodically revalued[72]. Basket components are then weighted and, based on average prices, an aggregate index is constructed (Fase, 2001).

The main strength of this approach is that it bypasses the problem of differences in quality. It also allows distinction to be drawn between different market segments (ibid.).

Its major weakness lies in the reliance on subjective judgments of experts, rather than the actual auction prices, and their arbitrary choice of basket components, which may not be necessarily representative for the whole market. This might, in turn, introduce a bias in the index estimates. Moreover, the uniqueness of artworks and their infrequent trading may make any comparisons between the basket components and auctioned objects hard. Finally, since

[71] Although Renneboog and Van Houtte (2004) classify basket indices as naïve price indices, I introduce this method separately, which is also in line with Fase (2001).

[72] In practice, experts reappraise basket components whenever a major auction takes place. The valuations of particular artworks reflect experts' opinions on the potential hammer prices those works could fetch if auctioned (Tucker et al., 1995).

experts might fail to discount all the available information in their valuations, their appraisals may be biased (Tucker et al., 1995)

Fase and Van Tol (1994) try to overcome the shortcomings of composite price indices. Based on the basket approach used in the Sotheby's Art Index, the authors develop a similar method. It involves replacing artworks by a fairly homogeneous group of representative artists as basket components.

The major advantage of this approach is that it bypasses the problem of artworks' heterogeneity (Fase, 2001). However, it does not resolve the issue of subjective choices made by the experts.

Composite price indices include i.a. the Sotheby's art indices, and Fase and Van Tol Index.

4.2.6. Other

Some researchers develop some alternative ways of measuring artworks' financial performance that try to overcome the limitations of the most commonly used methods. Rengers and Velthuis (2002) propose a multilevel regression. Locatelli Biey and Zanola (1999) extend the repeat-sales estimator and introduce a risk term in order to isolate market shocks that might affect artwork's price at the time of resale. Zanola (2007) applies a two-step procedure and develops a selection-corrected repeat-sales index, which tries to overcome the bias resulting from the non-random nature of data. Collins et al. (2007) propose a modified two-stage hedonic regression that corrects for the sample selection bias. Kraüssl and van Elsland (2008) also refine the hedonic approach and develop a novel two-step hedonic estimator, which allows the use of a substantially larger sample and reduces the sample selection bias. In their paper, Candela and Scorcu (1997) propose a refined version of the average price method that involves the construction of a time-invariant 'representative' object. The resulting index relies on the pre-sale price estimates, rather than auction prices. According to the authors, it bypasses the shortcomings of both hedonic and repeat-sales regression, and permits the construction of sub-indices. Finally, based on both auction prices and pre-auction estimates, Candela et al. (2004) develop a quality-adjusted price index, which overcomes the heterogeneity issue and controls for quality changes over time. It also reduces volatility and permits the construction of various sub-indices for different levels of aggregation (e.g. single artists, artistic movements, schools, whole market), even for a limited

number of observations. However, its main limitation lies in the assumption that pre-sale estimates are unbiased.

In general, it should be noted that more research should be carried out before any conclusions can be drawn on the potential strengths and weaknesses of those methods.

4.3. Correlation with other markets

As already noted in chapter 3 (section 3.4.3.2.Correlation within the art market and with other markets), many authors research whether the art market is positively correlated with other (especially stock, but also real estate) markets. The evidence seems to be mixed. Some authors[73] observe a strong causal relationship between the stock and art market. Chanel (1995) suggests that wealth created on the stock market flows to the art market with a lag of about one year. This argument is supported by Singer and Lynch (1997), although only with regard to the high end of the market. On the other hand, several studies[74] fail to identify any long-run correlation between the art and financial markets, and some researchers[75] find mixed or weak evidence on the existence of such co-movements. Finally, Worthington and Higgs (2006) suggest that the causal relationship between the Australian art and stock market has changed over time, which could be attributed to growing attractiveness of other forms of investment.

Interestingly, Candela and Scorcu (1997) identify a link between the art and real estate market, with art prices anticipating real estate prices. Hiraki et al. (2005) observe a correlation between Japanese land and art market, and Bryan (1985) detects a relationship between art and gold prices.

It should be noted that as the crisis in the U.S. subprime sector slowly spills over to other financial markets and, at the same time, art prices continue to grow, this might be the right moment to verify previous findings on the correlation between the art and financial markets. With first signals of a slowdown coming from the international art market, it seems that Goetzmann (1993) may have been right to suggest that the art market reacts strongly to the situation on the stock market and that this response proceeds with a certain time lag.

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[73] I.a. Goetzmann (1993), Goetzmann and Spiegel (1995), Chanel (1995), Worthington and Higgs (2003, 2006), Tucker et al. (1995), Wieand et al. (1998), Pesando and Shum (2008), Mei and Moses (2002a).

[74] I.a. Candela and Scorcu (1997), Campbell (2004, 2005, 2007), Campbell and Pullan (2006), Matsumoto et al. (1994).

[75] For example, Ginsburgh and Jeanfils (1995) suggest that there is a causal relationship between the art and stock market only in the short run, and Stein (1977) observes a weak correlation between London stock and auction prices.

4.4. Portfolio diversification and optimal portfolio

In order to fully assess whether art may be an attractive investment, it is not only important to measure the rate of return, degree of risk and risk-return ratio, but also determine the potential benefits of adding art to a diversified market portfolio. Art may serve this purpose only if there is a low (or negative) correlation between the returns on art and other alternative assets in investor's portfolio (Campbell, 2004).

As in the case of price co-movements on the art and other markets, the evidence seems to be mixed. According to some authors[76], art's high correlation with other asset classes and/or inferior risk-return ratio makes it a poor vehicle for diversification purposes. Others[77] argue that artworks may lower the overall risk and/or increase the returns if added to a market portfolio. Finally, Kraüssl and van Elsland (2008) claim that the potential diversification benefits may depend on whether considered from the international or European investor's perspective.

As pointed by Kraüssl and van Elsland (ibid.), in times of economic downturns, the demand for assets that have a low or negative degree of correlation with stocks or bonds is particularly high. Therefore, some researchers investigate whether artworks can serve as a hedge against downside risk. The common finding[78] is that during bear markets, returns on art suffer less from the extreme negative events and, by consistently providing positive returns, may offset lower returns on other asset classes. This characteristic of art as an alternative form of investment may be of particular importance for art funds, but also other financial institutions intending to allocate their means into art (Campbell, 2004, 2005, 2007).

An issue related to portfolio diversification is the optimal composition of an art portfolio. Assuming an investor (e.g. art fund) wants to allocate financial means in a collection of artworks, the primary concern is its optimal structure. Therefore, some authors examine the relationship between various sub-markets and try to construct the optimal art portfolio. Despite the common conclusion[79] that particular art market segments move closely

[76] I.a. Goetzmann (1993), Worthington and Higgs (2004), Anderson (1974).
[77] I.a. Pesando (1993), Pesando and Shum (1999), Edwards (2004), Mei and Moses (2002a), Kraüssl and van Elsland (2008) – only under certain assumptions, Agnello (2002), Renneboog and Van Houtte (2002) – small benefits, Worthington and Higgs (2003, 2006), Hodgson and Vorkink (2004), Campbell (2004, 2005, 2007), Campbell and Pullan (2006), Pesando and Shum (2008).
[78] I.a. Campbell (2004, 2005, 2007), Kraüssl and van Elsland (2008), Tucker et al. (1995), Agnello (2002) – only high-end works.
[79] I.a. Czujack et al. (1996), Ginsburgh and Jeanfils (1995), Flôres Jr. et al. (1999), Worthington and Higgs (2003).

together[80], the authors recognize the potential benefits of diversifying portfolio of artworks across various art categories. However, the findings on the structure of the optimal portfolio tend to differ.

Ginsburgh and Jeanfils (1995) observe that auction prices of various groups of artworks move closely together and are led by price trends in the high end of the market ('Great Masters'). The authors thus conclude that an investor may be indifferent to whether she chooses higher- or lower-end works. However, their conclusion (ibid., p.548) that 'A portfolio of Van Gogh's would do as well as a portfolio of Ginsburgh's, if these appeared more or less regularly at auctions.' is somehow questionable, for it implies that any art portfolio would perform equally well in financial terms. Flôres Jr. et al. (1999) question this view and suggest that, even though various types of art may yield similar returns, the degree of risk varies across particular market segments. Therefore, the structure of an optimal portfolio depends on the risk, as well as return characteristics. Moreover, its composition is determined by both the investment horizon and location of the market the works are purchased on. The authors argue that, due to a much smaller variance, an optimal portfolio should comprise a large share of high-end works. They also observe that those artworks set price trends for the rest of the market, which is also in line with Ginsburgh and Jeanfils' (1995) findings. Finally, Worthington and Higgs (2004) estimate that the optimal portfolio should contain only a few art categories.

4.5. Forms of art investment

4.5.1. Direct

Most data on art investment and financial performance of artworks refers to individual, direct purchases made at auctions. The calculated rates of return suggest that this form of allocating financial means might be sub-optimal from the investor's perspective. The risks involved are high and, unless the buyer can diversify across various art categories and thus decrease the risk and/or enhance the returns, or is in the position to predict future price movements (see chapter 5 Return factors, section 5.2.2.(Un)predictability of art prices), one could claim she might be rather advised to invest in art indirectly. However, it could be argued that with the help of art consultants, whose number has grown substantially over the

[80] Campbell (2007) is the only to find a low degree of correlation between particular market segments.

last years, this form of investment might yield gains also to a common individual, not necessarily having insider knowledge or connoisseurship.

4.5.2. Indirect

In this case, an individual cannot derive any consumption benefits from owning an artwork, as it is not is not in her possession. Therefore, indirect art investment may be of interest only to purely investment-oriented individuals. There are several different avenues for indirectly allocating financial means into art.

One of the first companies to have purchased art for diversification purposes was the British Rail Pension Fund[81]. Initially, the pension fund intended to use artworks as a hedge against inflation. Over time, however, art has also become a source of long-term monetary appreciation. Since 1974, the British Rail Pension Fund has allocated part of its financial means into top-quality artworks, which were then resold in the 1980s and beginning of the 1990s, with the Impressionist collection auctioned at the peak of the boom period having yielded substantial returns (Chanin, 1990). Although commonly considered a wise investment, accounting for the additional expenses and opportunity costs, artworks' financial performance has proved rather inferior, relative to alternative asset classes (Watson, 1992).

A natural consequence of the growing interest in art investment is the recent emergence of numerous companies that provide art advisory and management services, as well as offer art investment vehicles. Those include i.a. art funds, art syndicates and art mutual funds, art trusts, companies offering art banking, art advisory and art management services.

Art funds are enterprises that pool funds, and, with the use of expert knowledge, actively manage art portfolios and exploit art market inefficiencies (Mamarbachi et al., 2008). As observed by Campbell (2007), the market for art funds is still in its infancy. Within the last few years, attempts have been made to create several art funds[82]. However, only a few have actually attracted enough capital to start operating and some of them have already ceased to

[81] The first recorded attempt to reap gains from owning art on an organized basis was La Peau de l'Ors ('Bearskin'), established by a French financier André Level in 1904. It pooled financial resources of its 13 members, which were then invested in Impressionist works. When resold only after 10 years, the collection yielded an extraordinary total return of 400 per cent (Campbell and Pullan, 2006).

[82] I.a. The Fine Art Fund, Fernwood Art Investments, ArtVest, The China Fund, The Chase Art Fund, German Art Estate Kunstfonds 01, The Art Dealer's Fund, The Collector's Art Fund, Indian Yatra Fund and The Osian's Art Fund, Russian Aurora, The Art Trading Fund, Athena Fund (Gospodarek, 2007; Mamarbachi et al., 2008).

exist[83]. Among one of the major obstacles to the development of this market segment one should name very high capital entry levels, which act as an entry barrier to most individuals, as well as lack of transparency, illiquidity[84] and fairly long investment horizon, since the capital may be 'frozen' even for 5-10 years (Campbell and Pullan, 2006). Another important issue is the potential conflict of interest with regard to some art experts hired by art funds (e.g. art dealers or auction houses' employees). On the other hand, there are also several potential advantages. First of all, by holding a well-diversified portfolio of artworks, art funds may reduce the risk and enhance the returns. Through exploiting economies of scale, they can also economize on costs[85]. Finally, it is possible that with the use of insider knowledge, extensive networking and experience, experts working for art funds may be able to predict art price movements and thus systematically beat the market. This suggests that, by choosing the right art fund, an individual might benefit from art investment (Gospodarek, 2007; Campbell and Pullan, 2006).

It should be also noted that two years ago, ABN Amro bank tried to create a fund of funds, which would assemble different art funds under the umbrella of ABN Amro Holding NV. It would allow investors to diversify across different art funds, and thus further reduce the risk of investing in artworks and/or increase the returns. However, the insufficient number of art funds present on the market at that time deemed the attempt unsuccessful. Nevertheless, Campbell and Pullan (2006) argue that this structure is still likely to emerge in the future.

Art banking is offered to the high-net-worth clients as a part of the private banking segment by i.a. UBS, Deutsche Bank, Citigroup, Credit Suisse, JPMorganChase and Bank of America. They all provide art advisory services, which should help their customers to compose and set up an art collection. However, this service is not intended to provide the clients with direct investment recommendations, rather to assist them in the process of acquiring and holding art. Similarly to art funds, the major obstacle are the high capital requirements.

[83] One of the crucial questions that arises with reference to the unsuccessful art funds is whether a failure to reap extraordinary gains through active investment does not imply that it is impossible to systematically beat the market. It still remains to be researched whether the underperformance of some of those undertakings results from mismanagement and insufficient expertise, or from the random behavior of art prices.

[84] The illiquidity and lack of transparency refer to the market for art funds, as well as the art market in general (Campbell and Pullan, 2006).

[85] Art funds may be in the position to negotiate preferential conditions with auction houses and art dealers. Moreover, by renting the collections to e.g. museums, they may bear no costs of holding the artworks, reap additional gains and enhance artworks' value through active management of the art portfolio (Gospodarek, 2007; Campbell and Pullan, 2006).

Some enterprises[86] active on the art market have also entered the stock market. Purchasing their shares is probably the most indirect way of investing in art. The major advantage of this form of indirect investment is that it is accessible to a common individual and does not require substantial capital. Moreover, shares of art-related firms offer greater liquidity and transparency, as compared to art funds' investment certificates. However, the main disadvantage may be the pretty limited choice of listed companies, as well as high volatility of share prices, which partly results from the price volatility inherent to the art market in general (http://www.skatepress.com/?cat=19, visited on 28.06.2008).

Those are only a few forms of indirect investment available to individuals willing to allocate their financial means into art. As suggested by Mamarbachi et al. (2007), it is probable that the future of art investment lies in the market for art futures[87]. On the one hand, this might positively affect the degree of liquidity on the art market. However, one of the negative consequences of such development would be probably a drastic increase in the already high level of art price volatility.

[86] Those include i.a. Sotheby's Holding Inc., Artprice S.A., Artnet AG, Art in Motion Income Fund, FMR-ART'E, FINARTE CASA D'ASTE, Camera Work AG (http://skatepress.com/?cat=2, visited on 29.06.2008).

[87] To the best of my knowledge, this issue has not been investigated in the art investment literature. Thus far, the only attempt to construct derivatives with the use of artworks has been made by Campbell, who proposed art credit default swaps (ACDS) as a means of transferring the risk of holding artworks on the bank's balance sheet.

5. Return factors

5.1. Introduction

Since changes in art prices affect the rate of return, some factors determining prices are also common to the formation of returns on art. Therefore, in order to avoid unnecessary repetitions, only the major return-specific aspects will be considered in this chapter. However, it should be noted that the rate of return on art investment is an outcome of the interplay between many different factors that are hard to capture and often unobservable to a layman.

5.2. Return factors

5.2.1. Holding period, timing and 'winner's curse'

In the art investment literature, there seem to be two opposing views on the impact of the holding period on the rate of return, according to which returns are either positively or negatively correlated with time that has passed since the last auction.

On the one hand, some authors (e.g Candela and Scorcu, 1997) suggest that a resale within a short period of time will have an adverse effect on the realized return. This opinion is also shared by e.g. Sotheby's, which advises its clients to hold purchased works for at least seven to ten years (Frey and Pommerehne, 1989b). One of the major arguments put forward by the proponents of a long holding period is that the high costs involved in purchasing an artwork at an auction can be recouped only if they are spread over a longer time span. In practice, however, it may be that works resold quickly could generate returns high enough to offset the losses incurred as a result of costs being spread over a shorter time interval. It is also argued that, in independent private value auctions, a decision to resell within a short time might result in a loss of value and thus generate a negative return. This phenomenon, the so called 'winner's curse', is explained by the difference in valuations of two auction participants offering the highest and second highest bid. Should the winner decide to put the purchased artwork back on the market shortly after the initial sale, the maximum price it could fetch would be equal to the second highest bid from the previous auction. It is because no new individuals potentially interested in purchasing the artwork are likely to enter the market in the short run (Goetzmann and Spiegel, 1995). Moreover, quick reappearance on the market may generate mistrust as to the quality and value of the artwork among prospective

buyers. Finally, a lower price by the resale might also result from unfavorable changes in tastes and fashions, or imply that the owner lowered her reserve price due to an urgent need to sell (Ashenfelter and Graddy, 2006). Findings of Czujack (1997) seem to support the adverse effect of the short holding period on the returns. However, Goetzmann and Spiegel (1995) find no evidence for the existence of this phenomenon. One of the possible explanations put forward by the authors is that changes on the demand side can occur even within a short period of time.

On the other hand, Frey and Pommerehne (1989a) argue that extraordinary gains (but also losses) can be reaped only within a short time horizon. This is also in line with Baumol (1986), who also suggests that gains from owning an artwork approximate zero in the long run[88]. Watson (1992) extrapolates Baumol's results to the period of less than 20 years and conjectures that only speculative purchases may result in extraordinary returns. An explanation put forward by the author is that a short investment horizon is accompanied by higher volatility. Therefore, speculators are rewarded for bearing greater risk with an adequately higher rate of return. Moreover, Watson suggests that speculative resales are more likely to generate a positive rate of return, rather than a loss. The negative correlation between the holding period and returns on art is also observed by Matsumoto et al. (1994), but again, the authors claim that there is a tradeoff between the rate of return and degree of risk. Finally, Locatelli Biey and Zanola (1999) analyze the combined effect of the holding period and time of resale on the rate of return, and argue that higher returns can be realized in times of booming prices. This finding also undermines the viewpoint that putting an artwork back on the market within a short time interval is likely to result in a loss.

In general, the impact of the holding period on the rate of return is probably determined by many factors and hence cannot be generalized. For example, if an artifact is subject to a short-lived fashion or hype, extraordinary returns can be realized rather within a short time horizon, since the artwork may not stand the test of time and become obsolete in the long run. On the other hand, if the artwork is created by an artist who consequently builds up her reputation and is not just a temporary 'star', the length of the holding period might be positively correlated with the rate of return. Moreover, it seems that a short investment horizon may result in extraordinary gains, if the work is resold in times of booming prices, most preferably just before a slump sets in. Holding an artwork for a longer time may, in turn,

[88] It should be noted that the authors define a short holding period as 20-39 years (Frey and Pommerehne, 1989a) and 20-49 years (Baumol, 1986), although it would be more appropriate to consider those time spans as mid-term investment horizons.

be particularly lucrative for those who enter the market during a downturn and resell the work after the market recovers. Finally, although there is no general agreement on the existence of the 'winner's curse', it is highly probable that potential buyers may be deterred from purchasing an artwork that reappears on the market shortly after the initial sale. In fact, I do find evidence on the presence of this anomaly on the Polish auction market (for more details see chapter 7 Returns on art in Poland – empirical results, section 7.5.2.2.'Winner's curse').

