



Art Photography Prices

In the auction market

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1. Introduction

The exploration of the art market is a real challenge. It's as fascinating as being on a coastline, because it is the place where two different worlds meet. In this case the art world meets the financial world. The art market is one of the main reasons why art has flourished the past few centuries. The socioeconomic history, the shaping of societies, trends and beliefs and also science allowed art to evolve and create artists whose art legacies have become and will continue to be symbols of human civilisation. Cultural economics has a potential interest in the art market as well as other cultural fields. Cultural economists walk the coasts where culture meets economy.

For people outside the art world, the art market has been almost identified with the market for paintings and perhaps sculpture, which makes sense because of the international popularity of certain artists, education on art history in most schools etc. Of course painting and sculpture have a history of thousands of years, while other media are relatively new, like for example photography which will celebrate 200 years of official history in 2039. Photography, mainly because of its vast commercial use, has been a target of heavy criticism concerning its artistic validity from the very beginning. Walter Benjamin's criticism on certain art styles such as abstract photography and futurism in photography is a prime example.¹ It has taken a lot of photographic work by the people who are called today masters of photography as well as argumentation from experts to mature the idea that a mechanised medium can create artistically important artworks. Today the art market has accepted photography as a fine art medium and photographs are sold in galleries and auction houses. This is a sign that art photography of various periods from the last 150 years is being considered more and more as an art investment by buyers.

The study of the art market is interesting as it is difficult. People involved in the art market are not willing to share information, especially when it comes to economic terms. Artists show great reluctance with anything that has to do with the word "price", as they are more interested in the intangible nature of their art rather than the pecuniary part. Dealers are also reluctant in talking about figures. Olaf Velthuis in his book "Talking Prices"² explains his quest in interviewing gallery owners, art dealers and other agents in the art market and their apparent distrust

¹ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.

² Velthuis, O. 2005. *Talking Prices*. New Jersey, Princeton University Press.

against economists. This is a relationship that has to be structured and established on common grounds which inevitably takes time.

This thesis's goal is to confirm or reject whether photography should be examined separately from the visual arts such as painting or even reproducible artworks such as prints and to explore this segment of the art market from a bird's eye view. Does photography deserve to be considered a special category among other visual art categories or does it follow the exact same paths in matters of price formation and sales? My personal interest and background in photography were the determining factors in deciding my thesis topic. Even though there is an abundance of literature concerning visual arts economics in general, the mentioning of photography specifically is somewhat scarce or even non-existent. This fact was my motivation to make a study that could fill this gap and investigate the possible differences between photography and the visual arts in general in terms of their presence in the art market and especially in the formulation of the price. The fact that it is a non investigated field made it even more interesting to start a research. Of course soon the limitations of describing a whole market on photography in a short period of time like the one of a master thesis drove me to the studying of a particular part of that market where useful data could be obtained. The lack of appropriate data concerning the primary market enables the use of auction data which is published and easier accessible, in this case the auction market for contemporary photographs. Auction houses are the ones that reveal the highest willingness to pay on specific items, and photography is gradually becoming part of this process. Especially after the year 2000 some constantly increasing top-sales figures are rather striking, showing that the ceiling has not been reached yet.

The analysis of this thesis makes use of data concerning 12 contemporary art photographers, who are also presented in a brief manner along with some historical background of art photography and photographic museums; afterwards it presents some interesting descriptive statistics concerning their work, where the most important photography auctions take place and by which auction houses; it then goes on to identify the possible predictors of price with the use of linear regression models. Literature has already been composed by several studies exploring the determinants of prices mostly for paintings. Pesando³ is the first who constructs an art price index for repeat sales of prints, which means reproducible artworks like silk screen prints, lithographs, woodcuts etc. Photography also falls into this category even though it is not mentioned in Pesando's study. Photographs are also printed out in editions of a

³ Pesando, J. 1993. Art as an investment: The market for modern prints. *The American Economic Review* vol.83, pg. 1075.

number of exemplars or can also be unique prints and therefore may behave as unique as well as reproducible artworks.

The structure of this thesis goes as follows: A literature review presents in short several theoretical topics that represent the foundation on which the entire study is built on, namely the art market and its segments and afterwards the auction houses and art price theory. Several determinants are described and connected to various references in the literature of cultural economics. Then the literature review concludes with a presentation of studies that have been carried out concerning art price index construction, art as investment which is closely related and a distinction of the various methods that have been used to analyse databases.

In the third chapter there is a concise history of photography to allow the reader to acquire a general view of what is photography and how it has evolved until the present day mainly from the aesthetic point of view with some important technological breakthroughs. Some of the most important names in the history of the medium are mentioned alongside with well known photographs of them. This was meant to give a written but also visual timeline to the reader and describe the influences these people had on the contemporary photographers of the sample. The chapter ends with a historical overview of photographic museums from the 19th century until nowadays.

In the fourth chapter the data used in the analysis is presented; first of all, the sample of the 12 contemporary photographers is described with a short biography and one picture showing the artwork that has achieved the highest price (or one of the highest) for each one. The data description follows with frequency tables for the number of artworks sold per artist and the amount of turnover raised, as well as diagrams showing the market shares of auction houses and cities where the most important auctions take place.

In the methodology part the variables and hypotheses to be tested are shown, along with the regression model that is used in the analysis part. The analysis shows the coefficient tables and subsequently there is a discussion of the results. The appendix shows a variety of information per artist that could not be embodied in the main text.

To summarize, the present thesis focuses on the auction sales of art photography by 12 contemporary artists in an attempt to identify the most important price determinants of photographic artworks.

2. Literature review

In this first chapter I will present the theoretical background of my thesis as well as some previous studies that have been carried out for price formation and price indexing of artworks before.

2.1 The art market

Art market literature usually divides the art market into primary and secondary. Before analysing each of them it is useful to have in mind three elements that help making classifications. These are the “who”, “what”, “where”. So far interpretations have tried to make distinctions based on all these three elements. In 1994, a suggestion was made by Singer and Lynch⁴ to divide the art market into three subcategories, namely the primary, secondary and tertiary market using the following differentiation: in the primary market artists sell their works to dealers and collectors, in the secondary dealers sell to collectors and in the tertiary market collectors and dealers recycle artworks that had been previously transacted in the secondary market. This approach although not widely accepted by others in the field is worth mentioning. One initial observation is the exclusion of auction houses into a separate submarket, the tertiary market.

However, the approach is probably more focusing on “who” deals with whom and not “where” the deal takes place. The artist>dealer>collector flow is the one that describes the sequence of participants in the primary and secondary market, while the tertiary market simply adds another direction between the dealers and collectors (artists>dealers<=>collectors) who continue to transact through the auction houses without the participation of artists – until very recently as mentioned further on. Other economists have commented on this classification as “unnecessarily complicated”⁵ especially since in later years there has been a blending between these categories as dealers participate on both the primary and secondary market and auction houses are extending their reach into the primary market as well. This doesn’t leave much space for a clear segmentation of the market based on all above mentioned elements. Since “who” and “where” are out of focus the only perhaps element left to

⁴ Singer, L., Lynch, G. 1994. Public choice in the tertiary art market. *The Journal of cultural economics* vol.18: 199-216.

⁵ Heilbrun and Gray are commenting on Singer’s article of 1994 in the *Journal of Cultural Economics* No.18: 199-216. It seems that in the general bibliography the tertiary market segmentation is not adopted by other economists.

make a clear cut distinction is the “what”, in other words what is dealt in a sense of whether it is thrown in the market for the first time and what is the time lapse between its creation and its transaction (the dealing of antiquities for instance, which are considered secondary market items).

Photography in the art market exists for almost a hundred years since it was first introduced into the gallery system with Stieglitz’s Gallery 291. (See Historical summary chapter 3). That generation of photographers and the next ones spent their lives advocating for photography’s rightful position among the fine arts. Today the fruits of their arguments have provided us with a richer capital of art photography worldwide and a continuously growing art photography market. Descriptive statistics from the sample data will confirm this in the Data section (chapter 4) of this thesis.

2.2 The primary market

The main distinction that leaves no grounds for misinterpretation is that the primary market consists of all transactions of original artworks that are sold for the first time⁶ by the artists themselves or dealers who have an exclusive relationship with the artist. There is usually little or no information on the buyer’s side which includes a great amount of risk for the potential buyer. In this case the artist may be unknown and presenting his work for the first time in the market or it may be the case of more established artists presenting their latest work. The studio or the gallery is usually the place where the works are shown for the first time and also the place where the first potential buyers are going to visit. Artists typically provide the creative work while gallery owners or dealers provide the market knowledge. Based on previous sales of the same artist or the prices of similar works from other artists of the same genre, a current “feel of the market” and perhaps other kinds of information, a dealer is setting a price for each artwork or group of artworks which is most likely to sell. In cases of new unknown artists prices are kept low and if sales are encouraging, the next exhibition is almost certain to involve higher prices. For this reason galleries are traditionally connected with the term of primary market. However there is a tendency during the recent past years that galleries are also expanding their business into the secondary market, while artists themselves attempt to bypass the dealers and sell their artworks though auctions themselves. One recent example of 2008 was Damien Hirst selling original artworks of his directly through auction

⁶ Heilbrun, J. & Ch. M. Gray. 2001. *The Economics of Art and Culture, second edition*. Cambridge, New York: Cambridge University Press.

without the contribution of other intermediaries. If the primary market could be characterised with a market structure it would most probably be a monopolistic competition. Heilbrun takes performing arts as an example of monopolistic competition but this example could very well be extended to the primary visual art market and especially to galleries as there are enough suppliers that offer physically similar products but from the demand's point of view can acquire different or even unique values (preferences on particular artists or styles). That is why galleries tend to make exclusive deals with artists so that they can be the ones to have a kind of monopoly over their work. Buyers that are searching for new artworks visit exhibitions acquire more information on the artworks on display and begin forming their own preferences.

Olav Velthuis⁷ in his book titled "Talking prices makes a wonderful study on the Dutch primary art market and presents the most important predictors one should bear in mind in order to make an estimate of a contemporary work of art that enters the market for the first time. His findings indicate that the size of the artwork should be the first to take into consideration, as well as the technique that has been used and the price that the artist may have sold to museums. Apart from those the age of artist and his place of residence appear to be the most significant factors while the characteristics of the galleries seem to hardly influence the price.