On the whole, choosing the right timing when purchasing or selling an artwork is particularly important, since factors such as the overall state of the economy, situation on the art market, or even time of the year may strongly affect the returns on art investment (Agnello and Pierce, 1996).

5.2.2. (Un)predictability of art prices

Fluctuations of art prices and the resulting variations in returns on art investment can be largely attributed to changes in tastes and fashions. Although there seems to be no pattern, in which fashions and tastes change over time, it might be that, under certain circumstances, those shifts can be predicted. Therefore, looking from the art investment perspective, the crucial question is whether it is possible to systematically beat the market by forecasting art prices and thus yield above-average gains (Frey and Pommerehne, 1989b).

Baumol's (1986) conclusion is that random behavior of art prices resulting from unpredictable changes in tastes makes it impossible to foresee their movements, even for connoisseurs and individuals possessing insider knowledge. Therefore, not even a thorough analysis of the available data will allow an individual to enhance the rate of return. However, Buelens and Ginsburgh (1993) question Baumol's argument and observe that, in some market segments, above-average gains could be realized systematically over longer periods of time, which is also supported by Chanel et al. (1996). The authors argue that, even though turning points in tastes may be impossible to forecast, those changes set in slow enough to allow an individual to beat the market and thus reap above-average gains. Moreover, Frey and Pommerehne (1989a) suggest that there is little randomness to the behavior of art prices and claim that until the Second World War superior knowledge could have helped an investor to enhance the rate of return. Moreover, based on Landes' (2000) findings on the sale of the Ganz collection, it may be hypothesized that art historical knowledge and expertise might enable an individual to reap extraordinary gains. In addition, Frey and Pommerehne (1989b) calculate that the average difference between experts' appraisals and the actual auction prices

for the studied sample is only 8 per cent, which would further support Landes' argument. The authors note, however, that this does not imply long-term predictability of prices.

Therefore, it could be argued that, although there are no mechanisms that may permit predicting future trends and fashions, it is possible that, with the use of art historical or insider knowledge (e.g. on the upcoming major exhibition, or museum acquisition), the rise of a particular artist or artistic movement, or transition to a further career stage could be foreseen.

Finally, some authors argue that another factor that may allow forecasting changes in art prices is the lagged causal relationship between the art and stock market. If such a correlation really exists, movements of stock prices could be treated as leading indicators of price trends on the art market (Czujack et al., 1996).

On the whole, disregarding the potential role of luck, it seems that the systematic winners on the art market may be those who are able to accurately predict changes in tastes and fashions, or market success of a particular artist, artistic group, movement, school, etc. (Renneboog and Van Houtte, 2002). And even though the risk involved in 'placing bets' on the art market might be higher than in the case of other markets, it may be also argued that uncertainty associated with changes in tastes and fashions relates only to the mid and long term, whereas there is no risk involved in forecasting fluctuations of market values in the short run (Moulin, 1994). Moreover, investment risk could be probably reduced with the use of connoisseurship or superior knowledge (see section 5.2.3.Buyer type).

5.2.3. Type of buyer

As already mentioned in chapter 3 (section 3.4.5.1.Type), type of buyer might affect the price and, therewith, rate of return on art investment. Pommerehne and Feld (1997) analyze the impact of museum purchase on the returns. The authors suggest that museums located outside the U.S., which are most commonly public institutions, provide above-average rates of return to the sellers. For the studied sample, the authors calculate that such a purchase increases the average real rate of return by 2.67 per cent. However, it seems that the opportunity to realize above-average gains in a transaction involving a public museum refers only to the selected works in the high end of the market[89].

[89] Pommerehne and Feld (1997) argue that museum purchases tend to discriminate the contemporary market segment, as they favor only artworks created by artists with already established reputations.

It is also possible that, by influencing buyers' tastes and creating often short-lived fashions, some art critics, renowned collectors and art dealers[90] may be able to reap extraordinary gains (Frey and Pommerehne, 1989b). This applies especially to several famous collectors, whose numerous purchases, accompanied by intensive marketing efforts, allow them to promote particular artists, artistic movements, etc., and thus generate new fashions and trends (Moulin, 1994). This, in turn, contributes to significant price increases and, as a result, enhances the rate of return on purchased artworks. In fact, even though Baumol (1986, p.14) precludes the possibility to systematically beat the market, he acknowledges the fact that '[…] those critics who have succeeded as instruments for the redirection of general tastes seem really to have been in a position to profit from their judgment.' On the whole, information asymmetry prevalent on the art market may give some members of the art world a competitive edge over other market participants. However, it still needs to be researched what kind of information could serve as such.

Finally, the realized return might also depend on the negotiating power of the seller. Since seller's commission, in contrast to a fixed buyer's premium, is often negotiated between the auction house and owner, some consignors may be able to obtain better sale terms, which would, in turn, enhance the returns[91] (Ashenfelter and Graddy, 2003). Moreover, wealthy buyers might be able to borrow money at a lower rate and, as a consequence, purchase art at a relatively lower cost, which may further increase the net return (Singer and Lynch, 1997).

Unfortunately, thus far the potential impact of various types of buyers on the financial performance of art has received little attention. This is probably because information on buyers is either hard to obtain or is kept secret.

5.2.4. Anomalies

5.2.4.1. 'Declining price' anomaly ('afternoon effect') and 'morning effect'

Although the evidence on the existence of either the 'declining price' anomaly or 'morning effect', i.e. higher likelihood of hammer prices, as well as hammer prices relative to pre-auction estimates to decrease or increase towards the end of the auction (see chapter 3

[90] E.g. Larry Gagosian, J. Paul Getty, Ronald Lauder, Solomon R. Guggenheim, Charles Saatchi, Paul Durand-Ruel, Daniel-Henry Kahnweiler, Leo Castelli.

[91] Better sale conditions encompass not only a lower seller's commission, but also e.g. loans with art as collateral given by some major auction houses to their customers, or a guaranteed minimum sale price.

Determinants of art prices, section 3.4.8.Anomalies), is mixed, it cannot be excluded that returns on art investment may be affected by the lot ordering and lot number.

5.2.4.2. 'Masterpiece effect'

One of the most important issues with regard to the magnitude of realized returns is whether the most expensive artworks systematically outperform the market. This point of view seems to be prevalent especially among art dealers, who suggest their clients to allocate financial means only into high-end works (Pesando, 1993). The evidence on the existence and direction of the 'masterpiece effect' is mixed. Several researchers[92] find no proof that the most expensive works outperform the market. Others argue that masterpieces (usually defined by price) offer returns below[93] or above[94] the market average. Finally, Pesando and Shum (2008) observe both out- and underperformance of masterpieces defined by price, but for the sample defined by the pre-auction estimates they discover a positive 'masterpiece effect'. Moreover, Ashenfelter and Graddy (2003) detect underperformance of the Contemporary, but not Impressionist masterpiece sample. In addition, Ursprung and Wiermann (2008) identify a phenomenon similar to a positive 'masterpiece effect', namely that works created by deceased minor artists depreciate much faster than those executed by top late artists.

According to Pesando (1993), on an efficient market, masterpieces should not outperform other market segments by offering above-average returns or a favorable risk-return ratio, since all the desirable properties of the artworks should be discounted in their price. However, many anomalies present on the art market undermine its efficiency. For example, museum purchases may inflate prices of the high-end works and thus generate a positive 'masterpiece effect'. Moreover, since a high price is often accompanied by top artistic quality, as well as already the established reputation and standing of the artist, it could be argued that uncertainty and risk of a future decline in value of a masterpiece is lower than in the case of other art categories (Moulin, 1994). Therefore, a negative 'masterpiece effect' could be caused by a tradeoff between the degree of risk and rate of return[95] (Anderson,

[92] I.a. Goetzmann (1996), Ginsburgh and Jeanfils (1997), Flôres Jr. et al. (1999).
[93] I.a. Anderson (1974) – weak evidence, Pesando (1993), Mei and Moses (2002a, 2005), Landes (2000).
[94] I.a. de la Barre et al. (1994), Singer and Lynch (1997), Agnello and Pierce (1996), Agnello (2002).
[95] However, Mei and Moses (2005) argue that systematic risk does not explain the existence of the negative 'masterpiece effect'. Since high-end works are usually purchased by wealthy individuals and cultural institutions that could easily diversify the risk, no price premium should be paid for the lower volatility of masterpieces.

1974). Finally, since the market for top-quality artworks is less thin, a lower rate of return could be also associated with higher liquidity of masterpieces (Mei and Moses, 2002a).

On the other hand, lower returns on masterpieces could result from e.g. the 'winner's curse' (Pesando and Shum, 2008), or past overbidding and a subsequent mean reversion of returns[96] (Mei and Moses, 2002a). Another explanation could be the so called 'survivorship bias' of the data[97] (Goetzmann, 1996). In practice, this would imply that less expensive artworks might actually perform worse than masterpieces, but this effect will not be identified, since their substantial decrease in value excludes them from the studied sample. It is also possible that collectors may be deriving higher consumption benefits from owning a masterpiece, which are offset by lower financial returns (Mei and Moses, 2002a).

The major problem with regard to the 'masterpiece effect' is whether relying on the auction price when selecting the masterpiece sample does not bias the results, since market value may not always reflect the 'true' value of the artwork. It may be argued that using other measures, such as pre-sale price estimates or number of reproductions in the art historical literature (method used by Galenson), to define masterpieces would be more appropriate[98] (Pesando and Shum, 2008).

5.2.4.3. Violation of the 'law of one price'[99]

In the absence of varying transaction costs[100], as well as regulatory or other barriers, there should be no systematic differences in prices for the same or similar objects between distinct markets (Ashenfelter and Graddy, 2006; Pesando and Shum, 2007). As already noted (chapter 3 Determinants of art prices, section 3.4.6.2.1.Name and location (violation of the 'law of one price')), there is abundant evidence that the 'law of one price' does not hold for the art market. Many studies[101] observe systematic differences in prices fetched at different

[96] This implies that works that underperformed in the past will appreciate in the future, whereas artifacts that previously outperformed the market will decrease in value, probably as a result of past overbidding.

[97] 'Survivorship bias' is inherent to repeat-sales regression and implies that only transactions involving artworks, which are in demand high enough for at least two sales to occur (e.g. those that did not fall out of fashion and/or are of superior quality), are included in the sample.

[98] Ashenfelter and Graddy (2006) suggest that a positive 'masterpiece effect' could result from the sample being defined by a variable other than auction price. This refers to de la Barre et al. (1994), Singer and Lynch (1997), ans Pesando and Shum (2008).

[99] Pesando and Shum (2007) refer to this phenomenon as 'noise'.

[100] This holds e.g. for Christie's and Sotheby's.

[101] I.a. de la Barre et al. (1994), Pesando (1993), Pesando and Shum (1996, 2007), Mei and Moses (2002a) – mixed evidence, Renneboog and Van Houtte (2002), Ekelund et al. (1998), Czujack (1997), Higgs and Worthington (2005), Worthington and Higgs (2006), Agnello and Pierce (1996), Hodgson and Vorkink (2004), Ashenfelter and Graddy (2007), Wieand et al. (1998), Chanel et al. (1996), Førsund and Zanola (2001,

auction houses (with works auctioned at Christie's and Sotheby's commanding substantial price premiums), same salerooms located in different cities, or between distinct geographic regions (cities, countries, continents). However, despite the general agreement on the violation of the 'law of once price', the particular findings are mixed and sometimes even contradictory. This is best illustrated by the paper of Pesando and Shum (2007). After extending the period studied by Pesando (1993) and dividing it into two sub-periods, the authors observe that prices of Picasso prints realized in the first period are higher at Sotheby's than at Christie's in New York – a pattern that is reversed in the subsequent period. Moreover, prices fetched at Kornfeld in Switzerland in the second period are no longer higher, relative to other auction houses.

Nevertheless, this market inefficiency has some implications for the magnitude of the yielded gains. If prices fetched in particular cities, countries or geographic regions (e.g. the U.S. versus Europe) are, in fact, persistently higher, and if some auction houses can contribute to significant increases in the hammer price, this may give the owner a chance to enhance the rate of return on the auctioned work. One should note, however, that the potential to reap above-average gains exists only under the assumption that they are not offset by the transaction costs. Moreover, since there is no general agreement on which auction houses or locations are the best 'performers' in terms of realized prices, this may also imply that even a consciously made choice of the auction house may not necessarily allow the seller to positively affect the returns.

5.2.4.4. Pre-auction price estimate bias

In order to identify and measure the potential impact of this variable on the returns on art investment, one should first answer the question whether bidders are credulous, i.e. whether they are guided in their valuations and willingness to pay by the pre-sale price estimates. This issue has been addressed by several authors. For example, Mei and Moses (2005) observe that bidders' valuations may be affected by the pre-sale estimates (so called 'anchoring effect' or reference dependence). Moreover, they discover an upward bias in experts' appraisals of the most expensive paintings, and argue that an increased estimate translates into a higher hammer price, which, in turn, has an adverse effect on the future return

2002, 2006), Chanel et al. (1996), Ginsburgh and Schwed (1992), Ursprung and Wiermann (2008), Sproule and Valsan (2006).

(but at the same time it enhances the return for the previous owner)[102]. However, Czujack (1997) does not identify any link between the pre-sale estimates and auction results. It is possible that the overall impact of this variable on the rate of return depends on the type of auction participants, their knowledge, information set and values (common versus private).

It should be also noted that the evidence on whether experts provide accurate pre-sale price estimates of the auctioned objects is mixed. Some studies[103] observe that they are truthful and good predictors of the hammer prices. Other[104] identify systematic under- or overvaluations. Nevertheless, it is not clear whether this is a part of a conscious strategy of the auction houses.

5.2.4.5. 'Burned painting' anomaly

Some authors (e.g. Anderson, 1974; Ashenfelter and Graddy, 2006) identify the existence of the so called 'burned painting' anomaly, which implies that a failure to sell at an auction may negatively affect the future price, or even deter potential buyers from buying the artwork by the resale, and thus generate a loss to its owner. For example, Beggs and Graddy (2006) estimate that a failed auction may depress the return by around 33 per cent. There are numerous explanations for this phenomenon. First of all, assuming bidders have common values, a failure to sell might convey a negative message about the artwork's market value, which may be capitalized in bidders' valuations and thus depress its future price. Second, 'burning effect' may be explained by unfavorable changes in tastes and fashions. Finally, lower hammer price by the resale may result from a decrease in the reserve price (e.g. due to owner's urgent need to sell). However, Beggs and Graddy (2006) argue that the adverse effect of failing at an auction on the rate of return could be reduced or even annulled by putting the artwork back on the market more than two years after the initial sale, or, irrespective of the time that has passed since the last auction, by moving the work to another auction house.

[102] The authors also observe that in the case of Old Master paintings, an increase in the estimate spread (i.e. difference between its upper and lower bound) tends to positively affect the excess returns.
[103] I.a. Ashenfelter (1989), Lourgand and McDaniel (1991), Ashenfelter and Graddy (2007), Sproule and Valsan (2006).
[104] I.a. Chanel et al. (1996), Beggs and Graddy (1997, 2005), Bauwens and Ginsburgh (2000), Mei and Moses (2005), Ekelund et al. (1998), D'Souza and Prentice (2002), Czujack and Martins (2004), Valsan and Sproule (2007), Landes (2000).

5.2.4.6. ‘Death effect’

The so called ‘death effect’, i.e. an immediate increase in prices following artist’s death, may affect the rate of return. Assuming the owner puts the work of a recently deceased artist on the market shortly after her death, she may be able to profit from the rapid growth in the (often speculative) demand. However, according to Ursprung and Wiermann (2008), the overall impact of this effect on the price and, therewith, realized returns will depend on artist’s age at the time of death and the quality of her oeuvre. It is possible that extraordinary gains could be made only in the case of some already established artists, whereas untimely death might actually depress the market value of works created by individuals who were at the beginning of their career. Moreover, some authors (e.g. Buelens and Ginsburgh, 1993) conclude that the evidence on the impact of artist’s living status at the time of sale on the price is mixed, or even question its significance (e.g. Kräussl and van Elsland, 2008).

5.2.5. Arbitrage

Having reviewed the major market anomalies and their potential impact on the realized returns, one could ask why it is possible that substantial differences in prices persist over longer time periods and are not eroded by arbitrage. First of all, it is argued that arbitrage cannot work systematically on the art market, since the long-term hierarchy of artists and artworks cannot be determined ex ante. Moreover, the art market is illiquid and it takes long before an artifact can be bought or sold. It is also possible that the substantial risk involved in acquiring art might outweigh the potential financial gains (Frey, 1997). Finally, effective arbitrage is also inhibited by substantial costs, information asymmetry and, in some cases, trade restrictions and barriers (Wieand et al., 1998). The persisting price discrepancies may also partly result from the fact that collectors, who predominate on the art market, might be more reluctant to take advantage of arbitrage opportunities than financially-driven investors or speculators (Ginsburgh and Jeanfils, 1995).

5.2.6. Correlation with other markets

As already mentioned in previous chapters, there is some disagreement on the relationship between the art and other markets. Assuming, however, there exists a certain

degree of correlation, returns on art may be positively affected in times of bull markets, especially by growing stock prices.

5.2.7. Costs

To the best of my knowledge, thus far the only attempt to quantify the impact of transaction costs on the returns on art investment has been made by Frey and Pommerehne (1989a), who assess them to depress the annual real rate of return by 0.4 per cent[105]. At first, this figure might seem negligible. However, when taking into account other expenses, such as insurance costs, which are estimated to amount to up to 1.0 per cent of the artwork's appraised value per annum (Worthington and Higgs, 2003), total costs become considerable. A particularly unfavorable picture emerges when transaction and other costs are compared to those borne by individuals investing on financial markets (1.0-2.5 per cent, as argued by Renneboog and Van Houtte, 2002). Besides buyer's premium and seller's commission[106], which vary across auction houses and countries, and change both with the artwork's estimated value and seller's identity, buyers must also pay VAT on buyer's premium. Unlike in the case of stocks, purchasing art involves also substantial additional expenses, such as: export/import customs duties, insurance, maintenance, restoration, transportation and storage costs, expenses related to security measures, costs resulting from 'droit de suite' (resale right), etc. Due to their high extent, many authors (e.g. Mei and Moses, 2002a) argue that art may be an attractive form of investment only if costs can be spread over a longer period of time. Considering that most studies find returns on art to be rather low, it may be that the rates of return could approximate zero, or even be negative, when additional expenses are taken into account.

5.2.8. Tax benefits

Favorable regulations with reference to capital gains and sales taxes, property taxes and death duties, VAT, donations of artworks, etc. may stimulate demand and thus enhance the rate of return. However, as already noted in chapter 2 (section 2.3.4.Taxes), the overall impact of this variable on the returns is very hard to measure. To the best of my knowledge,

[105] It should be, however, noted that this figure could be different now, as it was calculated in 1989.
[106] Transaction costs are estimated to typically amount to between 10 and 30 per cent of the hammer price (Frey and Eichenberger, 2003).

thus far no attempts to account for potential tax benefits resulting from holding an artwork when calculating the returns on art have been made.

5.2.9. Inflation

As already mentioned in chapter 3 (section 3.4.3.3.Inflation), some authors suggest that artworks may be used as a hedge against inflation. Therefore, a general increase in prices might stimulate demand for art, positively affect art prices and thus enhance returns on art investment. By far, this issue has received little attention. The evidence on the hedging potential of art, and relationship between art prices and inflation is mixed. Whereas Campbell (2004) argues that artworks can serve as a good inflation hedge, Renneboog and Van Houtte (2002) conjecture the opposite. However, an interesting finding of Pesando (1993) is that, unlike in the case of traditional financial assets, there might be a positive correlation between real returns on art and inflation rate[107]. Moreover, Matsumoto et al. (1994) discover a link between the rate of return and inflationary expectations. Nevertheless, more research needs to be carried out before any conclusions can be drawn on this issue.