The art photography primary market is perhaps the most difficult to measure and identify, especially historically, as the percentage of images sold by galleries is relatively quite low in comparison to painting. There is unfortunately no data, which I could acquire, describing this percentage; however the task of tracking down galleries that buy art photographs exclusively or along with other artworks is both challenging and interesting. Especially since during the last decade photography is clearly rising in preference by art collectors as we shall see further on. The fact that this increase is valid for contemporary art in the secondary market declares that the primary market allowed these contemporary artists to rise to fame. Today's famous artists such as the ones in the sample of the analysis are each represented by several galleries from different parts of the globe, especially in cities like New York or London or their home countries.

2.3 The secondary market

The secondary market involves all transactions of existing artworks that have been sold at least once before or works of artists that have passed away and

⁷ Velthuis, O. 2005. *Talking Prices*. New Jersey, Princeton University Press.

therefore their work is determined. In the secondary market, information is much more available to all participants due to the reputation of the artist and as a result the purchase of a recognised artwork entails less risk. In other words, the economic value of an artwork has to be established to a certain level before it can be characterised as an investment option⁸. Be that as it may, this doesn't mean that art as an investment entails less risk than a financial investment especially because of liquidity reasons, however this is a discussion that is not further developed in the course of this thesis. This is why the secondary market attracts more people who want to invest in art with a lower risk rate, and are therefore willing to pay higher amounts of money in order to purchase certain artworks. Auction houses have for this reason become the main suppliers of such artworks. It is not exaggerating to say that auctions are perhaps the only place to examine the levels of willingness to pay for art worldwide. They are perhaps the institutions that maintain the "Veblen effect" more than any other institution active in the art market. The Veblen effect is the tendency to derive quality of an artwork mainly by its sale price⁹.

2.4 Auction houses

McAfee and McMillan¹⁰ give a descriptive definition stating that "an auction is a market institution with an explicit set of rules determining resource allocation and prices on the basis of bids from the market participants." The most famous type of auction which literally dominates the auction market is the English type where prices ascend in open bidding¹¹. The artwork is displayed in front of the potential buyers and the bidding starts low at the so called reserve price determined by the auction house and the price begins to escalate until it reaches its highest bidding point where it is "hammered down" an indication that it is sold at that price (hammer price). Auction theory can go deeper into details on how auctions work in practice, about whether a hammered down item is eventually sold or not, but for the purpose of this research it is not necessary. In the analysis (Chapter 6), the data includes the hammer price as the actual price of the artwork at that very moment.

⁸ Velthuis, O. 2003b. *Visual Arts*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 470-475.

⁹ The Veblen effect is also mentioned by Rengers – Velthuis (2002) and they also refer to Leibenstein's article of 1950: Bandwagon, Snob and Veblen effects in the Theory of consumers' demand. *Quarterly Journal of Economics* vol:64 pg.183-207.

¹⁰ Heilbrun, J. & Ch. M. Gray. 2001. *The Economics of Art and Culture, second edition*. Cambridge, New York: Cambridge University Press.

¹¹ Ashenfelter, O. 2003. *Art auctions*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 32-39.

The market structure for auctions is clearly an oligopoly and more specifically a duopoly, since in 2007¹² “Christie’s generated the largest share of global Fine Art revenue with 38.7%, ahead of its only real competitor, Sotheby’s, with 36%. Together they account for almost the entire volume of global auction revenue since Phillips De Pury, in third place accounts for only 2.6% followed by Poly International Auction (1.8%), China Guardian (1%) and Artcurial (0.9%).” This duopoly appears to be quite strong and is based on the reputation of these two auction houses, the building of which has worked as a restrictive barrier for the entry of new competitive enterprises at least at that level¹³. In other words the cost of creating a reputation as long and strong as Christie’s and Sotheby’s have, is considered impossible for smaller auction houses. This is also reflected on the prices of the artworks that every auction house can achieve. The reputation is inevitably the factor that attracts both important sellers but also important buyers. It is also significant to mention that geographically there is also a clustering of revenue mainly in New York, USA and London, UK. The revenues of auctions held in the United States reaches 43% of global auction revenues and London comes in second place with 30%. Even though the two great auction houses have departments in several cities across the United States and abroad, New York and London seem to be the Mecca and Medina for auctions. If we add the amounts of annual turnover that the major auction houses have in relation to the auction markets’ as a whole, this can only bring us to the conclusion that the auction market is a winner-take-all type of market.

The winner-take-all market¹⁴ is a market that functions in an opposite way than normal markets for various reasons. In normal markets the performance is measured with efficiency and the product or service is rewarded according to that efficiency. In certain domains the difference in this reward is relatively low (manual labour) however in other fields of employment it can be disproportionate. The fact that people are willing to pay these higher figures in order to obtain a product that they could possibly find at a lower cost is what makes the market become winner-takes-all. Superstars are the ones who take most credit through the media and their reputation grows in a continuous manner. The information economy contributes to this growth. Superstars get more and more attention through the mass media and this is reflected in their rewards. The movie industry is such an example. Some Hollywood actors are paid significantly higher than others who could perform almost

¹² Artprice (2008), 2007 Art market trends, Artprice.com.

¹³ Ashenfelter, O. 2003. *Art auctions*. In: Towse, R. (ed.) *A handbook of cultural economics*. Edward Elgar, 32-39.

¹⁴ Source : The Economist (<http://www.economist.com/research/Economics/alphabetic.cfm?letter=W>)

as well for the same role. If one imagines the distribution of fees in this case the upper observations would be extremely high while the median would appear quite low in comparison to the mean. In a normal economy this situation would attract competition and lower the amount of fees of the overpaid actors and would therefore make the distribution of fees less skewed. However the winner-takes-all market allows this skewness to be profound and also creates a tendency for it to increase.

The auction market therefore falls into this category. The auctioneers will very unlikely put anything on for sale if they are not almost certain that it will be within the boundaries of their estimates or hopefully above them. Especially large auction houses like Christie's and Sotheby's base their reputation on the fact that they will have a good percentage of artworks sold within the estimates and of course these prices will be significantly higher than in other auction houses.

Prices of a single artist show great variance when estimated by auctioneers¹⁵. Of course well known artists have higher price ranges from relatively unknown ones but the price formulation is much more complex than that.

Photography in auctions seems to have a relatively short history. The early 90s is the time when the art market showed a particular blossom and brought art photography into the salerooms. The first years seemed more experimental judging from figures (presented in the Data chapter 4) but at the turning of the century the increasing interest of the auction market is apparent.

2.5 The market for visual art

The visual art market is an ideal example to portray the art market, as it involves a great percentage of the art market in general. It is not by chance that most people immediately combine the art market with the market for paintings. As expected the visual art market is also divided into primary and secondary. According to Velthuis¹⁶ some artists sell their artworks directly from their studios or maintain cooperation with intermediaries such as commercial art galleries or art consultants. It is also a fact that the vast majority of visual artists cannot make ends meet just by selling their work in the primary and only a small percentage from those who do, are able to trade their work in the secondary market. In other words only a small number of artworks produced by living artists are traded by auction houses which are the case of this research. This means that a great number of artworks will not exceed the

¹⁵ Moulin, R. 1967. revised and translated in 1987. *The French Art Market: a sociological view*. New Brunswick, Rutgers University Press.

¹⁶ Velthuis, O. 2003a. Symbolic meanings of prices: Constructing the value of contemporary art in Amsterdam and New York galleries. *Theory and Society* vol:32 pg181-215.

boundaries of the primary market and thus not appear in the market ever again. However, the artworks that do come back on the market reveal that they have actually passed a certain process, a crash test that has given them the properties to be handled by secondary market agents such as auctions. And there are several other agents in the arts sector that assist in the formation of such properties. These are called cultural institutions. Cultural institutions can be art schools, exhibition halls, museums, dedicated art magazines etc. Their role is quite essential as they inform and shape the taste of a large part of the demand for artworks whether that is a collector or a dealer. They are the gatekeepers that allocate the demand into this selection of artists. The selection of course is a process of judgement from expert knowledge on the art form, previous artworks that have been successful on the market etc. By selecting this small group of artists, cultural institutions reduce the information and search costs for all agents in the market, especially art collectors, thus enhancing the overall value and credibility of the artists and their work. This process creates the necessary ground for the creation of superstar effects and drives the market into winner-takes-all phenomena.

2.6 Art prices

2.6.1 Previous studies on art prices

In this section there will be a short review of studies carried out so far that deal with price indices, determinants of prices and art as investment using mainly auction data. In terms of method Worthington and Higgs¹⁷ mention three methods that have been used to analyse data; The first is the arithmetic or “naïve” art index method, the second is the repeat sales method which follows the sales of specific artworks that have been sold various times and the third is the hedonic price regression. The oldest and most concrete database that many researchers have been using is the one of Reitlinger¹⁸ (1961, 1970) and Mayer¹⁹ (1971). Anderson²⁰ (1974) investigates old master paintings (18th and 19th century, Impressionists and 20th century artists) for the period of 1780 to 1970 using the Reitlinger data. His findings point out size, year of sale and reputation as the most significant

¹⁷ Worthington, A. Higgs, H. 2006. A note on financial risk, return and asset pricing in Australian modern and contemporary art. *Journal of cultural Economics* vol:30 73-84.

¹⁸ Mentioned in various studies are two books of Reitlinger:

1) Reitlinger, G. 1961. *The economics of taste: The rise and fall of the picture market, 1760-1960*. Holt, Reinhart and Winston, New York.

2) Reitlinger, G. 1970. *The economics of taste: The art market in the 60s*. Barrie and Jenkins Ltd., London.

¹⁹ Mayer, E. 1971. *International Auction records Vol.5*. Mayer and Archer Fields, New York.

²⁰ Anderson, R. 1974. Paintings as an investment. *EconomicInquiry* vol:3 13-26.

determinants. Stein²¹ (1977) also carried out a similar study and computed a consumption return rate for paintings. Baumol²² (1986) also used the same database to conclude the lack of an equilibrium in the art market and the randomness and unpredictability of the prices. Frey and Pommerehne (1989) support Baumol's findings using an even larger sample with more countries and including transaction costs. All four researchers come to the conclusion that art investment returns are lower than other investments. Buelens and Ginsbergh²³ (1993) study the same data as Baumol but trying to stratify the data to explain his results by analysing different periods of sales especially those of political and economic unrest. They use both the repeat sales and the general regression model for all data (like Anderson) and come to the conclusion that by using all the data they are able to produce more significant results but with lower R²s. Goetzmann²⁴ (1993) uses also the Reitlinger data for repeat sales regression to come to his conclusion that stock market and the art market are highly correlated. Pesando²⁵ (1993) uses data from Gordon's Print Price Annual to estimate a repeat-sales regression to make a similar study for prints in comparison to stocks and bonds and makes two indices for Picasso prints and others (Chagall, Miro etc). His findings are in support of previous studies that art does not compare favourably with financial assets and that the art market is overall inefficient. Agnello and Pierce²⁶ (1996) created an index of 66 leading American artists and came to the conclusion that by investing at certain subjects (figure paintings, avant-garde, still life etc) and high priced artworks, the buyers can achieve greater returns and they compare it with Buelens and Ginsburgh's findings that certain paintings are lowering the returns of the whole sample. Czusack²⁷ (1997) examines Picasso paintings sales to check the influence of several predictors and comes to the conclusion that signature and provenance do not have an impact unlike as expected. Candela and Scorcu²⁸ (2001) create price indices for the secondary market of

²¹ Stein, J. 1977. The monetary appreciation of paintings. *Journal of Political Economy* vol:85 1021-1035.

²² Baumol, W. 1986. Unnatural Value: or Art Investment as a Floating Crap Game. *The American Economic Review* vol.58, pg. 933-942.

²³ Buelens, N. , Ginsbergh, V. 1993. Revisiting Baumol's Art as a floating Crap Game. *American Economic Review* vol:37 1351-1371.

²⁴ Goetzmann, W. 1993. Accounting for taste: Art and the Financial Markets Over Three centuries. *The American Economic Review* vol.83 pg.1370.

²⁵ Pesando, J. 1993. Art as an investment: The market for modern prints. *The American Economic Review* vol.83, pg. 1075.

²⁶ Agnello, R. Pierce, R. 1996. Financial returns, Price determinants and Genre effects in American art investment. *Journal of cultural Economics* vol.20 359-383.

²⁷ Czusack, C. 1997. Picasso paintings at auction, 1963-1994. *Journal of cultural Economics* vol:21 229-247.

²⁸ Candela, G. Scorcu, A. 2001. In Search of stylized facts on Art market prices: Evidence from the secondary market for prints and drawings in Italy. *Journal of cultural Economics* vol: 25 219-231.

drawings and prints and conclude that the secondary market price index is influenced by the auction price index and therefore they suggest that auction prices should be considered a benchmark for other institutions in the art market. Drawings, watercolours etc are more valued than prints, engravings etc. The same researchers in another research in 2004 propose a price index adjusted for the quality of the paintings using the ratio of the average market price and the average pre-sale estimate for paintings at auction. According to their findings this method provides results with less volatility than quality unadjusted and hedonic price indices. Valsan²⁹ (2002) uses the hedonic regression model to investigate the relation between market value and nationality by comparing Canadian and American painters. Worthington and Higgs³⁰ (2006) explore the price indices of 50 Australian artists in a period of 30 years and examined the influence of the Australian stock market to the art market. Hutter et al³¹ (2007) compare quoted dealer prices of 100 leading visual artists from 1970 to 2004 with auction price results for works by the same artists.

A work of art can be characterised as a commodity by its properties³². First of all are the physical properties such as the size, the materials used, the labour time that was needed to be completed, date of creation and the name of the creator. However there is also the date and the place of sale that can alter the price of the same artwork. History of art has shown that through the last centuries there were shifts from some properties to others in terms of significance. To put it in a more mathematical form, the variables (properties) in the function (price) showed different factors over time. In the Renaissance for instance, art had a more practical and everyday use and so the price for each artwork was usually fixed and dependent on the cost of production i.e. materials and labour cost. From the mid seventeenth century on, the choice of subject played the major role as historical paintings were considered more highly than ordinary landscapes or portraits. Later on, the signature of the artist played a greater role in determining the price of artwork by the same artist because it acted as a trademark. It was at some point impossible to price an artwork of an artist if it wasn't signed. Apart from the physical attributes of each artwork there are also other factors that can influence the price such as the place and

²⁹ Valsan, C. 2002. Canadian versus American Art: What pays off and why. *Journal of cultural Economics* vol: 26 203-216.

³⁰ Worthington, A. Higgs, H. 2006. A note on financial risk, return and asset pricing in Australian modern and contemporary art. *Journal of cultural Economics* vol:30 73-84.

³¹ Hutter, M. et al 2007. Two games in town: a comparison of dealer and auction prices in contemporary visual arts markets.

³² Sagot-Duvauroux, D. 2003. *Art prices*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68.

the date of sale. The price of every commodity is subject to macroeconomic variables like inflation that change the price as time advances. In a globalised market as today the currency exchange rates also play a role in defining prices of artworks in different parts of the world. This is why it is essential to make the proper deflation techniques and the use of single currency in order to make comparisons on art prices between years. In general it is plausible to divide the determinants of prices into three major categories, as previous studies have done already³³. These are the intrinsic characteristics of the artwork itself, artist-related factors and external factors.

2.6.2 Artwork related price determinants

2.6.2.1 Size of artwork

The dimensions of an artwork are agreed by almost all researchers to be one of the most significant determinants of the price of the artwork³⁴ and is therefore used in all studies as a predictor of price. However some researchers argue that other factors may intervene in the amount of impact that size can have on price eventually. For instance Czusack³⁵ identifies this in terms of the buyer as collectors who represent a great portion of demand are thought to prefer smaller artworks that they can hang on their walls while large artworks usually are preferred by museums. The size – price function follows a concave curve meaning that larger artworks are not necessarily cheaper but the marginal price drops as size grows beyond a certain surface limit. Other researchers such as Rengers and Velthuis³⁶ mention that the fact size is used as a determinant is an institutionalised rule of pricing adopted by galleries and dealers. Today's examples of expensive small sized artworks are few and are usually because of the dominating effects of other determinants such as scarcity or reputation of the artist.

³³ Referring to Sagot-Duvaurox, D. 2003. *Art prices*. In: Towse, R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68 and Rengers, M. Velthuis, O. 2002. Determinants of prices of contemporary art in Dutch galleries 1992-1998. *The Journal of cultural economics vol.26: 1-28*.

³⁴ Frey, B., Pommerehne, W. 1989. *Muses and markets. Explorations in the economics of the arts*. Basil Blackwell, Oxford, UK.

³⁵ Czusack, C. 1997. Picasso paintings at auction, 1963-1994. *Journal of cultural Economics vol:21 229-247*.

³⁶ Rengers and Velthuis actually quote this from one of their sources i.e Hans Abbing (1989) *Een economie van de kunsten. Beschouwingen over kunst en kunstbeleid*. Historische Uitgeverij, Groningen.

2.6.2.2 Medium used – materials

According to Sagot Duvaurox³⁷, the materials used for the creation of the artwork, influence its price. Rengers and Velthuis³⁸ also agree on this with the results of their study on Dutch galleries mentioning that oil works are priced higher than watercolour and canvas is also priced higher than paper. They also mention the examples of reproducible artworks that are produced in editions such as lithographs and silk screen prints which are less costly to produce per unit than a unique work. The case of photography could not be different. Photographers usually print their works in editions of 50 or 100 exemplars or even less. This depends on the method used and how mechanised the whole process can be. For instance the use of a darkroom by the artist himself or the use of a professional lab creates differences in matters of total cost and labour time discussed below. Also, colour photographs for instance printed in a darkroom in the conventional way (film exposure on paper) is much more expensive than doing so in a professional photo-lab. Different materials and methods can increase the price per print but do not necessarily indicate a higher price of sale. This has probably more to do with lack of information on behalf of both galleries and buyers as to the true costs of taking a picture and printing it which of course can vary greatly in actual numbers.

2.6.2.3 Labour time

Labour time and therefore labour costs is another factor that is usually combined with the technique or method used. This factor has not been taken into much consideration by researchers and is probably combined with technique, material and medium to indicate its impact on the price function. In the past this determining factor used to play a significant role in calculating the reward of the artist, as artists were considered more like technicians and decorators rather than artists as we consider them today. In the modern era, the process of creating art is not taken into account and the judgement is based mostly on the aesthetics of the result.

³⁷ Sagot-Duvaurox, D. 2003. *Art prices*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68.

³⁸ Rengers, M. Velthuis, O. 2002. Determinants of prices of contemporary art in Dutch galleries 1992-1998. *The Journal of cultural economics vol.26: 1-28*.

Of course it is implausible to define a standard labour time and cost for each technique but this variable should probably be examined more thoroughly.

2.6.2.4 Date of creation – Age of artwork

The age of the artwork is also important in determining the price because it places it in a genre, defines its scarcity and perhaps historical importance. As Hutter³⁹ explains, studies over the impact of the age of artworks has been carried out by Galenson and Weinberg in 2000 and Landes also in 2000. Their results showed significant positive effects of the age of artworks⁴⁰. In the case of photography, the various techniques that were used in the 19th century and the beginning of the 20th century give an approximate estimation of the period the pictures were taken, as the technological changes enabled photographers to shift to the new and more efficient technique. Of course, as the distribution and information channels were less developed back then some people in countries far from the United States or western Europe continued to use materials and techniques of older technology because of lack of information, supply or cost.

2.6.2.5 Provenance

Provenance indicates the origin of the artwork and perhaps its previous owners. This acts as a positive bias for potential buyers especially in the case of auction houses. Certain buyers feel more secure to acquire an artwork of prestigious provenance so that they can have an additional guarantee that their purchase will not lose its value or historical importance in due course.

2.6.2.6 Signature - authenticity

Signature and authenticity are quite correlated. It is usually the existence of a signature that verifies the identity of the artist and therefore allows for his characteristics (fame, technical skill etc) to influence the value of the certain artwork. There are also cases when unsigned artworks are attributed to certain artists because of similar characteristics which are identified by experts. Nevertheless, the

³⁹ Hutter, M. et al 2007. Two games in town: a comparison of dealer and auction prices in contemporary visual arts markets.