5.2.10. Psychic versus financial returns

There seems to be a general consensus on the existence of two types of returns yielded by artworks, namely financial and psychic returns (consumption benefits). The former are measured by the change in the monetary value of the artifact (Frey and Eichenberger, 1995a). The latter, however, are harder to estimate and can accrue only to those individuals who derive aesthetic pleasure or prestige benefits from owning an artwork, rather than anticipate its monetary appreciation (Atukeren and Seçkin, 2007). One of the methods of capturing psychic returns proposed by many authors is to measure the difference between the rate of return on art and alternative asset classes[108] (Frey and Eichenberger, 1995a). The underlying assumption is that, in competitive market equilibrium, every form of investment yields the same return[109] (Baumol, 2007). Therefore, total returns on art, which are a sum of financial and psychic returns, should equal total returns on alternative asset classes. This implies that,

[107] However, Pesando (1993) concludes that this correlation is low and statistically non-significant.

[108] Some alternative methods of measuring psychic returns include estimating the willingness to pay (method proposed by e.g. Frey and Eichenberger, 1995a), using rental fees for art objects as reference points (e.g. Stein, 1977), or calculating the alpha parameter in CAPM (e.g. Atukeren and Seçkin, 2007), which is considered to capture psychic returns net of transaction and other costs (ibid.).

[109] Otherwise, differences in the rates of return would be evened out by arbitrage.

providing an individual yields consumption benefits from owning an artwork, the monetary return on art should be, in equilibrium, lower than on other, comparably risky assets (Frey and Pommerehne, 1989b). Moreover, the extent of psychic and financial returns may be determined by the type of buyers present on the market – the higher the number of collectors deriving consumption benefits from owning an artwork, relative to pure investors or speculators, the higher the psychic and lower financial returns (Frey and Eichenberger, 1995a). This point of view seems to be supported by the outcomes of most studies, according to which, on average, returns on art are lower than on alternative assets. However, the main limitation of this approach lies in the assumption that returns on art are necessarily lower than on other forms of investment, which is not always the case (Atukeren and Seçkin, 2007).

One of the few studies that attempts to quantify psychic returns is made by Stein (1977), who estimates the average return on 'viewing services' to amount to 1.6 per cent annually for a collector and zero for investment-oriented buyer. However, still more research needs to be carried out before any final conclusions can be drawn on this issue.

5.2.11. Maturity of the market

Although, to the best of my knowledge, none of the previous studies has examined the robustness of this argument, maturity of the national market might have an impact on the realized returns. It is possible that art traded on the less developed markets may be underpriced, relative to the prices fetched on the international art market. This anomaly could be caused by many factors. First of all, immaturity of the art market could be associated with the country's lower economic development. As a result, buyers' wealth, willingness to pay and overall demand may be lower than on some more mature markets. Secondly, particular art categories (especially contemporary art) could be undervalued. Therefore, systematic price differences between works traded on the domestic and international auction market could occur. This would, in turn, create arbitrage opportunities. Assuming that those price differences are large enough to offset high transaction costs, purchasing an artwork on the national art market and reselling it outside the country might allow an individual to reap above-average gains. However, this strategy could apply only to the internationally recognized artists[110]. Finally, it may be the case that anomalies present on the underdeveloped markets are more pervasive and offer better financial opportunities, relative to other, more

[110] Otherwise, it could have a reverse effect and result in a loss.

mature markets, which are overridden by information asymmetry, behavioral anomalies, market thinness, etc. to a lesser extent. In fact, this assumption forms the basis for the empirical part of my study, which is presented in chapter 7.

6. Polish art market

6.1. Introduction

While carrying out research for this chapter, I have come to discover, contrary to my expectations, that thus far no reliable information on the Polish art market have been systematically collected and, to the best of my knowledge, no serious scientific research has been undertaken. This discovery was further supported by the opinions of various people active both on the primary and secondary market I have interviewed for the purpose of this thesis[111]. There are no databases or statistical sources comparable to those created for other countries (e.g. Artprice.com, Artnet.com, Artfacts.com) that would provide some basic information on the national art market[112]. Moreover, data on the Polish art market collected internationally is incomplete and biased, for it usually focuses on the part of the high end of the market. On the one hand, this is not surprising when accounting for the fact that the Polish art market has a history of only 20 years, as compared to sometimes more than two centuries in other countries. Another reason is the thinness of the market and limited demand for such information. However, what is more striking is that the main actors (i.e. auction houses, art dealers, galleries, public institutions) show no interest in researching the art market. Therefore, the only publicly available data refers to auction transactions, and its reliability is questionable (see section 6.3.2.Obstacles and problem issues). As a consequence, the figures presented in this chapter should be treated as rough estimates, rather than exact numbers. There have been a few attempts to analyze the Polish art market, but the methodology applied was rather qualitative. This chapter aims at partially filling in this gap by analyzing the art market in a more quantitative manner. It also shows that an extensive research needs to be carried out. Hopefully, it is a matter of the nearest future.

In this chapter, I rely mostly on articles and interviews published in Polish art newspapers and magazines, as well as daily, weekly and economic press. My findings have

[111] Those include i.a. Katarzyna Włodarska, chief editor of *Art & Business* magazine, the major publication devoted to the Polish art market and Marek Lengiewicz, the owner and head of the major Warsaw-based auction house DA Rempex.

[112] The only quasi-comparable data source is www.artinfo.pl – the biggest portal containing information on the Polish art market. However, it collects data only on the major auctions and does not monitor the market in a systematic manner. For more details on data sources see chapter 7 Returns on art in Poland – empirical results, section 7.3.Data.

been later verified in the interview with Marek Lengiewicz, the owner and head of the major Warsaw-based auction house DA[113] Rempex[114].

6.2. History

Poland, together with other Central and Eastern European countries, for decades remained under the influence of the Soviet Union. Therefore, Polish art market can be considered one of the youngest in Europe, with its most recent history dating back to 1988. This was the year when the government introduced a legislative reform allowing unrestrained economic activity, which resulted in the foundation of the first auction house – AA[115] Unicum (later renamed to DA Unicum). Another decisive point was the introduction of an exchangeable, real dollar and unification of its exchange rate. It can be assumed, however, that Polish market officially came to existence with the fall of communism and transformation into a free-market economy. Auction houses began to operate on a regular basis no sooner than in 1990 (Sarzyński, 1999; Studziński, 2007).

This does not mean that the art market did not exist in earlier times. On the contrary, its history dates back to the end of the 19th century, when the first art dealers and so called 'salons' exhibiting artworks (primarily paintings) appeared. In the mid-war period, two Warsaw-based auction houses[116] operated on the market. Auctions were also organized by one of the 'salons'. Until 1950, even during the Second World War, art was both purchased and sold on a, more or less, regular basis (Bołdok, 2004).

The situation changed drastically in 1950 with the official abolition of private trade by the state. Whereas some privately owned galleries did exist before 1989, and minor artworks could be bought on local art fairs and market places, the secondary market was monopolized by the state (ibid.). There was only one firm, namely PP[117] DESA – a state-owned enterprise founded in 1950, which possessed monopolistic power in art trade (Sarzyński, 1999). However, it should be noted that DESA was not an auction house, rather a public art dealer organized as a chain of subsidiaries located in major cities. The art market functioned as a so called 'art circuit', with fixed minimal prices for each type of artifact determined by the state

[113] DA stands for 'auction house'.
[114] I have chosen Marek Lengiewicz as my interviewee, since he is widely recognized as an expert on the auction market, whose opinions are often quoted in the press. This interview helped me gain a deep insight into the structure and workings of the Polish secondary market.
[115] AA stands for 'auction agency'.
[116] Those were Dom Sztuki and Pałac Sztuki.
[117] PP stands for 'public enterprise'.

and collected in the so called 'price lists' (Korzeniowska-Marciniak, 2001). Since prices were not an outcome of the interplay between supply and demand, they did not reflect the 'true' value of the artworks, which resulted in artifacts being either greatly undervalued, or overpriced[118]. As a result of a short supply, the 1970s and 1980s witnessed a dramatic increase in art prices, which, in turn, narrowed the circle of potential buyers (Windorbski, 2007).

The introduction of the free market sparked entrepreneurial activity on both primary and secondary market, and led to an increase in supply. With the appearance of the first fortunes in the beginning of the 1990s, the new rich class became interested in buying art, mostly for prestige benefits. Between 1990 and 1992, the art market witnessed an extraordinary boom in prices, created mostly by the demand of one buyer – Art-B holding that purchases art to launder dirty money (Studziński, 2007). Its extraordinary demand (especially in the high end of the market) on the, back then, very thin market artificially inflated prices (Sarzyński, 1999). Company's bankruptcy and the resulting rapid estate liquidation generated a drastic decrease in demand and oversupply of artworks. As a consequence, a major slump set in – only in 1992, on average, prices fell by 50 per cent and auction market turnover by approximately 80 per cent (ibid.; Windorbski, 2007). It took another 7 years until the market fully recovered (Sarzyński, 1999). The end of the 1990s witnessed a boom period, which peaked in 2000, when the thus far highest number of record hammer prices was fetched (8 out of 12 sales that have crossed the one-million-złoty benchmark were hammered down that year).

Table 1: National auction records for Polish paintings (hammer prices above the one-million-złoty benchmark)

Author	Title	Date of creation	Hammer price (in zł)	Hammer price (in $)[1]	Date of sale	Auction house
Henryk Siemiradzki	'Rozbitek'	1878	2,130,000	485,000	10.12.2000	Polswiss Art
Jacek Malczewski	'Polonia'	1914	1,600,000	355,500	28.05.2000	Polswiss Art
Józef Chełmoński	'Próba czwórki'	1887	1,580,000	648,000	13.12.2007	DA Desa Unicum
Eugeniusz (Eugene) Zak	'Lutnista' ('Mandolinista')	1921	1,400,000	339,000	5.03.2000	Poslwiss Art
Alfred Wierusz-Kowalski	'Awangarda myśliwska'	1880	1,360,000	579,000	16.03.2008	DA Agra-Art

[118] The intention behind artworks being underpriced was to enable public institutions to acquire them for prices below their market value (Lewicki, 2004).

Aleksander Gierymski	'W alei lipowej'	around 1895	1,300,000	298,000	14.12.2000	DA Desa Unicum
Władysław Czachórski	'Pierwsze róże'	1891	1,300,000	295,500	10.12.2000	DA Agra-Art.
Władysław Czachórski	'Aktorzy przed Hamletem'	1872-75	1,270,000	312,500	23.03.2000	Polski Dom Aukcyjny 'Sztuka'
Olga Boznańska	'W atelier' ('Wnętrze pracowni')	around 1890	1,250,000	278,000	28.05.2000	Polswiss Art
Józef Chełmoński	'Próba czwórki'	1887	1,200,000	294,000	20.05.2001	Polswiss Art
Władysław Czachórski	'Przed balem'	1887	1,150,000	280,500	19.03.2000	DA Agra-Art
Olga Boznańska	'Zadumana dziewczynka'	1889	1,150,000	489,000	16.03.2008	DA Agra-Art

Source: www.artbiznes.pl, www.polswissart.pl, www.desa.pl, www.agraart.pl, www.sztuka.com.pl.

[1] Calculated based on the average exchange rate valid on the day of sale.

Table 2: Top international auction records for Polish contemporary art

Author	**Title**	**Medium and technique**	**Date of creation**	**Hammer price (excl. buyer's premium) (in $)**	**Sale price (incl. buyer's premium) (in $)**	**Date of sale**	**Auction house**
Piotr Uklański	'Naziści' ('The Nazis')	Set of 164 photographs	1998	approx. 930,000 (£500,000)	approx. 1,056,000 (£568,000)	14.10.2006	Phillips de Pury & Co. (London)
Piotr Uklański	'Untitled (Skull)'	Blueboard ink print	1999	350,000	408,000	11.05.2006	Phillips de Pury & Co. (New York)
Wilhelm Sasnal	'Samoloty' ('Airplanes')	Oil on canvas	1999	330,000	396,000	16.05.2007	Christie's (New York)
Piotr Uklański	'Untitled (Monsieur François Pinault, Président du Groupe Artemis)'	Chromogenic print	2003	200,000	240,000	16.05.2007	Sotheby's (New York)
Piotr Uklański	'Untitled (Skull)'	Blueboard ink print	2000	190,000	228,000	16.11.2006	Phillips de Pury & Co. (New York)
Wilhelm Sasnal	'UFO'	Oil on canvas	2002	180,000	216,000	16.11.2006	Phillips de Pury & Co.

							(New York)
Wilhelm Sasnal	'Samoloty i bomby' ('Plane and bombs')	Oil on canvas	2001	170,000	204,000	11.05.2006	Phillips de Pury & Co. (New York)

Source: www.artinfo.com, www.phillipsdepury.com, www.sothebys.com, www.christies.com.

However, it did not take long till the economic downturn and resulting sudden decrease in demand changed the situation on the art market (Lewicki, 2004). Particularly affected were the auction prices of members of École de Paris – artists that lived and created in Paris between 1890 and 1939. Together with the so called 'Munich school' – academic and realist painters that studied in Munich in the period 1875-1914, and a group of other modern classics active at the turn of the 19th century, it has been, thus far, the most popular and expensive artistic movement[119]. However, since 2004, the market seems to have recovered and stabilized, and members of École de Paris are back in favor (Lewicki, 2008). The accession to the European Union in 2004 has additionally stimulated art market dynamics and systematic price increases have been observed until now (Studziński, 2007). With the last year being the best one for the auction houses since 2000, the perspectives for 2008 seem to be very promising (Lewicki, 2007).

6.3. Market structure

Using the terminology applied to financial markets, the Polish art market could be described as an 'emerging' market. This is not only due to its young age, but mainly thinness, and the still ongoing process of stabilization and maturation. Some elements of the art market structure, present in Western countries for many years, are either missing in Poland, or remain fairly underdeveloped. This view seems to be supported by the absence of foreign auction houses, which do not consider Poland ready for becoming a part of the international art market. Nevertheless, some major characteristic features of the Polish art market resemble those encountered in other countries. Those include its division into the primary and

[119] Among members of École de Paris one should name: Eugeniusz (Eugene) Zak, Władysław Ślewiński, Tadeusz Makowski, Olga Boznańska. To 'Munich school' belong i.a.: Józef Brandt, Józef Chełmoński, Alfred Wierusz-Kowalski, Władysław Czachórski, Juliusz Kossak, Julian Fałat, Aleksander and Maksymilian Gierymski. The most renowned modern classics are: Jacek Malczewski, Henryk Siemiradzki, Stanisław Wyspiański, Leon Wyczółkowski (Sarzyński, 1999; Bołdok, 1998).

secondary[120] market, and concentration of the art trade in the capital city – Warsaw, home to many galleries, major auction houses, cultural institutions and enterprises offering art-related services.

In the subsequent parts, I characterize Polish secondary market, point to some obstacles to its development and analyze major changes that have occurred within the last 20 years.

6.3.1. Secondary market

In 1990, 8 auction houses operated on the Polish market[121]. Since the beginning of the 1990s, it has witnessed the emergence and fall of several medium-sized auction houses[122], as well as small-sized commercial galleries, art dealers and auction houses operating on a local scale[123] (Sarzyński, 1999; Korzeniowska-Marciniak, 2001; Bołdok, 2005).

At present, there are 9 major auction houses operating on the national level that organize auctions on a regular basis[124]. Whereas Nautilus specializes in collectibles in general, the remaining ones deal predominantly in paintings, drawings and prints (auction houses' websites).

In terms of revenue, in 2007, market leaders were DA Desa Unicum (6.32 million euro[125]), DA Rempex (5.16 million euro) and DA Agra-Art (3.74 million euro) (Mazurkiewicz, 2008). However, when considering the annual number of auctions and, therewith, the number of auctioned and sold objects, the market leader was DA Rempex, with at least two auctions organized and around 100 art objects sold on average every month

[120] Polish secondary market encompasses both art dealers and auction houses. Due to the absence of international auction houses, it is not a part of the tertiary market.

[121] Those are: DAES (Dom Aukcyjny Edwarda Śmigielskiego), DA DESA, Polski Dom Aukcyjny, DA Unicum, DA Agra-Art, Polswiss Art, DA Rempex and Altius. A year later, DA DESA was divided and two auction houses with seats in Warsaw and Krakow (it consolidated all DA DESA's subsidiaries) were created. In 1997, the latter was privatized, which gave birth to DESA Krajowa. In 1998, DA Unicum, together with two other strategic investors, acquired the majority of shares in DA DESA. As a consequence, it was privatized and the consolidation gave rise to DA Desa Unicum (Sarzyński, 1999; Korzeniowska-Marciniak, 2001; Bołdok, 2005).

[122] Those include: Polski Dom Aukcyjny 'Sztuka', Sopocki Dom Aukcyjny, Śląski Dom Aukcyjny, Polonia-Art Dom Aukcyjny, Panorama Art Gallery Dom Aukcyjny, Galeria w Willi Struvego.

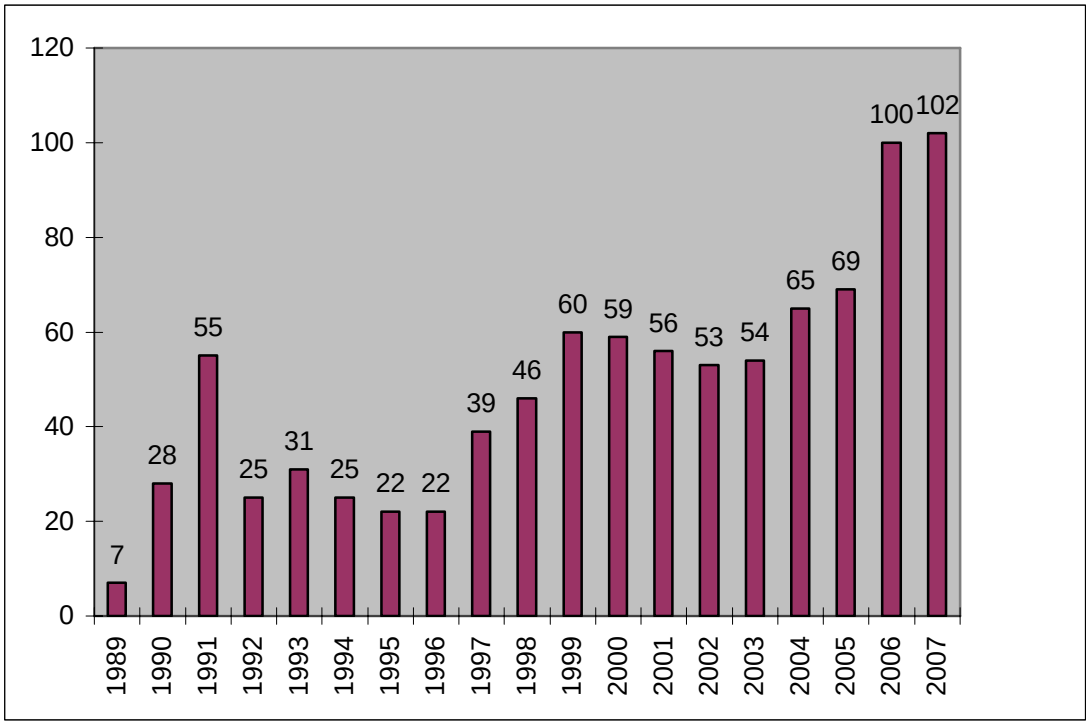
[123] Such as: Galeria Atena and Noble House in Warsaw, Galeria Fizek and Galeria Horn in Poznań, Pałac pod Baranami and Galeria/DA Vindobona in Krakow, Galerie Horszowski in Wrocław, Gdańsko-Flamandzki Dom Aukcyjny in Gdańsk.

[124] I.e.: DESA Krajowa, DA Desa Unicum, DA Agra-Art, Polswiss Art, DA Rempex, DA Ostoya, Rynek Sztuki, Okna Sztuki and Nautilus.

[125] As I calculate all the values using the average annual exchange rates relevant for a given year, they should be treated as close approximations, rather than exact numbers.

(interview with Marek Lengiewicz; www.rempex.pl). In general, within the last two decades, there has been a great increase in the number of auctions held each year.

Table 3: Total number of auctions held annually in Poland



Source: Sarzyński (1999), Bołdok (2005), Główny Urząd Statystyczny (2007).

In 2006, there were 9,200 auctions of fine art organized worldwide (Artprice, 2006).

Table 4: Major data on the Polish auction market

	2007	**2006**	**2005**
1. Turnover			
a) Total	€ 9.55 million	€ 7.75 million	€ 8.38 million
Contemporary	€ 1.88 million	€ 1.00 million	
b) World			€ 3,380 million
2. Number of objects			
a) Offered	12,100	over 10,000	
Contemporary	3,650 (30%)	2,000 (incl. 700 'conditions'[1])	
b) Sold	3,700 (30%)		
Contemporary	1,790 (15%)		
Above 100,000 złoty	87 (0.7%)		
Contemporary	21 (0.2%)		
3. Paintings' share			
a) Poland	90% (estimate)		
b) World		75.7%	
4. Share in the art market			

a) Poland	30-50% (estimate)		
b) World			
Number of objects sold		0.7% (estimate)	
Turnover		0.2% (estimate)	
5. Transaction costs[2]			
a) Buyer's premium	10%+ 22% VAT		
b) Seller's commission	10-20% (negotiated)		
6. Number of bidders		7,605	10,163
7. Number of buyers			
a) Regular	1,000 (estimate)		
b) Total above 10,000 złoty (2,600 euro)	2,000 (estimate)		
c) Total above 50,000 złoty (13,000 euro)			approx. 20 (estimate)

Source: Lewicki (2008), Gospodarek (2007), Sarzyński (1999), Studziński (2008a), Lewicki (2004), interview with Marek Lengiewicz, Mazurkiewicz (2008), Witkowski, Naszkowska (2007), Flankowska (2007), Główny Urząd Statystyczny (2007), Artprice (2006).

[1] 'Conditional sales' ('conditions') are specific for the Polish auction market and occur if the hammer price does not reach the reserve price, but the owner, nevertheless, agrees to sell the object for a lower price after the auction has taken place. The existence of the so called 'condition' is marked in the post-auction results with the letter 'w' following the hammer price. According to Marek Lengiewicz, such a price discount does not exceed 20-25 per cent of the reserve price and is accepted in approximately 70 per cent of cases (interview with Marek Lengiewicz).

[2] The practice on the Polish auction market is the opposite of the one encountered at the international auction houses, where buyer's premium exceeds seller's commission. A lower buyer's premium in Poland is supposed to stimulate the demand side (interview with Marek Lengiewicz).

Similarly to trends encountered internationally, purchases in the lower end of the market predominate in Poland[126]. Most artworks purchased at auctions are created by Polish artists. In the period 1989-1998, paintings executed by foreign artists accounted only for 7 per cent of total sales (Korzeniowska-Marciniak, 2001; Sarzyński, 1999). This relatively small share is probably an outcome of the isolation of the Polish market (see section 6.3.2.Obstacles and problem issues), as well as a fairly limited supply of foreign works resulting from the country's history, buyers' unfamiliarity with international artists' oeuvre, and their mistrust of the authenticity of foreign works. However, this figure is systematically rising, with paintings of foreign origin accounting for already 13 per cent of auction houses' offer in 1999, and as much as 20 per cent in 2004 (Lewicki, 2004; Bołdok, 1998).

The auction record belongs to 'Rozbitek' by Henryk Siemiradzki, sold in 2000 for 532,000 euro (see Table 1). As compared to over 111 million euro (140 million dollars) paid

[126] In the world, the below-10,000-euro segment has a share of 90 per cent in the overall number of sales (Artprice, 2007). In Poland, various experts define the lower-end segment differently – as falling in the price range of e.g. 6,000-20,000 złoty (1,600-5,200 euro) (interview with Marek Lengiewicz), or 20,000-80,000 złoty (5,200-20,800 euro) (Zboralska, 2008).

for Jackson Pollock's 'No. 5' in 2006, this figure seems to confirm the thinness and underdevelopment of the Polish auction market. Moreover, this price most probably exceeds total worth of the Polish art market, which is estimated to fall somewhere in between 58 and 87 million euro (Mazurkiewicz, 2008).

One of the reasons why the overall market turnover, revenue and size, as well as some other figures presented in this section are hard to measure is because fictitious auctions are still a common practice at some Polish auction houses, even though their number has dropped substantially since the beginning of the 1990s (Bołdok, 2005). Therefore, in my thesis, I am forced to rely on the numbers published in the press, and on the (probably biased) rough estimates or educated guesses made by the experts and market participants. In my interview with Marek Lengiewicz, many of those figures were confirmed. Nevertheless, my interviewee admitted that the only way to precisely quantify the auction market in Poland is to check the annual financial reports of every single auction house. Moreover, another serious limitation is that the publications on the size of the Polish art market appear sporadically and some figures, especially for the earlier years, are hard to obtain. Therefore, my analysis remains at some points incomplete, and I am unable to precisely measure the extent and reflect the development of the auction market over the last 20 years.

Finally, it should be noted that the secondary market in Poland does not only consist of auction houses. The low end of the market is also formed by numerous art dealers, as well as local art fairs and market places. In this segment, virtually any type of collectible is traded, and few intermediaries specialize only in paintings, drawings and prints. Some of them occasionally organize art auctions, but on a much smaller scale than at the major auction houses. Moreover, their target is usually a different type of buyer, and, due to higher transaction costs[127], the supply is of lesser quality.

6.3.2. Obstacles and problem issues

At present, with regard to the secondary market, the major problem seems to lie in the increasingly short supply, practically in every market segment[128] (interview with Marek Lengiewicz). There are several reasons for the small and systematically decreasing supply of artworks. First of all, it is a consequence of the country's history, with war destructions having substantially limited the number of artifacts in Poland. Secondly, it can be attributed to

[127] Seller's commission charged by art dealers is around 25 per cent (Bołdok, 2004).
[128] With the exception of contemporary art.

the specific nature of the Polish auction market and its participants. Most artworks, especially those of superior quality, never appear on the market (are either a part of a public collection or are bequeathed to the family members), or rarely enter the market after the initial sale (Dobroch and Kuźmiński, 2006) (for more details on multiple sales on the Polish auction market see chapter 7 Returns on art in Poland – empirical results). Most often, art is not bought for speculative reasons, although the investment purchase motive has become increasingly important within the last years. Finally, many artworks owned by individuals living abroad have been already sold, and are thus highly unlikely to be put back on the market in the nearest future (Lewicki, 2004). The short supply results, in turn, in an increasing number of transactions involving artworks of inferior quality (Lewicki, 2008).

Another important issue that should be mentioned is that until Poland liberalizes restrictive export measures, it will remain isolated and will not become a part of the international art market. The current law on cross-border trade and movement of artworks acts as a deterrent to foreign buyers[129]. Moreover, it is a common practice that individuals trying to get an export permit at first encounter a refusal (Jarecka, 2007). The resulting uncertainty, together with potential high costs and extensive bureaucracy involved in the whole process, effectively prevent foreigners from purchasing artworks in Poland, especially those older than 55 years. More importantly, it is one of the main reasons why international auction houses are so reluctant to enter the Polish art market. With regard to import measures, since Poland has joined the EU, import of artworks is unrestricted, and involves no fees or customs duties. Nevertheless, years of isolation of the Polish art market have resulted in its marginalization in the global context. Furthermore, this has led to a situation, in which fashions and buyers' tastes are formed irrespective of the world tendencies, and Polish art (with the exception of the contemporary segment) remains fairly unknown in other countries[130] (Korzeniowska-Marciniak, 2001).

Another major obstacle to the development of the Polish art market is the restricted number of wealthy individuals that can afford to collect or invest in art, as well as a fairly

[129] According to current regulations, which are still not harmonized with the EU legislation, export of artworks requires gaining an official export permit from the Minister of Culture and paying a fee equal to 25 per cent of the artwork's appraised value for artworks whose age does not exceed 55 years, or obtaining an official document from the voivodian (general) conservator of heritage stating that a given artwork does not require an export permit for artworks whose age either exceeds 55 years (no matter whether they were created by a living or dead artist) or whose author is still alive.

[130] However, it could be equally argued that the lack of interest in Polish art on the international buyers' side is an outcome of its lesser innovativeness and art historical significance. This point of view could be supported by the fact that, when auctioned internationally, Polish artworks fetch relatively lower prices, relative to hammer prices realized in Poland.

limited number of corporate and institutional buyers (Lewicki, 2004). Most probably, with the economic development of Poland and trade restrictions being finally abandoned, this group will systematically grow, and include also more foreign collectors.

Finally, there are some major problems concerning current legal regulations that impede the maturation of the art market. First of all, unless the auction houses do not cease to organize fictitious transactions, the market will not fully stabilize and evolve. This problem was pervasive in the beginning of the 1990s, but can be still encountered, even at the major auction houses, for it offers mutual benefits to the intermediaries and consignors (Bołdok, 2005). Auction houses can report a low number of failed transactions and numerous price records, and thus attract more clients. As for the sellers, a successful auction establishes a higher price level for their work and increases its expected future market value (Lewicki, 2004). On the whole, however, this practice is harmful to the market and distorts the process of art price formation and valuation[131]. This is also the reason why any attempts to precisely quantify the size of the Polish auction market have been unsuccessful. As long as there is no law prohibiting such practices (or a consistent set of rules agreed upon and adhered to by the auction houses), uncertainty as to whether the reported hammer prices are really fetched will persist. Another burning issue is the ineffective execution of the law concerning forgeries and copies, and the lack of regulations on the extent of art experts' legal responsibility for their expertise. This is of great importance, especially when taking into consideration that, within the last years, an increasing number of forgeries has appeared on the market, especially its lower end[132] (Sarzyński, 1999). At present, the greatest risk is borne by the buyer, and, to a lesser extent, auction house. In practice, however, neither art experts, nor auction houses are held responsible for misattributions or sales of copies (Lewicki, 2004).

6.3.3. Major changes

The major change that has taken place within the last years is that the Polish art market has become more stable and less thin. Buying art is increasingly popular, and it is no longer

[131] Uncertainty among buyers of the 'true' value of an artwork is also strengthened by the fact that some auction houses do not publish pre-sale price estimates.

[132] The reasons are manifold. First of all, those works are easier to copy and artists' oeuvre is often not catalogued. Furthermore, due to high costs involved, buyers rarely order an expertise after purchasing an artwork. And even though auction houses take full responsibility for the authenticity of the auctioned objects, the risk of acquiring a forgery is still high. It is because some auction houses, driven by a profit-maximizing strategy, do not verify the authenticity of the artifacts, hoping (rightfully) that the buyer will not do it after the auction. Moreover, with the growing popularity of internet auctions and lack of potential sanctions, forgers become increasingly active in this market segment (Sarzyński, 1999).

possible for one investor to cause a major boom or slump, as it was the case in the beginning of the 1990s. However, intensive purchases on a big scale, even if made by one individual, can still create fashions, influence collectors' tastes, and generate sizeable price movements (Sarzyński, 1999).

Another important change that has occurred since the beginning of the 1990s is the appearance of young Polish artists on the international art scene and successful sales of their works. Whereas demand for the majority of Polish artworks is still generated mostly by Polish citizens, within the last decade, contemporary art has gained worldwide recognition. Foreign demand for young Polish artists has resulted in a price anomaly. Whereas contemporary art in Poland, on average, is far less expensive than other art categories, hammer prices fetched in other countries by some artworks created by young Polish artists approximate the price levels encountered in the high end of the Polish auction market[133]. The price differences seem to be even smaller when comparing international auction results of both art categories. It is because Polish masterpieces usually fetch lower prices when sold abroad. This anomaly can be explained by the co-existence of several factors. First of all, many artworks, especially those of lesser quality or art historical significance, are in the highest demand in the countries of origin (de la Barre et al., 1994), for they can be appreciated most by the national buyers[134]. Furthermore, on average, contemporary art is priced lower than the modern art segment. Finally, there are some artistic movements and periods, and that includes contemporary art, which are still undervalued on the Polish art market. Actually, with the exception of some successful artists, contemporary art is often priced way below its 'true' value. Moreover, prices in this segment increase at a slower rate, relative to the high end of the market, which is, among others, an outcome of the past system of fixed prices. It created many anomalies on the market, some of them still present today (Sarzyński, 1999) (see section 6.6.Future developments). However, even though big discrepancies between the price levels of contemporary and high-end artworks can be observed in Poland, this gap seems to be slowly diminishing, largely due to the international success of several young Polish artists. How unknown Polish art still remains and how few Polish artists enjoy international renown is best

[133] High end of the market includes works created by members of École de Paris and 'Munich school', as well as some modern classics active at the end of the 19th and beginning of the 20th century.

[134] This can be due to e.g. context-specific subject, historical significance, domestic renown of the artist, and country-specific tastes or fashions.

illustrated by the fact that only 16 of them are featured among top 2000 artists in 2007 Artfacts.net ranking[135].

A further major change that has occurred over time refers to the demand side. Whereas in the beginning of the 1990s, the average buyer was an uninformed new rich, whose sole purchase motive was to advance her social position, at present, it is a conscious, well-informed, wealthy individual, very often possessing extensive art historical knowledge. Unfortunately, common tastes in Poland still remain pretty conservative and can be easily influenced by short-lived fads and fashions (see section 6.4.Buyers and their tastes). However, within the last years, there seems to have emerged a small group of art collectors, who do not only create high-quality collections and support Polish artists, but also indirectly shape and educate buyers' preferences and tastes[136]. In addition, although an increasing number of institutions and corporate buyers want to acquire art, their demand is still fairly limited.

While most Polish buyers purchase art for consumption benefits, there has been a growing interest in art as an alternative investment class. Although financial calculations were probably behind many purchases made by the new rich in the beginning of the 1990s (Sarzyński, 1999), the intention to invest money into art has been reinforced by the well-publicized auction records, but also the increasing wealth of Poles and resulting appearance of some art investment-related services (e.g. art banking). Moreover, the favorable situation on the international art market and booming art prices – a trend that slowly sets in also in Poland, create promising perspectives for art investment.

Finally, a fact worth noting is that Art NEW media, a partnership that deals in art (it owns a Warsaw-based commercial gallery), publishes an art magazine *Sztuka.pl* and offers art-related services (such as art consultancy, art investment and art management) has recently announced its plans to gather capital by entering NewConnect – an alternative trading system, operating within the Warsaw Stock Exchange. Therewith, it would become the first art enterprise to be traded on the Polish stock market and thus enable indirect investment in art. If the debut proves successful, it may encourage other companies to get involved in art investment. Moreover, since the company intends to spend the obtained capital on acquiring a

[135] Those are (ranks are given in the brackets): Wilhelm Sasnal (299), Paweł Althamer (445), Mirosław Bałka (477), Piotr Uklański (498), Monika Sosnowska (602), Katarzyna Kozyra (674), Artur Żmijewski (692), Roman Opałka (760), Magdalena Abakanowicz (1269), Józef Robakowski (1280), Krzysztof Wodiczko (1396), Zbigniew Libera (1788), Edward Krasiński (1816), Władysław Strzemiński (1844), Leon Tarasewicz (1915), Marcin Maciejowski (1939). Another 2 artists listed among top 2000 – Aleksandra Mir (440) and Hans Bellmer (294), even though identified as Polish (according to the place of birth) by Artfacts.net, are not Polish artists.

[136] One should name i.a. Grażyna Kulczyk, Krzysztof Musiał, Dariusz and Krzysztof Bieńkowski, Andrzej Walczak, Witold Zaraska, Piotr Voelkel, Wojciech Fibak.

collection of young Polish art (Sztuka.pl, 2008), it seems that Art NEW media sees good prospects for the art market and anticipates a growth in demand for art in Poland.

6.4. Buyers and their tastes

In contrast to other Western markets, in Poland, artworks are bought mostly by private individuals, whose purchases probably account for over 90 per cent of total sales (Studziński, 2008b). Polish buyers are driven mostly by consumption, rather than investment motives. Moreover, there are vast differences between the types and preferences of buyers in the high and low end of the market.

As already mentioned, the beginning of the 1990s was a time of quick rises (but also falls) of new fortunes. The new-rich class formed most of the demand for art and its purchases were usually uninformed. Virtually any price level was accepted, which resulted in a steep rise in art prices. The only thing that mattered was artist's name and how much prestige would it bring to the new owner (Sarzyński, 1999; Naszkowska, 2007). The breaking point was the slump generated by the bankruptcy of Art-B holding. Paradoxically, it resulted in a rationalization of buyers' behavior. They realized that not every artifact is worth each price, and there are differences in quality not only between particular artists and artistic schools, but also within an artist's oeuvre. Since then, prices have come to reflect artwork's 'true' value to a greater extent, although it is still not the case for some overpriced popular movements.

Today, a typical customer of a major auction house is a wealthy individual (most commonly a businessman, manager, lawyer, etc.), or a successful young person in her thirties, with an above-average income. The first group has rather conservative tastes and usually purchases expensive modern artworks (e.g. École de Paris, 'Munich school'). Buyers prefer genre subjects, which often refer to viewers' sentiments, patriotism or national identity (e.g. major historic events, battles, sporting and hunting scenes). Poles also appreciate decorative artworks, such as landscapes, still lives with flowers, or women acts. Another characteristic feature of Polish tastes is the love of horses – in 1996, one in eight auctioned paintings featured this animal (Sarzyński, 1999). In general, the decisive factors for the popularity of an artwork in Poland include: country-specific subject, decorativeness and creator's renown. If more recent and less conservative art is purchased, buyers' choice is usually restricted to one of the few most popular modern artists[137]. Avant-garde, abstract, non-figurative, or conceptual

[137] This refers in particular to Jerzy Nowosielski. The ongoing and ever increasing popularity of his oeuvre can be partly attributed to the intensive promotional efforts of his 'mother' gallery Starmach. It shows that Polish

modern and contemporary works, as well as less common media are not in high demand (ibid.). Therefore, this group of buyers forms the demand in the high end of the market. The opposite can be said of the latter group – wealthy, successful individuals, now in their thirties. They are open to artistic innovations and unconventional media. Although they also acquire artworks for consumption benefits, they purchase predominantly contemporary art, created preferably by young Polish artists. As this market segment is to a large extent undervalued, purchases are made usually in the low end of the market. However, with the growing worldwide popularity of several young artists, the last years have witnessed a rapid increase in prices of works created by artists with the already internationally established reputation. Therefore, purchases of this group have partly moved to the mid-price range.

Finally, it should be noted, that Polish buyers' choices are still largely guided by artist's name and popularity (Sarzyński, 1999). This can be explained by the herd behavior of the uninformed buyers, but also the underlying willingness to economize on information and search costs. Moreover, fashions are selective in manner, and set in only for a limited number of artists – even within the most popular movements, some artists fetch top prices, whereas other equally, or even more talented remain unappreciated. On the other hand, fads usually inflate prices also for some artworks of lesser artistic quality. However, those tendencies, although of greater magnitude in Poland, can be observed on other markets as well. Finally, Polish buyers still have problems with valuing artworks that have never appeared on the art market. With no previous prices as reference points, they tend to underestimate their worth (Lewicki, 2004).