⁴⁰ Hutter also mentions another study of Singer (1990) and that these studies by Galenson and Landes have given further support to Singer's hypothesis of "artist capital stock".

existence of a signature adds to the value of the painting and gives the buyer or consumer a sense of prestige⁴¹.

2.6.3 Artist related price determinants

2.6.3.1 Reputation

The artist's reputation is of profound importance for the estimation of the price. It summarises the value of his or her creations and is perhaps the most important reason why a potential buyer would invest in an artwork and place the highest bid at an auction. Reputation should not be confused with talent in this manner as it is shaped by expert opinion. According to Bonus and Ronte⁴² "reputation matters when imperfect information is involved in which case the dynamics of how reputations are established"... "the economic value of an artwork depends on its credibility, which is created by the interaction of various insider experts who are in command of cultural knowledge"... "Cultural knowledge includes subjective elements though". This means that according to their research, there are no objective criteria to ascertain the quality of an artwork even though Frey and Pommerehne's⁴³ empirical results suggest that an objective aesthetic evaluation does exist. Where talent is concerned Rosen⁴⁴ argues that "talent has a multiplicative effect on reward, which implies that small differences in talent may result in large differences in earning". Adler⁴⁵ is somewhat more strict when stating that "large differences in earnings could exist even where there are no differences in talent". Beckert and Rössel in their study in 2004⁴⁶ used auction and gallery data combined with a database compiled by the Capital Kunstkompass show that the value of an artist is a process of building a reputation through experts and institutions in the auction as well as the dealer market. Schönfeld and Reinstaller⁴⁷ in their study of the primary market state also that prices show an "anchoring effect" of prices depending on the growing reputation of the artists and the galleries. Price decreases are usually

⁴¹ Czusack, C. 1997. Picasso paintings at auction, 1963-1994. *Journal of cultural Economics* vol:21 229-247.

⁴² Bonus, H. Ronte, D. 1997. Credibility and Economic Value in the visual Arts. *Journal of cultural Economics* vol:21 103-118.

⁴³ Bonus and Ronte refer to Frey and Pommerehne's book *Muses and Markets – Explorations in the Economics of the Art*. Basil Blackwell, Oxford (1989).

⁴⁴ Rosen, S. 1981. The economics of superstars. *American Economic Review* vol:71 845-858.

⁴⁵ Adler, M. 1985. Stardom and talent. *American Economic Review* vol:75 208-212.

⁴⁶ Mentioned in: Hutter, M. et al 2007. Two games in town: a comparison of dealer and auction prices in contemporary visual arts markets.

⁴⁷ Schoenfeld, S., Reinstaller, A. 2007. The effects of gallery and artist reputation on prices in the primary market for art: a note. *Journal of cultural Economics* vol:31 143-153.

avoided as they act as reputation loss for both galleries and artists. A possible decrease would mean that either the artist lost his audience for some reason or that the gallery has lost faith in the artist's talent. Be that as it may, it still remains a question of who is the most appropriate critic when it comes to an artwork which is priced higher than others. When it comes to consumers, researchers agree that the cultural consumption requires knowledge about the artist, his work and preferably other artists of the same style. However, the extensive study of an artist and his work will inevitably make the individual a sort of expert provided that he or she has access to abundant information concerning the artist. When it comes to visual arts the important step in building a reputation is to exhibit one's work and receive appraisal by experts and the audience. The artist's reputation is also correlated with the reputation of the gallery that represents him or her.

2.6.3.2 Age

According to Sagot Duvaurox⁴⁸ the age of the artist has a positive influence on the price as older artists have simply much more time to establish their reputation and therefore the price level of their artworks. Agnello and Pierce's⁴⁹ study on a large sample of paintings by 66 American artists comes to the conclusion that the age of the artwork has a positive, albeit non linear relation to the artwork price. The age of the artist at the time of creation can create a bias to the buyer as it indicates a possible period during which the artist followed a certain style and also the amount of supply that lies before or beyond this age limit.

2.6.3.3 Gender

Gender seems to have a traditional bias for lower prices when it comes to female artists. However the exact impact of this characteristic alone has not been examined fully. In the case of photography which is a much younger medium in comparison to painting which is dominated by male artists in its long history, things seem to be different as the history of photography has several important female creators to present and as shown in the data sample of this thesis their price levels can be quite high.

⁴⁸ Sagot-Duvaurox, D. 2003. *Art prices*. In: Towse, R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68.

⁴⁹ Agnello, R. Pierce, R. 1996. Financial returns, Price determinants and Genre effects in American art investment. *Journal of cultural Economics* vol.20 359-383.

2.6.3.4 Education – Influences

The beginning for a new artist and the building of his reputation has to have proper foundations. These foundations can either be pure talent without artistic education, extensive education and practice besides an artist and of course both. This is an aspect that has not been studied adequately in terms of price determination. Apart from talent, the education and practical experience of the artists is usually not taken into consideration. The question therefore is whether an educated artist in a well known art school is more likely to taste success than one that had lesser or no education. In the case of photography this is also interesting as many artists are self taught or they have visited a certain art school. Many of them also follow painting classes and then choose photography as their medium of creation. However it is indeed to differentiate the term talent and the term education as they clearly overlap with education shaping and talent and creativity greatly.

2.6.3.5 Death effect

There are also other kinds of factors that are linked to the life of the artist (death is the most common example) and can influence the price levels of all of his or her works. This effect has been studied by Ekelund⁵⁰ based also on other studies (Agnello and Pierce, Czusack) which also come across to this effect in their analyses. Their conclusions on their analysis of 21 Latin American artists who died between 1977 and 1996 is that there appears to be a “death effect” with prices rising substantially just after the artist passes away; however the prices fall immediately thereafter. They attribute this phenomenon to the expectations of the demand side concerning the apparent scarcity of the works of the artist as there is no future supply, and compare it to the case of a durable goods monopolist as identified by Ronald Coase in 1972. Coase’s argument lies to the fact that if suppliers have the ability to control scarcity of their product they can charge the consumer with a monopolistic price.

Where art is concerned, one case is the “death effect” and another is whenever the artist can make a contractual agreement with the buyer to ensure him that his acquisition is unique or of limited supply. In the case of reproducible artworks such as lithographs, woodcuts and of course photographs which is the main topic of this study, artists tend to limit the edition of particular works by either destroying the prototypes (plates, negatives etc) or making legal agreements like contracts or wills

⁵⁰ Ekelund, R. et al. 2000. The “Death Effect” in Art prices: a demand side exploration. *Journal of cultural Economics* vol:24 283-300.

that do not allow the reproduction of the image. One such example in the field of photography is Richard Avedon (1923-2004) who stated explicitly in his will that no further printing or reproduction of his negatives is allowed by anyone for any reason except from contact printing for study purposes. This means practically that the existing prints are the only prints that can ever enter the art market therefore the supplied quantity is now fixed. This of course has an impact on the value of the existing prints, especially those that are already in the secondary market. Even though a commercial photographer himself, his will states that no commercial or non commercial exploitation of his images is allowed.⁵¹

2.6.4 External price determinants

2.6.4.1 Expert opinion – estimation

Experts as discussed above are the catalysts in determining the value of an artwork and consequently an artist, by contributing to the growth of reputation.⁵² They are also usually the ones that potential buyers rely on to acquire information on artists⁵³ and therefore minimize the information and transaction costs for the purchase of a certain artwork. This can lead to a superstar effect by narrowing down the number of selected artists which creates an increase to their prices.⁵⁴ Experts are also the ones that determine the whereabouts of the most successful sales. For instance Czusack⁵⁵ while studying Picasso auction sales, she attributes higher prices in New York to expert statements. Moreover she verifies this statement by showing a 58% turnover share for the United States while Great Britain and France follow with 28% and 13% respectively. It is therefore rational to assume that the estimations that experts are calculating for each artist are a representative figure of the artist's reputation with the reserve price being more to the real estimated value and the upper end expressing the desired new level for future transactions.

⁵¹ The information concerning Avedon's will is published online by www.allbusiness.com in an article titled: Iron Will: Richard Avedon Leaves A \$60 Million Fortune? With Strict Instructions. By Lisa Selin Davis. Published on 2nd June, 2006. Consulted on 7th July 2009.

⁵² This is the same reference mentioned in 2.6.2.1 Reputation of the artist, quoting Beckert, J. Rössel, J. 2004. Kunst und Preise. Reputation als Mechanismus der Reduktion von Ungewissheit am Kunstmarkt. *Kölner Zeitschrift für Soziologie und Sozialpsychologie* vol:56 pg32-50.

⁵³ Sagot-Duvaurox, D. 2003. *Art prices*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68.

⁵⁴ Velthuis, O. 2003b. *Visual Arts*. In: Towse. R. (ed.) *A handbook of cultural economics*. Edward Elgar, 470-475.

⁵⁵ Czusack, C. 1997. Picasso paintings at auction, 1963-1994. *Journal of cultural Economics* vol:21 229-247.

In general there is an effort on behalf of dealers for prices per artist to rise. Velthuis⁵⁶ notes that most dealers ignore the concept of price elasticity and are therefore price and not profit maximizers. This is due to the perception that the rise of price indicates success for the artist and for the institution that carries out the transaction (gallery, auction house) and is also a confirmation of quality (Veblen effect). The cases where the price is lowered are scarce and have mostly to do with failure to sell in the past usually at auctions. According to Beggs and Graddy⁵⁷ “if buyers are attempting to learn about the true value of an item, which is common to all buyers, then past failure can lead to lower prices.” Moreover, reserve prices can “both increase and decrease the final observed price. In an art auction it is also possible that failure may indicate that the owner has a high reserve price”...“the seller may lower his reserve price because of an urgency to sell.”

2.6.4.2 Economic factors – Comparison with other markets

The state of the economy plays an important role in the performance of the art market. When it comes to art as an investment then it is generally observed that in times of economic growth the art market is influenced positively. Potential investors may be interested to invest in art when they have experienced profits in the stock market or the real estate market but that is not an absolute rule⁵⁸. Baumol⁵⁹ characterised art investment as a floating crap game by comparing the stock market with the art market; the works of well known artists are more likely to show random behaviour because the formation of an equilibrium in the art market is less possible than in the manufacturing sector. Pesando⁶⁰ who is dealing with auction prices for prints, states that “the risk of investment in prints is comparable to the risk of investing in stocks or long term bonds,” and therefore concludes that art investment does not compare favourably with other traditional investments. Goetzmann and Spiegel⁶¹ find “evidence of a strong relationship between the demand for art and

⁵⁶ Velthuis, O. 2003a. Symbolic meanings of prices: Constructing the value of contemporary art in Amsterdam and New York galleries. *Theory and Society* vol:32 pg181-215.