In the last years, the presence of institutional buyers on the Polish art market has become increasingly notable, although their share in the total number of sales remains pretty low[138]. However, they do not perceive art as an investment asset (Dobroch and Kuźmiński, 2006). Purchases are made most commonly for motives of prestige, and usually aim at improving corporate image, extending the art collection, or supporting Polish art scene.

Another change concerning the demand side that has occurred within the last few years is the growing number of foreign buyers, particularly of Ukrainian and Russian nationality. As to the latter group, this is in line with the world tendencies, and concerns only works created by artists associated in some way with Russian culture (Lewicki, 2004).

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buyers' tastes can be influenced even by one individual – in this case, the gallery owner. Another good example is the popularity of École de Paris, which is an outcome of the marketing strategy of a well-known collector, Wojciech Fibak (Sarzyński, 1999).

[138] Those include ING and Polish banks, such as Pekao S.A., PKO BP, Kredyt Bank, and former BPH.

6.5. Art-related services

With the increasing wealth of Poles and especially after having entered the EU, several art-related services have appeared in Poland. They are offered by companies active not only on the art, but also financial market. Although the scale and scope of those services is still fairly limited (e.g. there are no art investment funds or insurance companies specializing in artworks), stable economic growth, rising wealth of Poles, and increasing number of individuals potentially interested in collecting or investing in art, will stimulate their further development.

6.5.1. Art rental

Within the last few years, several firms offering art rental services have come to existence[139]. Most customers, predominantly corporate, rent paintings, but the offer includes also other categories of collectibles, such as furniture or sculptures (Borowski, 2007c). Similarly to other countries, art is usually rented to improve corporate image, for publicity, prestige, or decorative reasons.

6.5.2. Art banking and art investment

Art banking was initially offered in Poland by the Swiss UBS – one of the market leaders in investment banking, and the first bank to have included this type of service in its offer. In Poland, quasi-art banking services were first launched by Pekao S.A. It provides its clients with the opportunity to participate in the Private Consulting program, which enables them, among others, to purchase artworks under preferential conditions, use free expertise and advice, or attend seminars devoted to art (Cegłowski, 2008; Żelazek, 2007). At present, full art banking services are offered only by Noble Bank – the first Polish bank for high-net-worth clients, which cooperates with one of the major auction houses, DA Desa Unicum.

Wealthy individuals interested in art banking or art investment can also choose between New World Alternative Investments and Stilnovisti Art & Wine Banking, which offer financial advisory services and alternative investment vehicles. 2008, the former enterprise founded New World Art Collectors – the first Polish company to specialize in art

[139] For example, the Warsaw-based ArtOffice.

investment (Money.pl, 2008). What distinguishes Stilnovisti Art & Wine Banking is that, besides providing complex art-related services (e.g. expertise on art investment, assistance in creating a collection, art management), as a part of its art banking services, it supports artists by funding special scholarships (Cegłowski, 2008).

Unfortunately, as those companies and financial institutions protect privacy of their customers, it is hard to verify whether art banking in Poland is popular and successful. According to Noble Bank, around 10 per cent of its clients showed interest in this type of services (Mazurkiewicz, 2008). 2007, turnover in the art banking segment amounted to 18.5 million euro (Chyła, 2008). This fairly small figure shows that the best times are yet to come. Among the most important problems impeding the development of this sector the experts name low liquidity and a very limited number of institutions that include art banking in their offer. Nevertheless, the growing interest among clients makes the experts optimistic about the prospects for art banking services (ibid.).

6.5.3. Art insurance

Art insurance segment is still underdeveloped in Poland. Although some companies provide it on client's request, they do not include it in their standard offer, nor specialize in this field (such as e.g. AXA). Annual insurance costs are estimated to amount to 2.5 percent. This relatively high figure acts probably as a deterrent to potential customers. Another factor that constrains the demand are the high additional costs imposed on clients by insurance companies (Gieros, 2005).

6.6. Future developments

One of the major developments that will hopefully take place in the future is the internationalization of the Polish art market. With the liberalization of the art trade and market maturation, Poland will slowly approximate Western standards. Moreover, international success of some young Polish artists, and the promotional tools employed by several art galleries will further strengthen interest in Polish art, as well as attract foreign collectors to the domestic auctions.

The most probable scenario to be realized in the next few years is a decrease in the number of auction houses present on the Polish market. The current thinness of the art market, its isolation and limitations, both on the demand and supply side, will seriously affect the

secondary market, since there is evidently not enough room for so many enterprises as there are at the moment (interview with Marek Lengiewicz; Bołdok, 2005). In the long run, the auction market structure could be changed either as a result of the increasing competition between the auction houses, or entrance of foreign players. On the other hand, it is possible that, with booming art prices, even the least efficient enterprises will generate sufficient revenue to avoid bankruptcy. Any forecasts on this matter are highly uncertain, for the only way to verify the actual performance of the auction houses would be to examine their financial statements, which is a result of the unfortunately still present practice of organizing fictitious auctions. Hopefully, as buyers become increasingly aware and experienced, or with the introduction of some regulatory measures, this problem will disappear in the upcoming years.

Furthermore, a rise in demand and decreasing market isolation will result in the auction houses beginning to organize separate auctions of works from different market segments. This process has been already initiated by DA Rempex, soon followed by DA Agra-Art, which hold individual auctions of Old Masters, and modern and contemporary art. Another example worth mentioning is Rynek Sztuki, which, besides auctioning art in general, specializes in photography and contemporary works of young Polish artists. Other auction houses also begin to develop their offer in line with this trend.

Within the next years, the market will probably adapt a more rational approach towards valuation and pricing of artworks, which will, in turn, generate greater predictability of prices. As buyers become well-informed and educated, many lots of lesser quality remain unsold, whereas several years ago there would have been someone eager to purchase them. Buyers' tastes will further evolve, which will have a grave impact on the popularity of particular subjects, artists, artistic movements and media (Sarzyński, 1999). Moreover, it will become increasingly hard to influence tastes by using simple promotional tools. With the unavoidable trade liberalization, many Polish artworks of inferior quality that are now still in high demand and fetch extraordinarily high prices will be substituted by cheaper works of higher quality created by foreign artists. Furthermore, prices will reflect artifact's quality to a greater extent – minor works within an artist's oeuvre will reach lower prices and some undervalued artists, artistic periods (e.g. artworks created before the 19th century, Polish works from the mid-war period, or the 1960s, 1970s and 1980s) will become more appreciated (ibid.). Finally, the excessive price discrepancies between the contemporary and masterpiece segment will become less significant over time.

Another major change to occur in the future is the development of the art investment sector. This is correlated not only with buyers' wealth, but also the maturation of the art market. As demand for such services is still very limited and the art market thin, some time will pass before other financial institutions include them in their offer.

Irrespective of the developments in the art investment sector, art-related companies will start to offer complex services aimed at advising their clients on the optimal composition of the collection, its maintenance, insurance, etc., as well as managing the collection so as to increase its market value. For the time being, there are only two companies and two banks that offer such services.

Polish art market is said to be at the stage, at which the market for real estate was at the turn of the century (Noble Bank, 2006). Since then, the latter has undergone an extraordinary boom. If this scenario proves to be true for the art market, the best years are still to come.

7. Returns on art in Poland – empirical results

7.1. Introduction

This chapter is an empirical study devoted to art investment in Poland, in particular returns on artworks that appeared at Polish auctions in the period 1990-2004. First, I present the hypothesis that will guide me through the empirical part of my thesis. Second, I discuss data sources and the underlying sample, i.e. artifacts that were sold at least twice within the given period. Next, the applied measurement method is analyzed and a refined version of the double-sales approach developed by Baumol (1986) is proposed. In the following parts, I introduce the findings on the financial performance of artworks auctioned in Poland between 1990 and 2004, and compare art with alternative forms of investment. In addition, in order to put my results in a broader context, some selected outcomes of the previous studies are presented. Furthermore, in line with my hypothesis, I examine whether the underdevelopment of the Polish auction market generates anomalies of greater magnitude, relative to other markets, and thus creates the opportunity to reap above-average gains. I center my focus on three particular phenomena, namely the 'masterpiece effect', 'winner's curse' and violation of the 'law of one price'. Finally, I discuss the major limitations and obstacles to my study, and suggest some potential areas of future research.

7.2. Hypothesis

In their recent paper, Pesando and Shum (2008, p.10) quote Bruce Taub, the chairman of the no longer existing Fernwood Art Investments, who wrote: 'The least efficient markets offer the greatest opportunity for performance – provided that the investor has some kind of information advantage and/or ability to enhance value.' Although the intention behind this statement was to describe the mechanisms driving the global economy in general, I think it is equally relevant to the workings of the art market.

It is assumed that the emerging economies and their financial markets in particular offer investors a chance to reap extraordinary gains. This is because the substantial risk involved in trading on a developing market may be rewarded by accordingly higher returns. It is probable that a similar pattern could be observed on the art market. As already noted in the previous chapters, there is abundant evidence for the inefficiency of the art market and

persisting presence of some art market-specific anomalies, which might create opportunities for arbitrage.

Therefore, I would like to present the following hypothesis – a fairly underdeveloped art market, such as the Polish auction market, similarly to an emerging economy, might offer investors a chance to reap extraordinary gains. Moreover, its immaturity may also magnify the art market-specific anomalies, which could serve, in turn, as a source of superior gains, but at the same time generate the risk of making substantial losses.

In order to test whether this holds in the case of Poland, I will first examine the monetary appreciation of artworks sold on the Polish auction market since the fall of communism and compare it with returns on alternative asset classes. In order to further assess the financial performance of art auctioned in Poland, relative to other auction markets, I will also put my findings in the context of some previous studies. This approach towards analyzing the returns on art will be also supplemented by the examination of several anomalies, typically encountered on more mature markets, namely the 'masterpiece effect', 'winner's curse' and violation of the 'law of one price'. This will allow me to check whether their potentially greater magnitude can be advantageous to individuals willing to allocate their means into art.

To the best of my knowledge, thus far no research on the relationship between the maturity and efficiency of the art market, and financial performance of art has been carried out. Moreover, this is probably the first attempt to analyze investment potential of art auctioned in Poland. With this study, I hope to contribute to the present state of the knowledge.

7.3. Data

For the purpose of this study, data was drawn from the three-volume compendium 'Malarstwo na aukcjach w Polsce' created by Bołdok (1998, 2001, 2005), which comprises a large part of the auction results compiled almost since the birth of the Polish auction market[140]. It contains auction data for the periods 1990-1997, 1998-2000 and 2001-2004, either taken from the pre-auction catalogues and post-sale price lists, or collected directly at

[140] All three volumes use data collected by the author and published annually in *Art & Business* magazine. This data set, although spanning over the whole period of 20 years since the beginning of the Polish auction market, is particularly ill-suited for tracking repeat sales, because it consists of separate volumes. Due to time constraints, I have decided to use Bołdok (1998, 2001, 2005), since it facilitates the process of identifying pairs of transactions. The resulting drawback is that I am forced to restrict the period under study to the years 1990-2004.

auctions[141]. It provides an alphabetic list of artists (together with the name, last name, year of birth and death) and relevant auction results. Each record provides information on the title, date of execution, dimensions, technique, medium and support, whether the work was signed and/or dated, its initial price (price, from which the bidding departed), hammer price, date of sale and auction house[142]. In order to enable comparisons over time, all hammer prices are quoted after denomination (i.e. after subtracting four zeros at the end of each number)[143].

For the period 1990-2004, I have found 522 pairs of sales of 464 works created by 220 artists[144] (for the whole data set see the attached CD-ROM). Due to some problems with identifying some objects, I was forced to discard 50 double sales. Moreover, after having made all the calculations, I have decided to remove another 3 observations from the sample, since they significantly distorted the obtained results. The following table contains detailed information on the repeat-sales data.

Table 1: Summary statistics on repeat sales on the Polish auction market in the period 1990-2004

	Number	**Share**
1. Number of works	464	
Polish	442	95.26%
Foreign	22	4.74%
Contemporary Polish	9	1.94%
Contemporary foreign	1	0.22%
2. Number of masterpieces (hammer price above 0.2-million-zloty benchmark)	28	6.03%
3. Number of artists	220	
Polish	199	90.45%
Foreign	21	9.55%

[141] Although it might seem, at first, that an analogy between Bołdok (1998, 2001, 2005) and Reitlinger (1961, 1970) could be drawn, in reality, there are vast differences between both databases, mostly with regard to the degree of comprehensiveness, objectivity and completeness of the data.

[142] In some cases, however, information on the medium, technique and support, or year of execution was missing.

[143] It took effect on 1st January 1995.

[144] For comparison, previous papers that apply repeat-sales regression to study returns on artworks sold at least twice within a comparable period of time obtain the following numbers of double sales: 20 for the period 1980-1990 in Mok et al. (1993) and 27,961 for the period 1977-1992 in Pesando (1993), but the sample is bigger due to the multiple nature of prints. For much longer periods, Mei and Moses (2002a) identify 4,896 sale pairs (1875-2000) and Goetzmann (1993) finds 3,329 such pairs (1715-1986). On the other hand, using Reitlinger data, Baumol (1986) obtains only 640 double sales for a much longer period of 1652-1961.

Contemporary Polish	6	2.73%
Contemporary foreign	1	0.45%
4. Number of double sales	522	
Polish	499	95.60%
Foreign	23	4.40%
Contemporary Polish	9	1.72%
Contemporary foreign	1	0.19%
Masterpieces	38	7.28%
0-3 years	317	60.73%
0-2 years	256	49.04%
0-1 year	153	29.31%
1-2 years	103	19.73%
2-3 years	61	11.69%
3-5 years	94	18.00%
5-10 years	99	18.97%
10-15 years	12	2.30%
5. Number of double sales excluded from the sample	53	
6. Number of double sales at the same auction house	232	44.44%
7. Number of double sales with a loss	144	27.59%
8. Number of double sales with no change in value	22	4.21%
9. Number of double sales with a gain	356	68.20%

Source: own calculations based on data drawn from Bołdok (1998, 2001, 2005).

7.4. Measurement method

In order to calculate the rate of return on art auctioned in Poland in the period 1990-2004, I use double-sales (geometric repeat-sales) approach. This method, developed by Baumol (1986), and utilized by Frey and Pommerehne (1988, 1989a), and Landes (2000), applies the standard continuous compounding formula to estimate the annual rate of return on

objects sold at least twice in a given period. Although it does not allow the construction of an index, it is well-suited for calculating returns on art investment.

In the continuous compounding formula[145], the natural logarithm of the price relationship is calculated for each pair of sales (i.e. natural logarithm of the hammer price from the later sale minus the natural logarithm of the hammer price from the earlier sale). It is then weighted by the length of the holding period expressed in years. This can be written as:

$$r = (\ln p_t - \ln p_{t-1}) / (t_1 - t_o) = \ln(p_t / p_{t-1}) / (t_1 - t_o)$$

where r is the annual nominal rate of return on a pair of transactions, $(t_1 - t_o)$ is the holding interval between the initial purchase and resale expressed in years (i.e. year of resale minus year of purchase), and $\ln(p_t / p_{t-1})$ is the natural logarithm of the ratio of the hammer prices fetched by the resale (p_t) and purchase (p_{t-1}), which reflects the percentage change in price over the relevant holding period. The annual nominal rate of return is then calculated by adding up all the nominal rates of return on double sales and dividing their sum by the number of transactions pairs.

Although Baumol (1986) and other authors define the holding period as a difference between the year of resale and purchase, I propose a more fine-grained formula. The major limitation of Baumol's approach is that it gives equal weights to returns yielded within substantially different holding intervals (e.g. eleven and eighteen months)[146]. In order to obtain reliable results, any holding period of less than one year should be discarded, since otherwise the natural logarithm of the price ratio would have to be divided by zero. Therefore, I refine Baumol's method and calculate the rate of return based on a more precisely expressed holding interval (but still given in years) – i.e. the number of months between subsequent sales divided by the number of months in a year. This allows me to include in the sample also those transactions that occurred within a year. Although ideally one should use the number of days instead of months, this method also leads to fairly accurate results. One major caveat to applying the refined method is that it is ill-suited for estimating returns yielded within the ultra-short holding periods, especially of less than a month, since it may significantly bias the

[145] The continuous compounding formula I present here is a transformed version of the one initially developed by Baumol (1986), i.e. $p_t = p_{t-1} e^{r (t_1 - t_0)}$.

[146] Let us assume that an individual purchases an artwork in March 2002 and resells it after eleven months (i.e in February 2003), whereas another buyer, who acquired a work on the same date, holds it for eighteen months (i.e. till September 2003). In line with Baumol (1986), both holding periods equal one. As a consequence, the returns on both works should be perceived as returns yielded within one year and should be thus given the same weights – an assumption that significantly biases the obtained results.

obtained results. Therefore, one should be careful to detect the outliers in advance and remove them from the sample. This is also the case in this study, with three works resold within less than a month significantly distorting the outcomes. Therefore, in order to avoid a bias, I have decided to remove those observations from the sample. In general, however, since such highly speculative purchases are rather atypical for the Polish auction market, omission of those pairs of transactions should not affect the general outcomes.

7.5. Results

7.5.1. Returns on art

During the period 1990-2004, the annual nominal rate of return on artworks auctioned in Poland averaged 7.14 per cent. This is much less than the rate of return on 180-day Treasury Bills, which averaged 21.13 per cent annually in the period 1991-2004[147], and the general Warsaw Stock Exchange index WIG, which yielded on average 88.19 per cent per annum between 1991 and 2004[148]. However, it should be noted that there is an inherent upward bias in the latter number, generated by the extraordinary growth of the index in 1993. When disregarding this particular year, the average annual rate of return on stocks drops to only 10.72 per cent. The relative underperformance of art becomes even less clear when considering the fact that the WIG20 index, which tracks share price movements of top 20 blue chip companies, yielded on average 14.47 per cent annually in the period 1995-2004, whereas the average annual nominal rate of return on masterpieces was 19.72 per cent between 1990 and 2004.

The average annual inflation rate for the whole period under study amounted to the stunning 58 per cent. This is because in the early 1990s, Poland experienced hyperinflation and, until 1999, the annual inflation rate remained beyond the 10-per cent level. Only within the last few years has the inflation rate stabilized at a fairly moderate level. As a consequence, it might be pointless to consider the real rate of return on art auctioned in Poland between 1990 and 2004, since it would significantly underestimate its performance, especially for the

[147] This surprisingly high figure results from the fact that, for a long time, the rate of return on 180-day Treasury bills was established based on the inflation rate, which, especially in times of hyperinflation, substantially enhanced the financial performance of this instrument. However, in 2003 and 2004, it stabilized at a fairly moderate level of around 5 per cent.

[148] Unfortunately, I am unable to compare the financial performance of artworks and alternative assets over the whole 15-year period, since 180-day Treasury bills and WIG index were introduced in 1991, whereas WIG20 was developed in 1995.

earlier part of the period under study. Therefore, I have decided to limit my analysis only to the returns on art expressed in nominal terms. In the following table, the annual average nominal rates of return on art and major financial assets in Poland are listed[149].

Table 2: Average annual nominal rates of return on art and major financial assets in Poland in the period 1990-2004

1. Art in general	7.14%
2. Masterpieces	19.72%
3. Contemporary art (Polish and foreign[1])	2.75%
4. Foreign artworks	6.63%
5. WIG (stocks in general) (1991-2004)	88.19%
6. WIG (stocks in general) (1991-1992 and 1994-2004)	10.72%
7. WIG20 (top 20 stocks) (1995-2004)	14.47%
8. 180-day Treasury bills (1991-2004)	21.13%
9. Inflation	58.00%

Source: own calculations based on Bołdok (1998, 2001, 2005), http://www.stat.gov.pl/gus/45_1634_PLK_HTML.htm, visited on 28.06.2008, http://www.gpw.pl/zrodla/informacje_gieldowe/statystyki/Gpwspl.html, visited on 28.06.2008, http://www.money.pl/pieniadze/bony/archiwum/, visited on 28.06.2008.

[1] I calculate the rate of return on contemporary art on the aggregate level (i.e. for both Polish and foreign works) since, due to the limited number of foreign artworks, disaggregating the sample of contemporary works would bias the results.

On the whole, even though, at first, art seems to perform rather poorly, there are some major caveats to such an interpretation. First of all, with the onset of the free market economy in Poland, the new-born financial market lacked stability, which often resulted in exceptionally high rates of return on alternative assets, especially stocks. Moreover, financial performance of some forms of investment was further positively affected by hyperinflation. As a result, in the early 1990s, investors would have preferred equities or securities to artworks. However, it is possible that by disaggregating the data and comparing returns on different alternative assets on the annual basis, a picture more favorable to art would emerge. Finally, it should be noted that the average underperformance of artworks in general does not preclude the existence of the above-average rates of return on some particular art categories.

[149] For the means of comparison, I also include the inflation rate calculated for the whole period under study.

In fact, high returns on the masterpiece sample indicate that some market segments might have offered investors a chance to reap extraordinary gains. Moreover, I believe that the fairly modest rate of return on contemporary artworks should be interpreted not only as a proof of its past underperformance, but, more importantly, its current undervaluation. Considering the fact that the double sales of contemporary works account for less than 2 per cent of the total number of transaction pairs in the studied sample, it seems highly probable that this market segment is likely to undergo a boom in the future. With buyers learning to appreciate this art category over time and the growing international renown of some young Polish artists, contemporary artworks will be auctioned more often and enjoy greater demand, which will lead to an increase in prices and, as a consequence, enhance the returns.

Finally, in order to shed more light on my results, I compare them with the outcomes of other papers investigating similar time periods. Most authors[150] obtain rates of return higher than those calculated in my study. However, this relative underperformance of art auctioned in Poland could result from the fact that researchers usually focus on the boom period that occurred in the end of the 1980s and beginning of the 1990s. Therefore, it seems that the most appropriate for the means of comparison is the figure calculated by Campbell (2007). Based on the Art Market Research general art index and with the use of the continuous compounding formula, for the period 1990-2006, the author estimates the average nominal rate of return on art to amount to only 1.26 per cent. This puts my findings in a more favorable context. Moreover, since Art Market Research indices track the condition of the international auction market, this might indicate that art auctioned in Poland during the period under study might have actually outperformed artworks sold on the international auction market.

7.5.2. Anomalies

In line with my hypothesis, I also examine whether the immaturity of the auction market in Poland is also accompanied by greater anomalies, which might enable an individual

[150] Those include: 10.5%, 14.0% and 9.0% for Flemish-Dutch, French and Italian Old Master drawings auctioned in the period 1980-1991 calculated by Ginsburgh and Schwed (1992), 52.9% for modern Chinese paintings auctioned in the period 1980-1990 calculated by Mok et al. (1993), 9.3% for American paintings auctioned in the period 1971-1992 and 4.3% for the period 1980-1992 calculated by Agnello and Pierce (1996), 8.6% for 19th century European paintings auctioned in the period 1982-1992 calculated by Fase (1996), 12.0% for Picasso prints auctioned in the period 1977-1993 calculated by Pesando and Shum (1996), 9.0% and 8.6% (depending on the measurement method) for Belgian paintings auctioned in the period 1980-1997 calculated by Renneboog and Van Houtte (2002).

to reap extraordinary gains through arbitrage. I center my focus on the 'masterpiece effect', 'winner's curse' and the impact of the holding interval on the rate of return, as well as the violation of the 'law of once price'. This choice is dictated by the fact that the remaining anomalies would require collecting detailed information on the lot ordering, buyer type, pre-auction price estimate, or failure to sell at an auction, which is hard or impossible to obtain in Poland.

7.5.2.1. 'Masterpiece effect'

First, I examine the existence, potential direction and magnitude of the 'masterpiece effect'. I define masterpieces as works, whose hammer price exceeds the 0.2-million-złoty benchmark, which leaves me with a sample of top 6 per cent of the artworks ordered by price[151]. In line with my expectations, I observe a strong above-average performance of masterpieces, i.e. 19.72 per cent, which is over 12 per cent beyond the return calculated for artworks in general. This finding is of particular importance, since thus far the only two studies to have observed a positive 'masterpiece effect' for the sample defined by price are Agnello and Pierce (1996), and Agnello (2002). However, one should bear in mind that this finding is based on the historical data and may be also interpreted as a proof of past greater undervaluation of top-quality art, relative to other market segments. Therefore, in the future, the market value of masterpieces might reflect their 'true' value more closely, which would preclude the possibility to reap extraordinary gains by purchasing the most expensive artworks.

7.5.2.2. 'Winner's curse'

I also investigate whether the length of the holding interval has an impact on the rate of return, in particular, whether there exists the 'winner's curse'. In line with my expectations, this seems to be a pretty common phenomenon on the Polish auction market. Out of all the transaction pairs that generated a loss (i.e. 28 per cent of the total number of double sales), half were resold within a year and over 77 per cent within two years[152]. The following table

[151] This is also in line with Pesando and Shum (2008), who define the initial masterpiece sample as top 5 per cent of artworks ordered by price.

[152] This might suggest the speculative nature of the Polish auction market. However, it should be borne in mind that it refers only to a part of purchases made on the Polish auction market, since the majority of works sold at an auction in Poland between 1990 and 2004 did not reappear on the market.

contains detailed data on the holding interval of works that depreciated in value within the period under study.

Table 3: Holding interval of double sales that generated a loss in the period 1990-2004

Holding period	Number	Share
0-1 years	72	50.00%
1-2 years	39	27.08%
2-3 years	18	12.50%
3-5 years	12	8.34%
5-10 years	3	2.08%
Total	144	

Source: own calculations based on data drawn from Bołdok (1998, 2001, 2005).

Those numbers suggest that the probability of making a loss on a purchased artwork may be negatively correlated with the holding interval. It is very high within a year after the initial purchase, and decreases significantly with every additional year. In order to avoid drawing incorrect conclusions, I also check (by examining the dates of particular sales) whether the 'winner's curse' is not associated with unfavorable changes in price trends on the art market. This, however, does not seem to be the case, since most artworks that depreciated in value over time were not purchased at the peak of the boom period and then resold during a downturn (although there were also such instances).

7.5.2.3. Violation of the 'law of one price'

Finally, I examine whether there is evidence for the violation of the 'law of one price'. For this purpose, I analyze all the double sales that occurred within an ultra-short period of less than two months[153], including the transaction pairs that were originally removed from the sample. Although works that reappeared on the market at such a short time interval were

[153] The authors that analyze the 'masterpiece effect' usually use a 30-day window. However, due to a smaller sample, I use a more flexible time frame. I also consider artworks that were initially removed from the sample, since they reappeared on the market within less than a month.

usually purchased and resold at the same auction house and/or depreciated in value, in two instances (one of them was initially excluded from the sample) I observe that the artworks both appreciated over time and were put back on the market with the intermediation of a different auction house. This may suggest that the 'law of one price' does not hold for the Polish market, which would be also in line with the common findings of other studies. However, the small number of cases that might support the existence of this anomaly and the underlying data set do not allow me to draw any final conclusions on this matter. This is especially because the more commonly occurring negative changes in value could be also interpreted as the 'winner's curse', rather than the violation of the 'law of one price'[154].

To sum up, I do find some evidence for the relatively greater anomalous nature of the Polish auction market. In fact, thus far very few authors observe the existence of a positive 'masterpiece effect' or 'winner's curse'. Therefore, it might be the case that the immaturity of the Polish auction market may generate greater anomalies, which might, in turn, offer investors a chance to reap extraordinary gains. Moreover, even though, at first, art seems to underperform alternative forms of investment, I argue that this could be attributed to the initial instability of the Polish financial market and resulting temporary superior performance of financial instruments, relative to artworks. It is possible that on the disaggregate level art might actually outperform other alternative asset classes. Actually, when compared with artworks sold internationally in a similar period, art auctioned in Poland turns out to yield substantially higher returns.

Finally, although I am unable to draw any final conclusions on the violation of the 'law of one price' on the domestic auction market, I do believe that this anomaly would be detected, if hammer prices in Poland were compared with those realized internationally. Therefore, it is possible that the highest gains could be reaped through arbitrage between the Polish and international auction market. As already mentioned, Polish contemporary art is still fairly unappreciated and undervalued in Poland, whereas some young Polish artists enjoy a high international renown, which is also reflected in high hammer prices fetched by their works on the international market. Therefore, it may be that some Polish contemporary artworks purchased in Poland and resold abroad could have yielded the highest returns. Nevertheless, this assumption cannot be verified empirically, since those works did not appear at auctions in Poland in the period 1990-2004. This implies that a study based on the potential

[154] The problems with drawing any final conclusions on the 'violation of one price' also result from the fact that most auction houses have comparable reputation and are located in the same city (i.e. Warsaw).

double sales of those artifacts and the resulting rates of return would require extending the research to the primary market, which is beyond the scope of this thesis. Moreover, in general, there were only 10 contemporary works of art that reappeared on the Polish auction market between 1990 and 2004, and I doubt whether any of them has left the country, since they were not created by internationally recognized artists. Finally, it is possible that the above-average gains could be reaped through cross-border arbitrage also in other market segments, but with arbitrage working in the opposite direction, i.e. artworks being bought abroad and resold in Poland[155]. As already mentioned in chapter 6, this is because demand for those works and, therewith, their prices are lower in other countries, relative to the Polish auction market.

7.6. Limitations and obstacles

As already noted in chapter 2 (section 2.3.Limitations and shortcomings), there are many limitations to studying financial performance of art based solely on auction data. Therefore, all the previously mentioned shortcomings of art investment literature are also inherent to my study. In addition, by applying the double-sales approach and considering only works that reappeared on the market within a certain period, my study is exposed to the limitations of repeat-sales method, such as the sample selection and 'survivorship' bias (see chapter 4 Art investment, section 4.2.1.Repeat-sales regression). Therefore, it may be that the outcome of my calculations might be biased and unrepresentative for the whole auction market (not to mention the whole art market), as a result of disregarding all the artworks that were sold only once between 1990 and 2004. On the other hand, it might be argued that the relatively high number of double sales that occurred within such a short period suggests that this limitation, although still important, could be of lesser concern in the case of the Polish auction market.

Another serious drawback of my study may result from the potential failure to identify and include some double sales in the sample. Since there is no database containing all the auction results for the entire period 1989-2008, I was forced to track all the repeat sales with the use of auction records collected by Bołdok (1998, 2001, 2005). The advantage of this data source is that it compiles data on all the objects that were hammered down between 1990 and 2004. However, it sometimes lacks or contains erroneous information on the date of execution, dimensions, medium, support or technique, which makes it hard to identify double

[155] This might especially be the case since Poland has entered the EU in 2004, since it implied the abolition of import restrictions and, therewith, any resulting fees or customs duties.

sales of the same objects. Moreover, some titles and dimensions change across volumes, which further impedes the process of identification of particular artworks and transaction pairs[156]. Finally, the author himself sometimes does not detect multiple sales of the same object, and records them as sales of two (or more) different artworks. Therefore, it should be taken into account that I might have failed to notice and include some sale pairs in the sample. In some doubtful cases, I have entered the auction houses' websites and www.artinfo.pl[157] to check (based on the photo, provenance, etc.) whether two transactions refer to the same object. However, since only one auction house (DA Agra-Art) has a publicly accessible database containing all the auction records, whereas all the remaining ones do not collect or publish auction results on a systematic basis, it was sometimes hard to verify the ambiguous pairs of sales. Finally, in the case of the objects hammered down at the no-longer-existing auction houses, this task was even impossible. Therefore, I was forced to exclude 50 dubious double sales from the sample. It might be, however, that some of them should have been included, whereas some other 'matching' records should have been left out. On the whole, it is possible that both biases offset one another and that the omission of some transaction pairs has no significantly negative effect on the obtained results.

With regard to the measurement method, even though I introduce a refined version of the double-sales approach, which allows for more precise calculations, there still remains the problem of high sensitivity of the obtained results to the length of the holding interval. Therefore, it is possible that the rate of return could be slightly different, if the holding period were expressed with the use of the number of days, rather than months.

Another serious limitation results from the fact that the existence of the hammer price does not imply that the work was actually sold, or that it was purchased for the sale price equal the hammer price plus buyer's premium and applicable VAT. It is because the reserve price set by the seller might not have been reached, which would not be recorded in the data. However, as already mentioned in chapter 6, as a result of subsequent negotiations between the buyer and seller, in some cases the work might have been bought for a price below the hammer price. A further obstacle to obtaining reliable outcomes is caused by the potential fictitious character of some auctions. However, I am not able to verify the extent of this practice or measure its impact on the returns. Finally, my estimates may be biased, and most

[156] This is because some auction houses publish erroneous information in the pre-auction catalogues, but also because some titles differ across subsequent auctions (e.g. if a work was not given a specific title by the author).

[157] This is the second database that systematically compiles all the auction records in Poland. However, the data dates back only to 2000. Therefore, I was able to use www.artinfo.pl to verify only those works that appeared on the market between 2000 and 2004.

probably upwards, because I do not account for any costs, but also tax benefits and other potential sources of revenue (e.g. from art rental) involved in purchasing, holding and selling an artwork. However, this is a consciously made choice – since most of the literature on art investment disregards those issues, this allows me to compare my results with the outcomes of other papers studying similar periods.

Finally, since Bołdok (1998, 2001, 2005) does not include data on the first few auctions that took place in 1989 and disregards auctions held within the last three years, the calculated rate of return is not representative for the entire period since the beginning of the auction market in Poland.

The major strength of my study is that it attempts to account for transactions realized on the whole Polish auction market[158]. In contrast to most previous papers, which usually calculate the returns on works sold at Christie's and Sotheby's, I rely on the results of most auctions that have ever been held in Poland[159], which reduces the sample selection bias and leads to more general, representative and reliable outcomes.

7.7. Future research

The next step to be taken is to construct an art price index for the Polish auction market, which would systematically track art price movements and thus serve the market participants as a valuable source of information. However, it first requires developing a comprehensive database that would contain all the auction results from the onset of the Polish auction market[160].

In my study, I try to account for the monetary performance of art purchased at auctions in Poland. Since I might have failed to detect some double sales and thus introduce a bias in my calculations, it would be interesting to verify my findings with the use of an alternative measurement method, such as repeat-sales or hedonic regression. It would be also useful to update my results and extend the period under study by the additional 3 last years, as well as include the omitted observations from 1989.

In addition, more research on the returns on particular art categories should be carried out. In my study, I analyze only the masterpiece, contemporary and foreign art segment.

[158] Of course in so far as it is possible with the use of the double-sales approach.

[159] At least those that took place at an auction house or in a gallery. Although I do not account for the occasionally held charitable auctions, it could be argued that they may be somehow unrepresentative for the whole auction market, i.a. due to the high share of contemporary works auctioned.

[160] This is especially of a concern for the years 1990-2000, since after this period auction results have been systematically collected and published on www.artinfo.pl.

However, it is possible that higher gains could be reaped by investing in other, more unappreciated and undervalued art categories, such as artworks created before the 19th century, Polish works from the mid-war period, or the 1960s, 1970s and 1980s.

Finally, it would be interesting to examine the relationship between the art and other markets, especially the stock market. I believe that there is a correlation between the returns on art and other asset classes, although it may be lower than on the more mature markets. It is because demand for art in Poland is still fairly limited, even though a growing interest in art as an alternative form of investment could be observed within the last few years. If this is really the case, adding art to a diversified portfolio may be a source of substantial benefits.

8. Conclusion

What picture of art as an alternative form of investment emerges from my thesis? In general, art seems to underperform other asset classes, which makes it a rather poor investment vehicle. Although most studies underline that art retains real value in the long run, some authors observe that the studied artworks have actually depreciated in value in real terms over certain periods of time. No matter whether as a result of some behavioral factors or unfavorable shifts in tastes and fashions, this shows that investing in art is a risky undertaking. Preferences change, new trends set in and art history verifies the 'stars' of today. Potential theft, damage, fire, forgery, or misattribution all further add to the risk of holding an artwork for purely financial gains.

Does it mean that an individual wishing to allocate her financial means in a painting should abandon the idea and choose a more lucrative form of investment? Not necessarily. The art market seems to offer some avenues for benefiting from owning an artifact. One of the few issues most authors agree on are the potential advantages of adding art to a diversified portfolio. Even though, due to the high risk and fairly low rate of return, artworks might appear to be ill-suited for this purpose, it seems that investors may actually benefit from making such a move. Moreover, potential gains could be further enhanced by constructing an optimal art portfolio, diversified across different art categories. This should be of interest not only to the individuals considering investing in a collection of artworks, but primarily to art funds and other enterprises interested in the art market as a source of financial gains.

However, the crucial question for those wishing to hold an artwork in hope of its monetary appreciation is whether it is really possible to predict art price movements and thus beat the market. This still remains a puzzle. The 'nobody knows' seems to be inherent to the art world. The hype of today may turn into future obsolescence. However, the history shows that some artworks, artists, movements, or artistic schools systematically appreciated over time. Those lucky enough to have purchased a Picasso, van Gogh or Pollock at the beginning of artists' careers, have reaped extraordinary gains. As the example of the Ganz collection suggests, connoisseurship and experience may give an investor a competitive edge over other market participants and enhance the returns. On the other hand, the experience of some failed art funds might indicate that even expert knowledge and extensive net may not guarantee a successful investment. Therefore, it would be highly interesting to research whether art dealers, a group of market participants that possesses superior knowledge, are able to systematically beat the market.

Another important issue is whether there are any 'fundamentals' that might guide investor's choice. There is some evidence on a close relationship between the art and financial markets. The obstacle to reaching any final conclusions on this matter is that the only available information comes from the auction market and refers mostly to its higher end. Therefore, although part of the gains realized on financial markets might be spent on artworks and contribute to an increase in art prices on the international level, it does not mean that a similar pattern applies to each national market. However, simple logic would suggest that a general increase in buyers' wealth should positively affect the demand for art and thus enhance art prices. If this relationship holds for the art market in general, stock indices might be considered leading indicators signaling the upcoming boom or downturn on the art market. It would also enable investors to forecast art price movements and, therewith, reap above-average gains.

Less clear is whether some individuals may be in the position to create new fashions and trends, and thus benefit from the growing demand. The spectacular commercial success of Young British Artists promoted by Charles Saatchi might indicate that some members of the art world may, in fact, be able to exert such influence and, as a consequence, enhance the returns.

The problem with reaching any general conclusions on each of the issues related to art investment emerges from the widespread use of data on transactions performed at the major international auction houses, which represents only a part of the global art market. As a result of disregarding the objects sold on the primary and secondary market, as well as private deals, the outcomes of various studies may be significantly biased. Therefore, since many potential buyers do not dispose of ample financial means, the conclusions drawn by the researchers might be of interest only to the high-net-worth individuals and companies active in the art investment sector.

In this thesis, I have presented the findings on art investment, financial performance of art and several related aspects. Since evidence on some crucial issues is mixed, many questions remain open to debate. The art market clearly differs from other markets, one of its major characteristic features being inefficiency. This implies that the persistent art market-specific anomalies could allow a potential investor to reap extraordinary gains. In order to check the robustness of this argument, I have carried out an empirical study on the works auctioned on the relatively young Polish auction market in the period 1990-2004. The underlying assumption was that the maturity of the market is negatively correlated with the magnitude of the anomalies. Therefore, the anomalous nature of the immature Polish auction

market may be a source of the above-average returns to the potential buyers. Although the evidence is mixed, some of my findings suggest that, in some instances, similarly to the emerging economies, investing on a less developed auction market may result in substantial gains. There is, however, a clear need for further research on this issue. With the rapid development of China, India and Russia, and the resulting maturation of their art markets, this aspect may be of particular relevance, especially in the nearest future.