⁵⁷ Beggs, A. Graddy, K. Failure to meet the reserve price: the impact on returns to art. *Journal of cultural Economics* vol:32 301-320.

⁵⁸ Frey, B., Pommerehne, W. 1989. Muses and markets. Explorations in the economics of the arts. Basil Blackwell, Oxford, UK.

⁵⁹ Baumol, W. 1986. Unnatural Value: or Art Investment as a Floating Crap Game. *The American Economic Review* vol.58, pg. 933-942.

⁶⁰ Pesando, J. 1993. Art as an investment: The market for modern prints. *The American Economic Review* vol.83, pg. 1075.

⁶¹ Goetzmann, W. Spiegel, M. 1995. Private value components and the winners curse in an art index. *European Economic review* vol.39 pg. 549-555.

aggregate financial wealth over the very long term, manifested by the fact that the art index and an index of London Stock Exchange shares over the same period are highly correlated.” Their results support Baumol’s view of how the stock market dominates the course of the art market. They also give an example by the auction market when saying that “extraordinary prices obtained at auction for paintings such as Van Gogh’s Sunflowers occurred during an unprecedented decade for global stock investment.” Worthington and Higgs⁶² conclude that there is a causal relationship between returns in the stock and the art market, however this relationship is not exact.

Inflation is another issue that has caused controversy; Goetzmann⁶³ notes that even though returns to art investment exceed inflation rates over long periods of time, the risk is still significantly high in comparison to other forms of investment. Agnello and Pierce’s study⁶⁴ also shows returns above inflation for most artists or their period of 1971 to 1992. Frey and Pommerehne⁶⁵ on the other hand refer to art investment as a hedge for times of high inflation in the long run.

At this point the theoretical part is concluded. After referring to previous studies, the next chapter will attempt to familiarize the reader with the history and origins of the photographic medium and photographic museums. Even though a single chapter is not enough to lay out details, some strategic points of photographic history along with the some of the most important names give an overall satisfactory general idea.

⁶² Worthington, A. Higgs, H. 2006. A note on financial risk, return and asset pricing in Australian modern and contemporary art. *Journal of cultural Economics* vol:30 73-84.

⁶³ Goetzmann, W. 1993. Accounting for taste: Art and the Financial Markets Over Three centuries. *The American Economic Review* vol.83 pg.1370.

⁶⁴ Agnello, R. Pierce, R. 1996. Financial returns, Price determinants and Genre effects in American art investment. *Journal of cultural Economics* vol.20 359-383.

⁶⁵ Frey, B., Pommerehne, W. 1989. *Muses and markets. Explorations in the economics of the arts.* Basil Blackwell, Oxford, UK.

3. A historical summary

3.1 Introduction

In this chapter I will try to lay out a summary of some of the key points in the history of photography in order to make the understanding of contemporary photography and the work of the artists of the sample more feasible. The writing of a concise history of photography is always risky as there is usually a chance that some artists are not mentioned to the extent of their true impact on the medium. In the constraints of this study, some major key-points in the history of photography will be given, which explain to a certain degree the relation between painting and photography. Some people may also call it rivalry, but in any case this chapter is focusing on the photography side and how this medium evolved technically and aesthetically to become part of the fine arts.

3.2 The foundation of physics and chemistry

Light, the energy that makes things visible, has been studied by civilisations throughout history, especially those who managed to make a safe distinction between science and religion. The ancient Greeks were the first that discovered laws in the way light changed its course when reflected by polished surfaces and the mathematical disciplines that characterised these laws⁶⁶. Philosophy and science were closely related at those times as different theories succeeded one another in a quest to understand the nature of vision and light. Plato (427 – 347 BC) for instance taught that sensitive rays came from the eyes as a form of energy, they reflected on things and made them visible. Aristotle (384 – 322 BC) one of Plato's students taught on the other hand that things themselves reflected the light rays that hit the eye thus making them visible. As is known today Aristotle's opinion prevailed as it was accepted by other scientists such as Euclid and Ptolemy. Ancient Greeks were also aware of substances that reacted to sunlight in various ways but did not when kept in darkness. Mythology in this case unveils its hidden elements of scientific knowledge, preserved by the narrative power of the myth. Eder mentions a poem by Sophocles, where the death of Hercules is described. Hercules died when he wore a garment dipped into the poisonous blood of the centaur Nessos, which created burns while sticking to his skin. This poisonous solution was kept in total darkness until it started

⁶⁶ Eder, J.M., 1978. *History of photography*. New York. Columbia University Press. 4th edition.

to react with sunlight. Even though they did not manage to combine these two sciences, i.e. physics (optics) and chemistry, in order to invent photography as we know it today, they certainly provided the fundamental knowledge for scientists of later times to do so. To honour them the new invention was called photography, meaning in Greek “writing with light”.

3.3 Photography did not happen accidentally

The official date that photography was announced as a patented invention is the 19th August 1839. However photography was not invented by one person as one would expect⁶⁷. This invention was the result of favouring economic, political and social circumstances, as well as adequate scientific development and the careful observation and work of some creative people. The beginning of the 19th century was starting to show the effects of the age of Enlightenment, the scientific blooming, the beginning of nationalisation and industrialisation. The bourgeoisie class was becoming more and more powerful, demanding to have some of the things that one or two centuries ago would be a luxury only for the eyes of aristocrats. This could only be possible with machines, which could help people overcome some of the basic constraints of their lives such as transportation (steam engine) and so on. Looking back at the 19th century one could say that the birth of photography was the invention of another machine that was able to capture and reproduce realistic images of nature. Until that time painters and designers used the camera obscura (dark room) as a means to draw more realistically. The camera obscura is a totally dark room that concentrates, by means of a hole or a lens, the rays of light onto the surface on the opposite side, thus creating an upside-down image of the scene. This principle was first described by Aristotle and thanks to Arab alchemists of the 11th century it reached the Renaissance and Leonardo Da Vinci who was the first to fully describe the camera obscura. From that point on it was used occasionally to assist painters. By the time of photography it was used extensively to produce realistic sceneries, portraits (silhouettes) etc. There was a way to form a realistic image but there was still no other way to capture it on paper and sustain it but to draw by hand and the process of making additional copies was as difficult as making the original. Chemistry on the other hand had also evolved to allow experimentations with light sensitive materials, how to make them light sensitive, how to make the image visible and finally to be able to maintain that image (fix it). The people that actually managed to combine these factors are the inventors of photography. The title “father of

⁶⁷ Frizot et al. 1994. *History of photography*. Koeln, Koenemann Vmbh. Edited by Michel Frizot.

photography is divided today among several people however the most attributed are Joseph Nicéphore Niépce⁶⁸, Louis Jacques Mandé Daguerre⁶⁹ and William Henry Fox Talbot^{70 71}. It is also notable how these people developed their processes at approximately the same time period from the 1820s until the late 1830s. Of these processes some were developed furthermore and others were abandoned due to their weaknesses. The abandoned processes continued to be used or were rediscovered at later times by passionate amateurs and are commonly regarded today as alternative photographic processes, used almost exclusively for artistic purposes.

During the last two decades a revolutionary change has altered the world of photography in the form of digitalisation. Film is no longer the most efficient means of capturing an image giving its place to electronic sensors. Chemistry therefore has given most of its place in the photographic medium to physics and its specialisation, electronics. Commercial photography was the first to embrace the new medium due to its great improvements in controlling results and efficiency, but photographers also use digital technology for artistic reasons as well. This fact, as every change in technology and methods, has created a quarrel concerning aesthetics, quality and artistic value, like stone creating ripples on a still pond. It is empirically known that the pond will become still again at some point in the future.

3.4 Photography as fine art and the different genres

The great exhibition at the Crystal Palace in London in 1851 was probably the first time the public became aware of the possibilities of the new medium. The initial impact of the photographic invention was striking for the art world. Eugene Delacroix stated that "Painting is now dead". There was now a mechanical way of creating realistic images that a painter or graphic designer would possibly reach with much more time and skill. Photography certainly forced commercial portraitists and scenery painters to become photographers or change their profession. The commercial character of photography was and is the main reason why it has strived to be recognised as an art. Photographers since photography was invented have tried to be regarded as artists. Especially after the 1850s where photographers had a process that they could rely on more or less, they also had the impression they would

⁶⁸ Joseph Nicéphore Niépce (1765-1833)

⁶⁹ Louis Jacques Mandé Daguerre (1787-1851)

⁷⁰ William Henry Fox Talbot (1800-1877)

⁷¹ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.

become part of art history. Photography's effort to imitate compositions of paintings shows part of this effort. Oscar Rejlander⁷² made such a photographic composition called "The two ways of life" in 1857, a print that consisted of nearly thirty different negatives, a task that required six weeks to complete and of course great skill for those times⁷³.



Oskar Rejlander, *The two ways of life*, 1857

Depicting a father and his two sons looking at different ways of life, it symbolises the boundaries between rural (pure) and urban (sinful) lifestyles. This photograph created controversies at its time and was characterised as indecent and inappropriate.

Other photographers of the time like Henry Peach Robinson⁷⁴ combined photography with watercolour painting in a perhaps attempt to make an artistic bridge over the two visual art media. He is also known for his pictorialistic compositions like Rejlander thus giving his images an expression of feeling rather than a depiction of facts.

The most known woman photographer of the time, Julia Margaret Cameron⁷⁵ following the same principle chose to take slightly out of focus and motion blurred images to achieve the plasticity of paintings while choosing subjects derived from themes of paintings.

The technological evolution of the late 18th century not only in photography but also in other fields which are closely related, affected the way photography was

⁷² Oscar Rejlander (1813-1875)

⁷³ Frizot et al. 1994. *History of photography*. Koeln, Koenemann Vmbh. Edited by Michel Frizot.

⁷⁴ Henry Peach Robinson (1830-1901)

⁷⁵ Julia Margaret Cameron (1815-1879)

perceived by the public, and also increased the number of photographs taken and of course the number of photographers.