It could be argued that investing in art could be perceived as placing bets on the future preferences of the art market participants, which would imply that luck plays the major role. This argument, when coupled with the long list of limitations and obstacles to studying art investment, may undermine the validity of any conclusions drawn on the art-investment-related issues. However, although there is still much room for improvement and further research, I strongly believe that there is a point to analyzing artworks from the investment perspective. And even though researchers may not be able to fully account for the financial performance of art or forecast future art price movements, their findings may still be of great significance for those willing to invest in works of art.

9. References

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10. Appendices

10.A. Findings of particular studies

10.A.1. Introduction

This part gives a detailed overview of the findings of the major studies on art investment and returns on art. It is intended as a supplement and extension of chapter 2, and is supposed to give a better insight into financial performance of art, relative to other forms of investment. In the first section, I analyze the general outcomes obtained by authors studying the fine art market. The second part presents the results of papers focused on regional and national sub-markets. Finally, I discuss the findings of studies devoted to other sub-markets.

10.A.2. Fine art market

Most researchers consider the studies of Anderson (1974) and Stein (1977) the seminal literature on art investment. However, it should be noted that the first to focus on art price movements and rates of return on art was actually **Wagenführ** (1965), whose paper has not received enough recognition, probably because it was written in German (Frey and Eichenberger, 2003). Some authors (e.g. Stein, 1977) refer also to works of **Rush** (1961) and **Keen** (1971), but, similarly to Wagenführ, their results are rarely quoted. Besides the above mentioned literature, **Reitlinger**'s (1961, 1963, 1970) three-volume 'The Economics of Taste' is considered a milestone for carrying out systematic studies on art investment. This comprehensive record of hammer prices fetched by different types of collectibles that encompasses data from over three centuries became a valuable information source for many researchers (for more details on Reitlinger data see chapter 2 Literature review, section 2.3.2.Reitlinger data). But it was in fact Baumol's (1986) work, whose publication coincided with the beginning of the greatest art boom in the history that sparked growing interest in art investment among academics. In the subsequent sections, I present the general findings of particular studies.

Based on data drawn from Reitlinger (1961, 1970) and *Mayer International Auction Records* (1971), **Anderson** (1974) constructs a hedonic price index and, for the period 1780-1970, calculates the annual nominal rate of return to amount to 3.3%. In addition, by applying repeat-sales regression, he estimates that between 1653 and 1970 a sample of 1,730 paintings

appreciates at the annual nominal rate of 4.9%, whereas in the somehow shorter period 1780-1970, it yields 3.7% per annum in nominal terms. For the latter period, the author also calculates the rates of return for 4 sub-markets (Old Master, English 18th and 19th century, Impressionist and 20th century art) at five year intervals. By disaggregating the data, he is able to show substantial fluctuations in the rates of return across different artistic schools and time periods. Anderson observes that works from particular schools (Impressionist and 20th century paintings), as well as time periods (1950s and 1960s) yield returns far above the long-run average and similar to those offered by common stocks. However, in the long run, returns on art appear to be only half of those on common stocks. Therefore, when accounting for the risk involved and low liquidity of art, paintings do not seem to be an attractive investment, unless the consumption value of art is taken into account.

With the use of *Art Prices Current* auction data, for the years 1946-1968, **Stein** (1977) constructs a geometric mean price index. In order to isolate a fixed, underlying set of observations, from which paintings are randomly chosen, he narrows the sample to works created by artists who died before 1946. He estimates the annual nominal rate of return to amount to 10.47% (for U.S. paintings), 10.38% (for dollar-denominated prices of U.K. paintings) and 13.12% (for pound-denominated prices of U.K. paintings). As compared to major financial assets, art does not yield above-average returns (the annual return on art equals only 73% of the return on equities, including capital gains), especially considering the substantial non-systematic risk involved. Therefore, Stein's conclusion is that art should not be considered a lucrative investment. It can, however, outperform other alternative assets if one accounts for the benefits derived from 'viewing services', which the author approximates at 1.6% annually.

Baumol (1986) also relies on Reitlinger data. From the complete list of multiple sales that occurred at an interval no shorter than 20 years, he isolates 640 transaction pairs for the period 1652-1961. By applying the standard continuous compounding formula, he then calculates the annual real rate of return to equal 0.55%. When considering the substantial risk involved in holding a painting, as well as transaction and other costs (e.g. maintenance, insurance costs, etc.), this figure should be further adjusted downwards. In comparison to the real rate of return on British government securities, which, for the whole period, Baumol estimates to be roughly around 2.5% on average, investment in art generates an opportunity loss of around 2 percentage points per annum. Moreover, over 40% of the sampled paintings yield a negative return and around 60% incur an opportunity loss. The final conclusion drawn by Baumol is that art prices behave randomly, which means that there may be no price

equilibrium level. And while it is possible that extraordinary gains (but also losses) could be made within a short holding period (defined by the author as less than 50 years), in the long run, the average returns approximate zero. Similarly to Anderson (1974) and Stein (1977), Baumol argues that high returns on art are possible only when accounting for the aesthetic pleasure derived by the owner.

In their two studies, **Frey and Pommerehne** (1988, 1989a) try to overcome some serious limitations of previous works. With the use of Reitlinger data, for a sample of 305 artists whose works were sold at least twice, they track the subsequent transactions performed at both European and U.S. auction houses. The authors also extend the period under study to 1987. This leaves them with a sample of 1,937 double sales. Similarly to Baumol (1986), they apply the double-sales approach to calculate the annual real rate of return, but only for those cases, in which the holding period exceeds 20 years. They do, however, account for transaction costs (i.e. buyer's premium and seller's commission), which they approximate at 0.4% annually. For the overall period 1635-1987, Frey and Pommerehne estimate the average annual real rate of return to amount to 1.5%. This figure seems rather low, especially when considering that the real rate of return on best credits equals 3%. It should be also noted that in 30% of the cases, paintings yield a negative return. For the sub-periods 1635-1949 and 1950-1987, artworks appreciate at the annual real rate of 1.4% (as compared to 3.3% for government securities) and 1.6% (as compared to 2.4% for government securities), respectively. This slight difference in returns between both periods can be attributed to a substantial growth in inflation rate after 1950, rather than better financial performance of art[161]. In line with Baumol's findings, large gains (but also losses) may be realized only in the short term (defined as 20-39 years)[162] and the longer the investment horizon, the smaller the range of returns (approximately 2% annually in the long run). However, contrary to Baumol's results, the authors do not find evidence for the random behavior of art prices for the earlier period, and claim that, under certain circumstances, superior knowledge could allow an investor to predict art price movements and thus enhance the returns. Nevertheless, they admit that changes in tastes and fashions may undermine the predictability of art prices. The final conclusion drawn by Frey and Pommerehne is that art, especially when considering the high

[161] The relative greater attractiveness of art investment in the post-war period is further enhanced by the fact that the rapid growth of inflation rate is not accompanied by a corresponding increase in the nominal interest rates on the long-term credits (Frey and Pommerehne, 1989b).

[162] According to the authors, larger gains and losses are associated with higher volatility. In the long run, however, higher risk of art investment, relative to financial assets, is not compensated by greater returns.

risk involved, does not seem to be a lucrative investment, unless consumption benefits resulting from owning an artwork are considered.

Goetzmann (1993) combines Reitlinger data with information taken from *Mayer International Auction Records* (various years: 1971-1987). Using repeat-sales regression, he constructs an art price index for a sample of 2,809 paintings sold at least twice within the period 1715-1986. Based on his calculations, the author identifies long-term price trends on the art market, with three bull markets (1780-1820, 1840-1870 and the strongest 1940-1986) and three bear markets (1830-1840, 1880-1900 and 1930-1940) in the period under study. Moreover, he estimates the annual nominal rate of return to amount to 3.2% for the entire period, which is fairly higher than the rate of return on British stocks (1.5%), but still lower than the one on British consol bonds (4.3%). However, for the shorter periods 1850-1986 and 1900-1986, a somehow different picture emerges. At first, with the annual nominal rate of return of 6.2% (as compared to 2.6% for stocks and 4.1% for bonds) and 17.5% (as compared to 4.9% for stocks and 4.7% for bonds), art appears to outperform both British equities and consol bonds. Nevertheless, the author concludes that when accounting for dividend yields (estimated at 3-5% annually) and high volatility of art prices, art could be considered an attractive investment only by the nearly risk-neutral investors.

Buelens and Ginsburgh (1993) revisit Baumol's (1986) findings and introduce a somehow different approach. First, based on the data set used by Baumol, they recalculate the annual real rate of return and arrive at 0.87% (as compared to 0.55% estimated by Baumol)[163] for the sample of paintings resold after more than 20 years and 0.65% for the whole sample. Next, they subdivide the data into 4 national schools (British, 17th century Dutch, 15th, 16th and 17th century Italian and French Impressionist paintings) and 4 time periods (1700-1869, 1870-1913, 1914-1950 and 1951-1961). Based on their findings, the authors argue that the low rate of return obtained by Baumol can be largely attributed to the aggregated nature of the underlying sample. Buelens and Ginsburgh observe that the rates of return vary strongly across different sub-markets and sub-periods, but, with the exception of the years 1914-1950 (times of war and great turmoil) and overrepresented school of English paintings, which account for almost 50% of the sample, they are generally positive. When disregarding the period 1914-1950, as well as Italian and English artworks, art appears to significantly

[163] The authors attribute this discrepancy to a different treatment of inconsistent information on sales recorded in Reitlinger than in Baumol's study. As a consequence, they obtain 723 transaction pairs with a holding period of over 20 years, whereas Baumol detects only 640 such double sales.

outperform bonds, which, on average, yield 2.5% annually, as estimated by Baumol[164]. Moreover, similarly to Anderson (1974), the authors argue that some schools (Impressionist artworks) and periods (1950-1961) yield above-average returns, which are not necessarily accompanied by higher risk. Therefore, they conclude that, in some cases, art might be considered an attractive investment. And even though, in general, prices may behave in a random manner as a result of changing tastes, it takes long before those shifts actually set – a view that questions Baumol's argument of unpredictability of art prices. Finally, in order to overcome the limitations of Baumol's calculations and verify his results, Buelens and Ginsburgh construct also a hedonic price index. This time, for the whole period the estimated annual nominal rate of return amounts to 0.91%. Although the authors use a much larger sample, their results are comparable to those obtained by Baumol. However, it should be noted that in many cases there are big discrepancies between particular rates of return calculated with the use of hedonic and repeat-sales regression (especially for the period 1950-1961 and Impressionist paintings). This reveals one of the major limitations of art investment literature, namely estimates' high sensitivity to the choice of the measurement method.

Pesando (1993) studies the market for modern prints, whose nature makes it well-suited for applying repeat-sales regression[165]. Based on the data drawn form *Gordon's Print Price Annual* (1978-1992), for the period 1977-1992, he identifies 27,961 repeat sales of modern prints created by 28 artists and constructs an aggregate price index, as well as a price index for a sub-sample of Picasso prints. For the whole sample and Picasso portfolio, he estimates the annual real rate of return to amount to 1.51% and 2.10%, respectively. This is less than returns yielded by financial assets, such as U.S. 180-day Treasury bills (2.23%), long-term bonds (2.54%) and stocks (8.14%). At the same time, the risk involved in investing in modern prints is comparable to the volatility of equities and long-term bonds. The author also examines the existence and direction of the 'masterpiece effect'. For the sample of masterpieces defined as top 10% works ordered by sale price, he identifies a negative 'masterpiece effect', i.e. inferior performance of modern prints, relative to alternative forms

[164] However, it should be noted that since the authors rely on the figure calculated by Baumol and not their own estimates, no final conclusions on the overall performance of art, relative to alternative forms of investment, can be drawn.

[165] Since prints are multiples, often published in large editions of 50-100 or more, assuming there are no differences in quality, transactions involving different impressions of the same print can be treated as multiple sales of the same object. This has important implications for the studies applying repeat-sales regression, since it allows for a construction of a substantially bigger sample of transaction pairs, and thus enhances the accuracy and reliability of the obtained results.

of investment[166] (for more details see chapter 5 Return factors, section 5.2.4.2.'Masterpiece effect').

By extending the period under study to 1996 and narrowing their focus only to Picasso prints, **Pesando and Shum** (1999) reapproach Pesando's (1993) paper. Their findings confirm Pesando's results. The authors estimate that the annual real rate of return on the portfolio of Picasso prints (1.48%) is lower than the one on financial assets (i.e. stocks with 9.13%, long-term U.S. government bonds with 3.45% and 180-day Treasury bills with 2.29%). When accounting for high risk, whose degree is comparable to the volatility of stocks and long-term government bonds, and which exceeds that of U.S. Treasury bills, art underperforms alternative forms of investment.

In their recent paper, **Pesando and Shum** (2008) once again reexamine Pesando's (1993) findings and further extend the period under study to 2004. Surprisingly, for a much longer period, they obtain the exactly same annual real rate of return on the aggregated portfolio of modern prints (1.51%). For Picasso portfolio, the annual real rate of return amounts to 3.02% (whereas the rate of return calculated by Pesando is lower and equals 2.10%) – a superior performance, as compared to Miró and Chagall individual print portfolios. Although art underperforms financial assets (8.55% for U.S. stocks, 4.98% for U.S. government bonds and 1.93% for 180-day Treasury bills), it yields returns higher than those on gold (-0.13%). This time, however, modern prints seem to be far less risky than common stocks, but still more volatile than 180-day Treasury bills. The authors also test Pesando's previous findings on the underperformance of masterpieces. Surprisingly, their results provide mixed evidence. Whereas top 5% of prints ordered by price yield above-average rates of return, returns on top 10% and 20% most expensive works are below average.

Based on data drawn from *Mayer International Auction Records* (1963-1991), for 2 sub-samples of paintings created by European artists born after 1830, **de la Barre et al.** (1994) construct hedonic indices. For the period 1962-1991, the authors obtain a sample of 24,540 sales of artworks executed by 82 well-known Impressionist, modern and contemporary painters[167] (referred to as 'Great Masters') and 6,410 sales of works of 82 randomly chosen artists (referred to as 'Other Painters'). The authors estimate that, over the whole period, 'Great Masters' appreciate at the annual nominal rate of approximately 12%, which is fairly higher than the returns on stocks, whereas the financial performance of 'Other Masters'

[166] Pesando identifies the same effect when masterpieces are defined as top 20% of the sample ordered by price.
[167] The criteria used by the authors include: the artist lived or spent a large part of her life in Paris, is well-known and/or her works are often sold at auctions.

(around 6%) is comparable to that of equities[168]. However, as those numbers do not account for transaction costs, risk and illiquidity of artworks, they should be further adjusted downwards. Moreover, for the 'Great Masters' sample[169], the authors identify a positive 'masterpiece effect'. They also question Baumol's argument on the random behavior of prices (at least with regard to the works of well-known artists) and suggest that art prices could be predicted. Finally, de la Barre et al. underline the importance of psychic returns and their decisive impact on the magnitude of returns on art investment.

From a sample of 80 artists born after 1830, who spent at least part of their life in Paris and whose works are recorded in *Mayer International Auction Records* (1963-1988), **Gérard-Varet** (1995) selects only those, whose works are also included in Reitlinger database. With the use of hedonic regression, he estimates the following annual real rates of return for different sub-periods: 6.2% (1855-1914), -2.0% (1915-1949)[170], 22.6% (1950-1960)[171], 6.8% (1961-1988) and 13.3% (1976-1988). Similarly to Buelens and Ginsburgh, he points to substantial fluctuations in the rates of return over time. The author also observes that, in the long run, returns on art outperform inflation and that during some periods (e.g. 1950-1960) artworks appreciate at a rate comparable to that of stocks. He thus confirms the findings of Buelens and Ginsburgh, and shows that, despite the low long-term rate of return, in some cases, art may be considered a superior investment alternative, relative to traditional financial assets. He also compares the risk involved in investing in art and stocks, and, contrary to previous findings, concludes that prices of equities are much more volatile. Finally, in line with other studies, the author estimates consumption benefits to be positive, but not substantially different from zero.

Chanel et al. (1996) analyze returns on artworks created by 46 artists born after 1830, who spent at least part of their life in Paris and whose works are recorded in Reitlinger. For the period 1855-1969, this leaves them with a sample of some 1,900 sales. With the use of hedonic regression, they estimate the annual real rate of return to amount to 4.9% for the whole period. For 5 sub-periods, the authors calculate the following annual real rates of return: 6.9% (1855-1914), -3.1% (1915-1949), 22.4% (1950-1960), 4.3% (1961-1969) and 13.8% (1950-1969). The results thus confirm the findings of Buelens and Ginsburgh, and

[168] However, it should be noted that the authors do not name the exact rate of return on stocks.
[169] I.e. masterpiece sample defined as frequently traded works and/or works created by well-known artists.
[170] This seems to confirm the findings of Buelens and Ginsburgh, who, for the period 1914-1950, estimate the returns on art to be negative.
[171] This figure (given in real terms) also corresponds with the findings of Buelens and Ginsburgh – for the period 1950-1961 they estimate (with the use of repeat-sales regression) the annual nominal rate of return to amount to 20.3%.

Gérard-Varet. The rates of appreciation vary across time periods, and seem to be extraordinarily high in the 1950s and 1960s, even relative to returns on stocks. Chanel et al. also compare the results obtained with the use of hedonic regression (4.9%), with the rates of return calculated using repeat-sales and geometric repeat-sales (double-sales) approach (5.9% and 5.0%, respectively), and thus point to estimates' high sensitivity to the choice of the measurement method.

Based on the Sotheby's Art Index, for a sample of 61 representative 19th century European artists, **Fase** (1996) designs a composite (basket) price index. For the periods 1972-1992 and 1982-1992, the estimated annual nominal rates of return amount to 10.6% and 8.6%[172], respectively. This is generally less than the returns on alternative forms of investment (i.e. 11.2% and 16% for U.K bonds, 14.8% and 19.2% for stocks, 12.9% and 0.5% for gold, 11.8% and 8.2% for real estate). However, in the period 1946-1966, paintings appreciate at a considerably higher nominal rate of 11.0%, relative to stocks (6.7%) and gold (1.8%). Fase attributes those differences in the rates of return to the existence of psychic returns enjoyed by the owners of artworks and/or lower risk of investing in art [173].

In their paper, **Mei and Moses** (2002a) construct a completely new data set that records repeat-sales of paintings, which enables them to base their calculations on a higher number of observations (4,896 repeat sales), relative to previous studies. They design a general art price index, as well as 4 disaggregate indices (American, Old Master, Impressionist and modern paintings). For the period 1875-1999, the authors estimate that art yields an annual real rate of return of 4.9%, which is more than the return on securities (2.0% for U.S. government bonds, 2.9% for corporate bonds and 1.9% for Treasury bills), but less than the one on equities (6.6% for S&P500, 7.4% for Dow Jones). However, in the latter half of the century, paintings appreciate at the annual real rate of 8.2%, which is comparable to that offered by stocks (8.9% for S&P500 and 9.1% for Dow Jones), and much higher than in the case of bonds (1.9% for government and 2.2% for corporate bonds) or Treasury bills (1.8%). With art yielding higher returns than fixed-income securities over the whole period, this outcome seems to contradict most previous findings, according to which, in the long run, art underperforms alternative forms of investment. Furthermore, by calculating returns on artworks for the period 1900-1999, the authors are able to compare their results with those obtained by Goetzmann. While in his study, returns on art are higher than those on stocks and

[172] This translates into 1.1% and 2.9% in real terms.