Henry Peach Robinson, *Fading away*, 1858

Experimentation on photomechanical processes led to the invention of the halftone process which allowed photographs to be directly reproduced in publications such as periodicals and newspapers. As a result the visual information provided to the general public increased to an unprecedented degree. Long columns of descriptive texts were now substituted by photographs using the halftone process instead of the time-consuming engravings and line drawings that appeared occasionally on a page.

This was the kick start for photojournalism to flourish but also for commercial photography to take the place of sketches and other means of manual depictions. In the photography section itself the introduction of Kodak camera by George Eastman⁷⁶ (1888) brought yet another revolution in the medium. Thousands of amateurs were now able to take pictures and to have them developed thus avoiding hours of processing in household rooms turned into darkrooms. The company slogan “You press the button, we do the rest” enticed people to carry a relatively small camera and take lots of spontaneous photographs without being concerned with technical details. The introduction of film instead of glass plates also allowed the size and weight of cameras to drop significantly and make them suitable even for children. These developments had of course an impact also on professional photography as

⁷⁶ George Eastman (1854-1932)

portraitists were no longer essential for taking a simple snapshot. Thus more amateurs that had no previous experience in art became active in photography as they had the chance to get involved with the medium in a less costly and time consuming manner.

The mass production of photographs by more and more people in the beginning of the 20th century could not be overlooked by art photographers. In 1902 Alfred Stieglitz⁷⁷ launched the Photo Secession in an effort to discriminate pictorialist and abstract photographers from all other kinds of photography with exhibitions in New York and London⁷⁸.



Alfred Stieglitz, *The Steerage*, 1907

He also published a magazine called *Camera Work* where he promoted the new art photography as he called it, but also enlarged the scope of the periodical to include other arts and art theory. Photo Secession had also its own “home” in Stieglitz’s former studio at 291 Fifth Avenue, which became internationally known as “Gallery 291”. Artworks of painters were also shown at that gallery including Auguste Rodin, Henri Matisse, Pablo Picasso, Paul Cezanne and others. This was a strategic move of Stieglitz to shift photography to the levels of fine art next to the traditional

⁷⁷ Alfred Stieglitz (1864-1946)

⁷⁸ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.

arts. Much criticism evolved from this, mainly accusing the pictorialist photographers that they were “mixing deliberately technical devices of painting with photography thus creating an injustice”⁷⁹. The Photo Secessionists on the other hand advocated that their self expression was soul preserving in a world of mass production and mass taste. Apart from Stieglitz, also well known photo secessionists are Edward Steichen⁸⁰, Clarence White⁸¹, Gertrude Käsebier⁸², Frank Eugene⁸³, Alvin Coburn⁸⁴ and others. The Camera Work was published until June 1917, where at the last issue photographs of Paul Strand⁸⁵ were shown.



Edward Steichen, Flatiron, 1905

Paul Strand did not come into photography through art but through social concern, being a student of Lewis Hine at the New York Ethical Culture School. Hine is well known for his pictures of under-aged factory workers, pictures that forced the formulation of legislation to control industrial hiring practices. Paul Strand’s pictures made street photography popular using photography in a “brutally straightforward way” in Stieglitz’s word.

⁷⁹ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.

⁸⁰ Edward Steichen (1879-1973)

⁸¹ Clarence White (1871-1925)

⁸² Gertrude Käsebier (1852-1934)

⁸³ Frank Eugene (1865-1936)

⁸⁴ Alvin Langdon Coburn (1882-1966)

⁸⁵ Paul Strand (1890-1976)



Paul Strand, *Blind*, 1916

After WWI the mass press media were growing at a rapid pace. More and more newspapers and magazines were published that made photojournalism more popular. Social concern, even though the oversupply of pictures of poor people created a “compassion fatigue”, did not lose ground. But apart from photojournalism art photography was not left behind in the Photo Secession’s movement of pictorialism and abstract photography. Artistic genres such as surrealism, dada and futurism were also expressed through the photographic medium especially in Europe. The Russian revolution had a deep impact on artists as the new regime encouraged revolutionary artists experimenting with cubism and futurism. In that period photomontage was revisited after over 50 to 60 years since Rejlander. However these photographic experiments originated by German and Soviet experimental artists had completely different social roots than their Victorian-era predecessors. Famous photographers of this era are Alexander Rodschenko⁸⁶, Andre Kertesz⁸⁷, Lazlo Moholy Nagy⁸⁸, Man Ray⁸⁹ and others⁹⁰.

However these artistic oeuvres did not make a great impression when they crossed the Atlantic.

⁸⁶ Alexander Rodschenko (1891-1956)

⁸⁷ André Kertész (1894-1985)

⁸⁸ Lazlo Moholy Nagy (1805-1946)

⁸⁹ Man Ray (1890-1976)

⁹⁰ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.



Alexander Rodtschenko, Stairs, 1930

In the mists of Pictorialism in the late 1920s a group of photographers issued a manifesto which was called “Group f64” advocating that photography should remain independent of ideological conventions of art (such as pictorialism) and it should develop within the actualities and limitations of the photographic medium. The group’s name derived from the use of the smallest aperture level possible (f64) that provided the greatest amount of depth of field, thus allowing both the foreground and background of the image to remain clear (in focus).



Ansel Adams, Tetons River, 1942

Ansel Adams⁹¹ and Edward Weston⁹² are probably the best known members of the group. Apart from f64 the social circumstances in the United States brought a new wave of social concern pictures. The Depression era following the economic crisis of 1929 was depicted with striking images in the 30s by Dorothea Lange⁹³ and Walker Evans⁹⁴. In Europe the 30s are also suitable for social photojournalism with Brassai⁹⁵, August Sander⁹⁶ and of course Henri Cartier Bresson⁹⁷, who set the foundation of further interpretation of a street photograph with the introduction of the “decisive moment” of taking the picture. August Sander comes as a great influence to many later artists like Becher and Gursky with his direct approach and photographic objectivity using no awkward angles or experimenting with photographic materials. His major project was the compilation of portraits from different occupational types starting from farmers and industrial workers to professions, artists and ending with the unemployed and disabled. Sander’s work is considered an international reference point of conceptual artists.



August Sander, Hod carrier, 1929

⁹¹ Ansel Adams (1902-1984)

⁹² Edward Weston (1886-1958)

⁹³ Dorothea Lange (1895-1965)

⁹⁴ Walker Evans (1903-1975)

⁹⁵ Brassai (Gyula Halasz) (1899-1984)

⁹⁶ August Sander (1876-1964)

⁹⁷ Henri Cartier Bresson (1908-2004)

During the 40s however, a tendency to shift back to abstraction was once more evident especially in the United States. In general abstract photography, although not a major trend in photography as a whole, returned repeatedly after the Second World War challenging the general idea that photography should record the reality. Artists of this period that referred back to Stieglitz and Rejlander as their references are Aaron Siskind⁹⁸, Minor White⁹⁹, Lotte Jacobi¹⁰⁰ and Jerry Uelsmann¹⁰¹.

Minor White, like Stieglitz, insisted that photography could be something more than the literal depiction of optical reality and preferred to work in series of abstract pictures arranged so as to depict poetic meanings. If he had lived in the end of the 19th century he would probably be a pictorialist, but at this period one could say he is the aesthetic combination of pictorialism (Stieglitz), pure photography (f64) and abstract photography (His teachings across the United States allowed him to inspire young photographers to have a personal and spiritual insight in their work. In 1952 he became editor of art photography magazine Aperture which he founded together with Ansel Adams, Dorothea Lange and others.



Minor White, Metal Ornament, 1957

Jerry Uelsmann was also a student of Minor White and his superb combination printing technique allowed him to create alternative worlds where nature

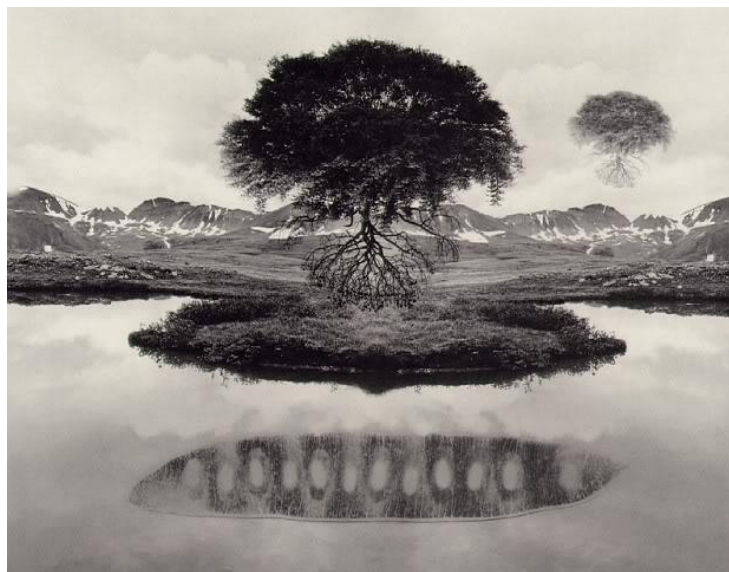
⁹⁸ Aaron Siskind (1903-1991)

⁹⁹ Minor White (1908-1976)

¹⁰⁰ Lotte Jacobi (1896-1990)

¹⁰¹ Jerry Uelsmann (1934)

operates in a different manner than in reality. Surrealism in photography had lost its feeling of anger over political circumstances and was now more of a psychological inquiry and imagination. Uelsmann made also direct references to the 19th century pioneers of photography. One of his most well known pictures showing a floating tree over a small piece of land and a lake is an image made in 1969. Today our visual experience is much more saturated by images like this, as the extensive use of sophisticated software allows us to create such images and even more complex in a much easier way and with practically endless possibilities. However at that time this was a product of great skills, notable labour time and of course artistic creativity. The fact that these factors are taken into consideration by a large portion of viewers and critics today makes it difficult to compare the value of images of more or less similar aesthetics (abstract for instance) especially when they are made at different times and with different technological methods. The conversation over value is literally endless but the most important aspect perhaps is to comprehend its multidimensional nature.



Jerry Uelsmann, Untitled, 1969

Street photography acquired a new dimension in the post war period. Art photographers also started to practice street photography trying to express their inner feelings instead of just depicting the street's reality. In this period famous and influential artists appeared such as Lee Friedlander¹⁰², Garry Winogrand¹⁰³,

¹⁰² Lee Friedlander (1934)

¹⁰³ Garry Winogrand (1928-1984)

Weegee¹⁰⁴ (Arthur Fellig) and Diane Arbus¹⁰⁵. Arbus's pictures of children, many of them from the streets of New York, are distinctive as she reveals them as "little versions of mean-spirited adults"¹⁰⁶. At first glance most of her pictures seem like everyday children snapshots but a closer look starts to give out all small details that result to a completely different perception of the picture. Arbus is yet another conceptual artist, who has influenced greatly the generations of artists afterwards, among them Rineke Dijkstra included in the sample of the analysis.

In the 60s and 70s the use of colour photography was becoming more and more often. Again commercial photography would be the first to embrace the new trend but art photography was soon to follow.

Form and lighting were not enough to express artistic needs and "colour challenged the photographer's ability to resist its simple prettiness and devious nullification of form" according to John Szarkowski, director of the Photography department at New York's Museum of Modern Art from 1962 to 1991, successor of Edward Steichen.



Diane Arbus, Child with toy hand grenade, 1962

His contribution to the reinstating fine art photography in New York and thus launching the career of many art photographers is beyond any doubt. This phrase on colour comes from a book he wrote in 1973 "How to look on photographs" and uses as an example the work of William Eggleston¹⁰⁷ who is one of Andreas Gursky's major influences concerning the use of colours.

¹⁰⁴ Weegee (Arthur Fellig) (1899-1968)

¹⁰⁵ Diane Arbus (1923-1971)

¹⁰⁶ Marien, M.W., 1997. *Photography and its critics*. Cambridge, UK. Cambridge University Press.

¹⁰⁷ William Eggleston (1939)



William Eggleston, Greenwood Mississippi, 1970

At this point this brief representation of photographic history will be over as it starts to overlap with work which is considered contemporary and therefore falls to the genre of artists which are chosen for the analysis of this study.

Even though the history of photography is less than 200 years old, it cannot be presented adequately in a small chapter. The purpose of this chapter was to give a slight idea of the photographic timeline with some important points of reference and with the assist of visual examples. It is probably unfair to judge an artist aesthetically by a single image, but in texts concerning photography it is always helpful to have an image present. Important photographers have been left out, or mentioned but not analysed enough due to certain constraints. The major constraint is the sample, the description of which will follow in the methodology chapter. The 12 artists chosen are a fragment of the population of artists active in the last 30 years both recognised and mentioned by art photography books but also others who work in obscurity. The purpose of this study is not to judge whether these 12 artists are a good fit sample to describe the population of art photographers aesthetically, but they are certainly recognised after decades of work for some reason. The expert opinion is the one that will define in the end of the day, who is the one to be recognised or not and in a world of millions of images, thousands of photographers and artists that is a difficult task.

3.5 Photography museums

The term “photography museum” was used from a very early stage in photographic history when some of the first studio owners and also pioneering independent photographers used it to describe their establishments: for instance, the

Macaire brothers¹⁰⁸ in Paris at the end of the 1840s when they proposed the creation of a department that would collect everything that the photographic medium would have to offer. Hermann Krone¹⁰⁹ in Dresden a few years later for the collection of plates he assembled to demonstrate his techniques. He created the “Historical Didactic Museum of Photography” an exhibition of techniques with illustrations with the purpose to make people more accustomed to the medium¹¹⁰. At this time very few public institutions were interested in photography. The earliest collections owed their creation to private initiatives with the formation of photographic associations like for example the London Photographic Society, later the Royal Photographic Society (RPS), and the Société Française de Photographie). An exception showing government interest on the medium, was the South Kensington (later Victoria & Albert) Museum, whose director Henry Cole from 1852 bought and commissioned photographs for both teaching and documentary purposes. It was also the establishment that hosted in 1854, the first photographic exhibition to be held in a museum with royal patronage¹¹¹. However this initiative was perhaps the only one occurring at that time. Photography was to be exhibited for documentation or scientific purposes because of its technological advantages. It was not until the 1930s, as described earlier during the short historical summary, that photography modestly began to gain access to galleries and also a museum as an autonomous artistic medium. Alfred Stieglitz gave several hundred photographs to the Department of Prints of the New York Metropolitan Museum in 1928 and 1933. The year 1927 saw the opening of the Kodak Museum at Harrow, near London. The same year, the Musée des Arts et Métiers in Paris dedicated one of its galleries to a strictly technical survey of photography and cinematography. In 1935, the San Francisco Museum of Art acquired its first camera images. However, it was the Museum of Modern Art (MoMA) New York, which created the first photography department in an art museum, taking place in 1940 with the initiative of Alfred Barr and Beaumont Newhall. The next important step in the establishment of photography in museums was the transformation of the house of the late George Eastman, founder of Kodak, into a museum of the history of photography in 1949. Its collection was the first of this scale internationally and still one of the most important. In Essen, Germany, Otto Steinert created a photography department at the Folkwang Museum in 1959.

¹⁰⁸ Louis-Cyrus Macaire and Jean-Victor Macaire-Warnod, known as "les frères Macaire" (French, 1807–1871; French, 1812–after 1886).

¹⁰⁹ Hermann Krone (September 14, 1827 – September 17, 1916)

¹¹⁰ Boom, M. Rooseboom, H. 1996. *A New Art: Photography in the 19th Century*. The Photo Collection of the Rijksmuseum, Amsterdam.

¹¹¹ Haworth-Booth, M. 2004. *Photography: An Independent Art*. Photographs from the Victoria & Albert Museum 1839-1996. V&A Publications, London.

Thanks to the initiative of an amateur photographer and collector, André Fage, France's first photographic museum was founded at Bièvres. The general interest in the history of photography and its inventors prompted other local initiatives: in 1972, for example, the Musée Niépce opened at Chalon-sur-Saône, organized initially around the Niépce archives. Three years later, Henry Fox Talbot's home at Lacock Abbey opened to the public.

Today, institutions dedicated to photography are both numerous and very varied in structure, approach, and size. They can be divided into four categories. One category is that of the museum specifically dedicated to the history of photography (and sometimes also cinematography) which cover technical, artistic, sociological, and cultural aspects from the invention and before to the present. Primary example is the George Eastman House mentioned above but also the National Museum for Photography, Film, and Television in Bradford (founded in 1983), which today houses numerous British collections of images and equipment. In France there is the Musée Niépce dealing with one of the most important collaborators in the birth of the photographic medium. In Belgium museums of photography can be found in Antwerp (founded in 1965) and Charleroi (1987). Notable are also the Museum of Hungarian Photography in Kecskemét (1990), the Netherlands Fotomuseum in Rotterdam¹¹² (2003) and the Museum of Photography in Thessaloniki¹¹³ (1987).

A second category is more specifically focused on photographic technology, dealing often with collections of photographic cameras like the Swiss Camera Museum at Vevey (1971), the camera collection of the National Museum of Technology, Prague (reorganized 1983), and the Canon Camera Museum in Tokyo.

A third category is the one of combined visual arts such as a museum of paintings and sculptures incorporating photography. Most large North American museums (the Metropolitan Museum, Art Institute of Chicago, Boston Museum of Fine Arts, National Gallery in Washington, DC, J. Paul Getty Museum, San Francisco Museum of Art, Houston Museum of Fine Arts, Amon Carter Museum, Fort Worth, etc.) had either created photographic departments by the end of the 20th century or at least become seriously active in the field. This idea also caught on in Europe: for example, in Britain (the Victoria & Albert Museum, National Portrait Gallery, and National Galleries of Scotland), Paris (the Musée d'Orsay, Musée National d'Art

¹¹² <http://www.nederlandsfotomuseum.nl/> (Consulted on 7th July 2009)

¹¹³ <http://www.thmphoto.gr/> (Consulted on 7th July 2009)

Moderne-Centre Pompidou), Vienna (the Albertina) and the Netherlands (Rijksmuseum). Outstanding curators such as John Szarkowski (MoMA), Weston Naef (Getty), and Mark Haworth-Booth (Victoria & Albert) have been important in integrating photography into the wider museum scene. Many museums of photography are now affiliated to museums of fine or contemporary art: e.g. the Agfa Photo-Historama in Cologne linked to the Ludwig Museum, the Hague Museum of Photography built attached to the Gemeentemuseum Den Haag, the Fotografiske Museet in Stockholm, close to the Moderna Museet; and the Canadian Museum of Contemporary Photography affiliated to the Ottawa Gallery of Fine Art¹¹⁴.

A fourth less common category is that of the museum or foundation created around a particular photographer or establishment. Notable, apart from Lacock Abbey (Henry Fox Talbot), are the Alinari Foundation in Florence; the Primoli Foundation in Rome; and the Cartier-Bresson Foundation in Paris (2003). Finally, many non-photographic museums and other institutions hold extremely important photographic collections: in London alone, for example, the British Library, Imperial War Museum, National Maritime Museum, Royal Geographical Society, and numerous others.

The development of the Internet has brought with it the creation of 'virtual' photographic museums - e.g. the American Museum of Photography¹¹⁵ - almost as varied in size and content as their bricks-and-mortar counterparts.

These institutions have nowadays a twofold role depending on their specialisation described above. First they provide historical information for the course of the photographic medium in order to show the difficulties of earlier techniques but also the accomplishments of the photographers of the past. Second museums are prestigious exhibition centres for contemporary artists, which could influence a dealer or an expert in the price estimation phase of the artworks. Museums have also a greater opportunity to bring new artworks to more people as they are in general more well known by the general public and their accessibility is usually greater than galleries hosting an individual exhibition from time to time.

With the conclusion of the historical summary in the present chapter, the following will present the sample of contemporary artists chosen for the analysis.

¹¹⁴ Haworth-Booth, M. 2004. *Photography: An Independent Art*. Photographs from the Victoria & Albert Museum 1839-1996. V&A Publications, London.

¹¹⁵ <http://www.photographymuseum.com/> (Consulted on 7th July 2009)

4. Data

This chapter presents the sample of 12 artists with a short biography for each one and a series of descriptive statistics on the database.