[173] However, author's concluding remark (ibid., p.657) '[…] we may conclude from the fact that, on the basis of results presented in the literature, returns on art fluctuate heavily. Hence the investment risk of art is large' seems to fully contradict his earlier statement that art investment might involve lower risk.

bonds, according to Mei and Moses, artworks outperform only bonds[174]. Moreover, their index shows less volatility than stock indices (although still more than in the case of other forms of investment). For the most expensive works, the authors also identify a negative 'masterpiece effect' across all sub-samples. On the whole, they conclude (ibid., p.1666) that 'contrary to some earlier studies […] art has been a more glamorous investment than some fixed-income securities, though it underperforms stocks'. Therefore, assuming transaction costs could be spread over a long period of time, artworks might be considered an attractive investment.

10.A.3. Regional and national sub-markets

Apart from the above mentioned studies on financial performance of fine art, there is also abundant literature devoted to some particular, usually regional and national, sub-markets. In this section, I shortly present their findings.

Mok, Ko, Woo and Kwok (1993) investigate the market for modern Chinese paintings created after 1911, and auctioned at Christie's or Sotheby's in the period 1980-1990. For a small sample of 20 artworks sold at least twice within the given period, they estimate the annual nominal rate of return to amount to 52.9%[175]. At first, art seems to perform relatively well, relative to financial assets (13.3% for Hong Kong stocks, 15.3% for Singapore stocks and 154.4% for Taiwanese stocks). However, when accounting for risk involved, modern Chinese art underperforms alternative forms of investment. Moreover, contrary to some previous findings, the authors argue that a longer holding interval is associated with higher returns and estimate that paintings resold within 2 years yield a negative rate of return (-7.6%)[176]. On the whole, they conclude that, even though returns on art might be relatively high, the risk and costs involved, as well as art's low liquidity, make modern Chinese art a rather inferior investment.

Agnello and Pierce (1996) use hedonic regression to study returns on artworks auctioned in the period 1971-1992 and created by 66 American most expensive and/or most

[174] For the period 1900-1999, Mei and Moses calculate the following rates of return on financial assets: 6.7% for S&P500, 7.4% for Dow Jones, 1.4% for U.S. government bonds, 2.0% for corporate bonds and 1.1% for Treasury bills. One of the possible explanations for the discrepancies in the results obtained by Mei and Moses, and Goetzmann could be the reliance on different datasets.

[175] In their calculations, the authors account for transaction costs.

[176] However, it should be noted that those results may be biased due to a very small underlying sample, as well as the choice of the period under study. Since the latter part of the 1980s was a time of great boom on the art market, it is not surprising that returns on artworks sold between 1980 and 1990 are positively correlated with the length of the holding interval.

frequently traded artists born before the Second World War. The data is drawn from the *Annual Art Sales Index* (Hislop, 1971-1992). For the whole sample, the authors estimate the annual nominal rate of return to amount to 9.3% (3.25% in real terms), which is less than the returns on stocks (13.1%, accounting for dividends), but comparable to those on long-term U.S. government bonds (9.7%) and Treasury bills (7.4%). However, the calculated rate of return should be further adjusted for risk. Agnello and Pierce also subdivide the whole period under study, and calculate the annual nominal rates of return to equal 6.3% (1971-1979) and 14.3% (1980-1992), respectively. The latter result suggests that art might be considered a lucrative investment. Moreover, the authors run hedonic regression for more homogenous sub-groups, and observe that certain subject matters and styles yield above-average returns, which is also in line with the earlier findings of Buelens and Ginsburgh. Finally, for the sample of masterpieces ordered by price, Agnello and Pierce identify a positive 'masterpiece effect'.

In his paper, **Agnello** (2002) reexamines the earlier findings of Agnello and Pierce. He thus extends the period under study to 1996 and increases the sample of artists to 91. This time, a far darker picture emerges. For the whole period, the estimated annual real rate of return is negative and equals -1.2% (4.2% in nominal terms). Therewith, art performs way worse than financial assets (6.2% (11.6% in nominal terms) for S&P500, 3.1% (8.5% in nominal terms) for U.S. long-term government bonds and 1.7% (7.1% in nominal terms) for Treasury bills). However, after disaggregating the data into different sub-samples (high- and low-end paintings, as well as different subject matters), the author observes that the most expensive artworks yield above-average returns (i.e. a positive 'masterpiece effect'), which is also in line with Agnello and Pierce's earlier findings. Moreover, higher returns on those works are not accompanied by a significant increase in volatility. However, Agnello concludes that, in general, investing in art involves greater risk, relative to alternative assets. In addition, he detects a substantially higher degree of risk associated with investing in particular subject matters.

For a sample of modern and contemporary paintings sold at the Italian auction house Casa d'aste Finarte in the period 1983-1994, **Candela and Scorcu** (1997) construct an art price index. Based on both pre-sale price estimates and auction data, the authors develop and apply a new method of measurement – 'representative painting' approach. As a result, they obtain a semi-annual nominal rate of return of 1.92%, which is lower than the one on Italian

government bonds and stocks[177]. They explain this difference in returns by the existence of an aesthetic dividend and ownership effect[178]. The authors conclude that, in the long run, art prices increase in line with inflation.

Based on a sample of 10,598 sales of artworks created by 71 most representative Belgian painters in the period 1850-1950, and auctioned between 1970 and 1997, **Renneboog and Van Houtte** (2002) construct art price indices. With the use of geometric mean, the authors calculate the average annual nominal return to amount to 7.6% for a portfolio of all paintings and 9.8% for a portfolio of oil paintings. Returns on paintings in general are thus somehow lower than those on stocks (8.7% for world stocks, 8.3% for S&P500, 9.2% for European stocks and 8.8% for Belgian stocks), whereas oil paintings perform slightly better than equities. For a shorter period 1970-1989, the estimated returns on both samples equal 13.7% and 16.8%, respectively. This suggests superior performance of art, relative to equities (9.9% for world stocks, 7.3% for S&P500, 9.8% for European stocks and 8.9% for Belgian stocks). After disaggregating the data, the authors observe that the rates of return vary substantially across media and artistic movements, and that Realist, Luminist and Surrealist paintings outperform stocks over the entire period. With the use of hedonic regression, Renneboog and Van Houtte estimate the annual nominal rate of return to amount to 5.6% for the entire sample and 7.6% for oil paintings. This time, artworks in general, as well as individual artistic movements, seem to underperform shares. Moreover, when considering particular art categories, only Expressionist and Luminist artworks yield positive real rates of return over the whole period under study. The authors thus conclude that relatively low returns accompanied by high risk, as well as illiquidity and substantial costs involved in investing in Belgian art, make it a rather unattractive investment, especially relative to stocks. However, they argue that consumption benefits might compensate the investor for the inferior financial performance of Belgian artworks.

Edwards (2004) analyzes the returns on works created by 115 Latin American artists from 17 countries, and auctioned between 1981 and 2000. With the use of hedonic regression, he constructs an index for the whole sample, as well as 12 art price indices for particular national art portfolios and an index for all the other Latin American artworks included in the sample. For the whole period, the annual real rate of return on Latin American art amounts to 9.0%, which is more than the returns offered by some emerging stock markets (3.8% for

[177] Unfortunately, the authors do not name any precise figure.
[178] This is an additional gain resulting from owning, and not merely possessing an artwork (Frey and Eichenberger, 1995a).

Argentina, 7.3% for Brazil, 7.3% for Chile, 5.5% for Mexico). The author also observes a positive correlation between the returns and degree of risk, and argues that particular national art portfolios are more volatile than the Latin American art portfolio. Surprisingly, when disaggregating the data into various sub-samples, the author estimates that the rate of return on a portfolio of works created by female artists (32.04%) substantially exceeds the return on the whole sample (9.0%).

For a sample of 12,821 sales of works executed by 152 major Canadian painters and auctioned in the period 1968-2001, **Hodgson and Vorkink** (2004) construct a hedonic price index. They thus calculate the annual nominal rate of return on Canadian art to amount to 7.6% (2.3% in real terms), as compared to 14.2% (9.0% in real terms) for Canadian stocks and 8.2% (3.0% in real terms) for bonds. Those results suggest that Canadian art underperforms financial assets and thus should not be considered an attractive investment.

Based on a sample of 37,605 paintings created by 60 renowned Australian artists, and auctioned between 1973 and 2003, **Higgs and Worthington** (2005) construct a hedonic price index. They estimate the annual nominal rate of return on Australian art to equal 6.96% (0.40% in real terms). They thus conclude that Australian art does not seem to be a lucrative investment.

In a more recent paper, **Worthington and Higgs** (2006) reduce the previously studied sample to 30,227 paintings executed by 50 well-known Australian artists and hammered down in the period 1973-2003. This time, they obtain an annual nominal rate of return of 4.82%, which is lower than that on Australian stocks (7.0%). Moreover, the volatility of art is comparable to the risk involved in investing in equities. Similarly to the earlier findings, this implies that Australian art is a rather inferior investment, as compared to stocks.

Finally, **Kräussl and van Elsland** (2008) apply a novel two-stage hedonic method to a sample of 61,135 paintings created by 5,115 German artists and auctioned in the period 1985-2007. They construct two art price indices – for the whole sample and top 100 German artists (ordered by the number of transacted works). They calculate the annual nominal rate of return to equal 3.8% (for dollar-denominated prices) and 1.3% (for euro-denominated prices), which is only slightly more than the returns on 3-month Treasury bills (3.0%) and significantly less than in the case of other forms of investment (10.12% for hedge funds, 9.36% for real estate, 8.52% for corporate bonds, 8.42% for equities, 8.34% for government bonds, 7.88% for commodities and 7.4% for private equity). Moreover, art's volatility seems pretty high and the risk-return ratio much lower, relative to alternative asset classes.

Therefore, German art appears to be an inferior investment, unless used as a protection against downside risk, or, in some cases, for the means of portfolio diversification.

10.A.4. Other sub-markets

There are several studies that narrow their focus to a particular area of interest, such as a part of artist's oeuvre (e.g. the already mentioned work of Pesando and Shum (1999) devoted to Picasso prints auctioned in the period 1977-1996, or **Czujack**'s (1997) paper on Picasso paintings hammered down between 1963 and 1994), artistic movement or school (a study of **Ginsburgh and Penders** (1997) who focus on the market for Land Art), or a collection. With regard to the latter aspect, particularly interesting are the results obtained by **Landes** (2000), who analyzes the returns on Victor and Sally Ganz collection of the 20th century artworks auctioned in 1986, 1988 and 1997. With the use of the standard continuous compounding formula, for the holding period of over 50 years, he calculates the following annual real rates of return:

- 21.49% (until 1986), 14.73% (until 1988) and 12.06% (until 1997) – total returns
- 20.67% (until 1986), 14.29% (until 1988) and 11.74% (until 1997)[179] – net returns

which substantially exceed the returns yielded by some alternative asset classes:

- 3.66% (until 1986), 5.39% (until 1988) and 7.81% (until 1997) for large company stocks[180]
- 7.68% (until 1986), 10.11% (until 1988) and 10.85% (until 1997) for small company stocks

Those results seem to contradict previous findings on the inferior financial performance of art in the long run, especially since artworks from the Ganz collection seem to outperform stocks irrespective of the period, artist, or type of work.

[179] However, the author admits that, since he does not account for taxes, or the potential special sale conditions negotiated by the owners with Christie's, those figures could be biased. However, it should be noted that, in his calculations, Landes takes into account transaction costs.

[180] Those figures account for reinvestment of capital gains and dividends.

10.B. Returns on art and alternative assets

Authors	Sample	Period	Method (index)	Annual nominal rate of return on art	Annual real rate of return on art	Annual rate of return on alternative assets[2]
Anderson (1974)	Paintings in general	1780-1970 1780-1970 1653-1970	Hedonic Repeat sales Repeat sales	3.3% 3.7% 4.9%		~6.6%
Stein (1977)	Paintings in general (artists who died before 1946)	1946-1968	Average price (Geometric mean)	10.47% (U.S./£) 10.38% (U.K./$) 13.12% (U.K./£)		14.3%
Baumol (1986)	Paintings in general	1652-1961	Geometric repeat sales (double sales)		0.55%	2.5% (rough estimate)
Frey and Pommerehne (1989a)	Paintings in general	1635-1987 1635-1949 1950-1987	Geometric repeat sales (double sales)		1.5% 1.4% 1.6%	3.0% 3.3% 2.5%
Ginsburgh and Schwed (1992)	Flemish-Dutch, French, Italian Old Master drawings	1980-1991	Hedonic	10.5% 14.0% 9.0%		
Buelens and Ginsburgh (1993)	Paintings in general	1700-1961	Repeat sales	0.65% (all resales) 0.87% (resales beyond 20 years)		2.5%
		1750-1961	Hedonic	0.91%		
Goetzmann (1993)	Paintings in general	1716-1986 1850-1986 1900-1986	Repeat sales	3.2% 6.2% 17.5%		1.5-4.5% 2.6-4.2% 4.7-4.9%
Holub et al. (1993)	Watercolor paintings in general Drawings in general	1950-1970	Average price (geometric mean)		15.8% 11.3%	
Mok et al. (1993)	Modern Chinese paintings (created after 1911)	1980-1990	Geometric repeat sales (double sales)	52.9%		13.3-154.4%
Pesando (1993)	Modern prints Picasso prints	1977-1991	Repeat sales		1.51% 2.10%	2.23-8.14%
de la Barre et al. (1994)	European paintings in general (artists born after 1830): 'Great Masters', 'Other Masters'	1962-1991	Hedonic	 ~12.0% ~ 6.0%		Lower (stocks)
Gérard-Varet (1995)	Paintings in general (artists born after	1855-1914 1915-1949 1950-1960	Hedonic		6.2% -2.0% 22.6%	

	1830)	1961-1988			6.8%	
		1976-1988			13.3%	
Agnello and Pierce (1996)	American paintings (artists born before 1939)	1971-1992	Hedonic	9.3%	3.25%	7.4-13.1%
		1971-1979		6.3%		
		1980-1992		14.3%		
Chanel et al. (1996)	Paintings in general (artists born after 1830)	1855-1969	Hedonic		4.9%	
			Repeat sales		5.0%	
			Geometric repeat sales (double sales)		5.9%	
		1855-1914			6.9%	
					6.0%	
					14.9%	
		1915-1949			-3.1%	
					-3.7%	
					-3.2%	
		1950-1960			22.4%	
					23.8%	
					18.4%	
		1961-1969			4.3%	
					11.3%	
					6.8%	
		1950-1969	Hedonic		13.8%	Lower
Fase (1996)	19th century European paintings	1946-1966	Modified composite (basket)	11.0%	7.5%	4.7-6.7% (nominal) 1.2-3.2% (real)
		1972-1992		10.6%	1.1%	11.2-14.8% (nominal) 1.7-5.3% (real)
		1982-1992		8.6%	2.9%	10.3-19.2% (nominal) 4.6-13.5% (real)
Goetzmann (1996)	Paintings in general	1907-1987	Repeat sales		5.0%	
Pesando and Shum (1996)	Picasso prints	1977-1993	Repeat sales	12.0%	1.4%	
Candela and Scorcu (1997)	Modern and contemporary paintings	1983-1994	Representative painting (Modified average price)	1.92% (semi-annually)		Higher
Czujack (1997)	Picasso paintings	1966-1994	Hedonic		8.3%	
Ginsburgh and Penders (1997)	European Great Master,	1972-1991	Hedonic	15.8%		
	American paintings			15.5%		
	Conceptual,			18.9%		
	Minimal,			23.8%		
	Land art			20.0%		
Pesando and Shum (1999)	Picasso prints	1977-1996	Repeat sales		1.48%	2.29-9.13%
Landes (2000)	Ganz collection		Geometric repeat sales (double sales)	16.77% (1997 sale)	11.74%	12.76-15.86% (nominal) 7.81-10.85% (real)
				28.69%	20.67%	10.56-14.84%

				(1986 sale)		(nominal) 3.66-7.68% (real)
				19.77% (1988 sale)	14.29%	10.68-15.50% (nominal) 5.39-10.11% (real)
Agnello (2002)	American paintings	1971-1996	Hedonic	4.2%	-1.2%	7.1-11.6% (nominal) 1.7-6.2% (real)
Mei and Moses (2002a)	American, Impressionist and Old Master paintings	1875-1999 1900-1999 1950-1999	Repeat sales		4.9% 5.2% 8.2%	1.8-7.4% 1.1-7.4% 1.3-9.1%
Renneboog and Van Houtte (2002)	Belgian paintings (created between 1850 and 1950)	1970-1997/ 1970-1989/ 1980-1989/ 1980-1997 1980-1997/ 1980-1989	Average price (Geometric mean) Composite (basket)	7.6%/ 13.7%/ 16.0%/ 9.0% 8.6%/ 31.2%	2.4%/ 8.5%/ 11.8%/ 3.8% 3.4%/ 26.0%	7.3-9.9%/ 8.3-9.2% (nominal) 2.1-4.7%/ 3.1-4.0% (real)
	Belgian oil paintings	1970-1997/ 1970-1989	Average price (Geometric mean)	9.8%/ 16.8%	4.6%/ 11.6%	
	Belgian paintings Belgian oil paintings	1970-1997/ 1970-1989 1970-1997/ 1970-1989	Hedonic	5.6%/ 8.4% 7.6%/ 10.2%	0.4%/ 3.2% 2.4%/ 5.0%	
Goetzmann and Spiegel (2003)	Contemporary, Impressionist and Old Master paintings	1985-2003	Repeat sales	-1.2%		
Worthington and Higgs (2003)	Contemporary Master, French Impressionist, modern European, 19th century European, Old Master, Surrealist, 20th century English, modern American paintings	1976-2001	Composite (basket)/ Average price (Geometric mean)	4.21% 3.70% 2.14% 2.46% 2.81% 2.03% 2.55% 3.32%		5.17%
Candela et al. (2004)	Modern and contemporary, 19th century, Old Master paintings	1990-2001	Quality-adjusted price	2.52% 1.80% 2.06%		
Edwards (2004)	Latin American paintings	1981-2000	Hedonic		9%	
Hodgson and Vorkink (2004)	Canadian paintings	1968-2001	Hedonic	7.6%	2.3%	8.2-14.2% (nominal) 3.0-9.0% (real)
Worthington and Higgs	Paintings in general	1976-2001	Composite (basket)/	2.54%		6.49-16.82%

(2004)	(6 sub-markets)		Average price (Geometric mean)			
Campbell (2005)	Paintings in general	1976-2004	Composite (basket)/	6.11%	1.44%	10.5-12.0% (nominal)
	American paintings		Average price	8.16%	3.66%	
Higgs and Worthington (2005)	Australian paintings	1973-2003	Hedonic	6.96%	0.40%	
Campbell (2007)	Paintings in general	1980-2006	Composite (basket)/	6.56%		8.36-14.91%
		1990-2006	Average price	1.26%		6.52-12.10%
		2000-2006		3.56%		-1.28-19.10%
Worthington and Higgs (2006)	Contemporary Australian paintings	1973-2003	Hedonic	4.82%		7.0%
Kräussl and van Elsland (2008)	German paintings in general	1985-2007	2-step hedonic	3.8 % (in $) 1.3 % (in €)		3.0-10.12%
Pesando and Shum (2008)	Modern prints	1977-2004	Repeat sales		1.51% 2.83% (sold at 4 main auction houses)	-0.13-8.55%
	Modern prints excluding Picasso				1.19%	
	Picasso prints				2.91%	
	Picasso *Vollard Suite*				3.93%	

Source: own compilation based on the above mentioned studies, as well as Ashenfelter and Graddy (2006), Burton and Jacobsen (1999), Campbell, Campbell and Pullan (2006), Fase (1996, 2001), Frey and Eichenberger (1995b).

[1] For an extensive review of the literature on the financial performance of collectibles in general see Burton and Jacobsen (1999).

[2] Only the lowest and highest rates of return on alternative assets classes mentioned by the authors are presented.