4.1 Sample overview

The data is comprised from the auction sale records of Artprice.com. The search for the artists themselves was not particularly difficult, as some maintain their personal websites but it is logical to assume that no one is willing to publicize information concerning the prices of their artworks. Only extreme cases such as 7-figure hammer prices can be found online for free. The auction houses themselves are not reluctant to disclose their records of transactions to the public, but their websites are more customer oriented, which is absolutely rational, and not data archive oriented as Artprice.com.

Artprice.com has been an apocalypse in this sense. Artwork transaction database dates as far back as the early 90s and provide adequate information concerning the size of the artwork, the year it was created, the year it was sold by the auction house and at what price, including an automatic change in euro currency. Even if the prices are not in terms of today's prices they are certainly the best possible indicator there is.

Regarding the abundance of information gathered online, some minor inconsistencies can be overlooked or dealt with in a respective manner. One of such is that there is no universal use of terms that makes it harder to include a variable of "material" in the analysis if you have no picture of the artwork itself. Each auction house has probably its own description for each photographic artwork but even there one can find several ways of defining the same thing with the possibility that crucial information is omitted. For instance one encounters while skimming through the data the use of the term "photograph" for describing the type of print, without specifying whether it is colour or black and white. Even though there is usually a preview picture alongside every transaction, in some cases it can also be misleading. If a comparison can be made, it is almost as using the term painting without defining oil or watercolour on canvas. However the frequency of those is low enough to allow the use of the type of print as a possible determinant of the artwork price.

4.2 Artists

The choice of artists for the analysis was a big question because of the great number of photographers throughout the history of photography and today. First of all I decided to include only living contemporary artists. The comparison between living and deceased artists would only add a possible bias to the analysis. Deceased artists are no longer able to produce artworks and therefore the number of their artworks becomes constant. (In rare cases unknown artworks of an artist can be discovered at later stages). Scarcity acts therefore as an important price factor that makes the comparison with contemporary artworks more difficult or even vain. One example is Richard Avedon whose control over the scarcity of his works was mentioned in Chapter 2. This of course will have a definite affect on their price which is interesting to investigate provided the appropriate data can be acquired.

The goal was also to comprise an as far as possible representative sample of the photography auction market not by choosing the most expensive artists but from a spectrum of low to high. Of course with the lack of a total photography percentage of the auction market it is difficult to identify the analogy of the sample with the population in terms of number of cases and turnover. Due to the limitations of a master thesis the gathering of more data was not feasible. The choice was made much easier with the help of a book by Michael Fried¹¹⁶ titled “Why photography matters as art as never before” where he states some names and explains why he considers their work important as well as shares his personal experience with some of them. Most of the names I chose to deal with are from this book and to those I added some names from my personal experience. The artists are Andreas Gursky, Bernd & Hilla Becher, Candida Höfer, Cindy Sherman, Hiroshi Sugimoto, James Welling, Jeff Wall, Philip Lorca DiCorcia, Rineke Dijkstra, Thomas Demand, Thomas Ruff and Thomas Struth. From those only Bernd Becher has passed away in 2007 but since he had worked together with his wife Hilla, I have decided to include them in my list. In the text following I would like to present these artists in a brief manner. Further details in descriptive statistics will follow after the presentation of all 12 artists. The sequence of the artists’ presentation is absolutely random and they are only arranged alphabetically by their first name. Some biographical information has been retrieved from the online database of the Rijksbureau voor Kunsthistorische Documentatie (RKD)¹¹⁷.

¹¹⁶ Fried, M. 2008. Why photography matters as art as never before. New Haven, USA. Yale University Press.

¹¹⁷ www.rkd.nl (Consulted on 25th June 2009)

4.2.1 Andreas Gursky

Gursky (born 1955 in Leipzig) is a German photographer who lives and works in Duesseldorf and is mostly known for his large size architecture and landscape colour photography. He studied photography in Duesseldorf at the Kunstakademie and received strong influence by his teachers Bernd and Hilla Becher. His pictures are usually from a higher vantage point and are depicting large anonymous urban spaces in great detail, such as facades at night, office lobbies, stock exchanges, the interiors of retailers etc especially since the mid 1990s. He has taken part in numerous group exhibitions around the globe as well as solo exhibitions mostly in Europe and the United States. Even though his most expensive works have been sold in London the majority of works sold is in New York by the three major auction houses i.e. Christie's, Sotheby's and Phillips De Pury and Company. He currently holds the record of the artist whose picture has fetched the highest price for a photograph. *99 Cent II Diptychon* (2001) was sold in 2007 for the dazzling price of \$3,346,456 almost €2.5 million by Sotheby's in London. It is also interesting to observe that the second, third and fourth places in the list of most expensive photographs (as by 2007) are held by masters of photography (Alfred Stieglitz and

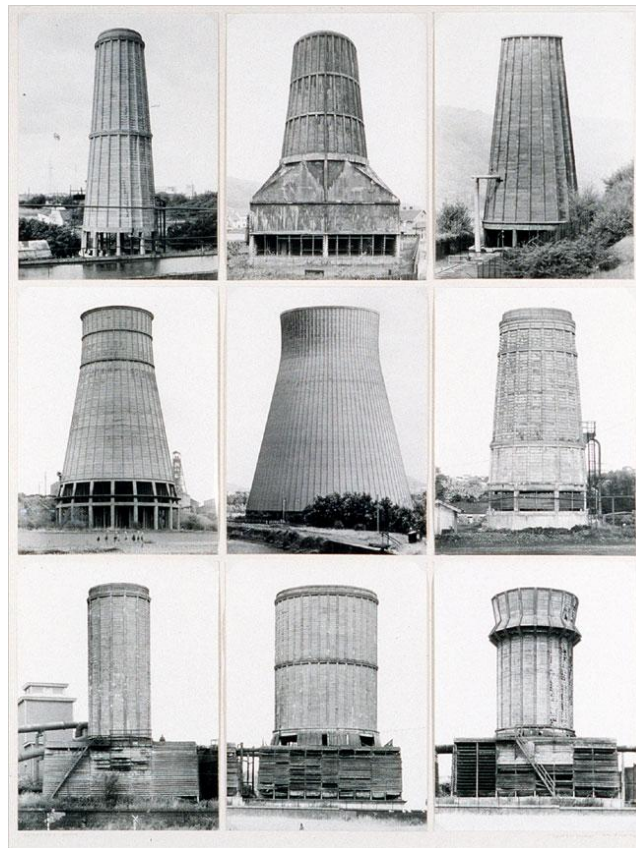


Edward Steichen) whose pictures (taken in 1904 and 1919 respectively) were also sold by Sotheby's in 2006 long after the death of the artists. However as another picture by Gursky was sold for €1.7 million in 2008 the list will probably soon consist by his name at the top positions.

Andreas Gursky
***99 Cent II Diptychon* (2001)**
206cm x 340cm
Sold for €2,277,000 in 2007.

4.2.2 Bernd & Hilla Becher

Bernd (1931 – 2007) and Hilla (1934) Becher were an artist couple mostly known for their extensive coverage of industrial buildings. They both studied at the Kunstakademie in the late 50s until the early 60s and also taught there for many years. Among their students were Andreas Gursky, Thomas Ruff, Candida Höfer and Thomas Struth who are also in the list of photographers chosen for this research. They searched for the forms and designs of disappearing industrial structures such as barns, water towers, storage silos, and warehouses taking black and white pictures from different angles but always with a straightforward and objective point of view. For this purpose they have travelled in both Europe and the United States throughout their career to discover such building sites. Their highest price at the auctions has reached by early 2009 approximately €160,000. New York is also the place where most works have been sold with London being in the second place and Cologne being close behind in third place.



Bernd and Hilla Becher's 1972 study of concrete cooling towers. A similar composition was sold for 158,763€ in 2001 by Christie's new York.

4.2.3 Candida Höfer

Candida Höfer (1944) is a German photographer born in Cologne and also a student of Bernd Becher at the Kunstakademie. Her work consists of empty interiors or social spaces in a straightforward way as her teachers and influences the Bechers. She works in colour and has gradually throughout her career tried to increase the size of her final prints by shifting from small format to medium format and lately to view cameras (large format). The highest auction price for her work so far is €78,400 from Phillips de Pury and Company in London in 2007. Once again New York is the place where the majority of works are being sold.



Candida Höfer, Palazzo Pisani Moretta, Venezia I, 120 x 143.5 cm. 2003 sold for €78,400 in 2007.

4.2.4 Cindy Sherman

Cindy Sherman (1954) is an American photographer mostly known for her conceptual self-portraits. She began studying painting at the Buffalo State College but soon realised that photography was more her medium to express her ideas. Her most well known series are the Untitled Film Stills where she takes pictures of herself in various costumes resembling actresses from B movies and film noir. She currently lives and works in New York City. She is considered as a prime example of an artist using photography as her medium rather than the opposite. Her most expensive work

was also sold there in 2007; Untitled No92 fetched €1,364,930 by Christie's. As expected from an American artist the vast majority of works (more than 80%) are sold in New York.



Cindy Sherman, Untitled No.92, 58.9cm x 120.1 cm 1981 sold for €1,364,930 in 2007.

4.2.5 Hiroshi Sugimoto

Hiroshi Sugimoto (1948) was born in Tokyo where he also studied politics and sociology before moving the United States where he retrained as an artist and received his Bachelor in Fine Arts at the Art Center College of Art and Design in Los Angeles in 1972. In 1974 he moved to New York. His work is exclusively in black and white (gelatine silver prints) consisting mostly of architecture photography, landscapes and portraits. He is perhaps the most well known Japanese photographer His most well known series of work consists of old American movie palaces and drive-ins, exposing the film for the duration of the entire film, with the film projector providing the sole lighting. He has been nominated with the Hasselblad Foundation International Award in 2001. In 2007 a compilation of three landscapes was sold for €1,217,370 by Christie's New York. This year the famous group U2 chose Sugimoto's seascape titled "Boden Sea" for the cover of their new album "No line on the Horizon" released on March 2009. The same picture had been used by sound artists Richard Chartier and Taylor Deupree for their LP Specification.Fifteen in 2006 who were inspired by the Seascape series of Sugimoto.



Hiroshi Sugimoto, Aegean Sea, Pilion. 153cm x 182.5cm 1990. Sold for €601,065 in 2008.

4.2.6 James Welling

James Welling (1951) is an American artist self taught in photography. Based in Los Angeles, Welling has become known for his works of abstract photographs using materials like aluminium foil and velvet.



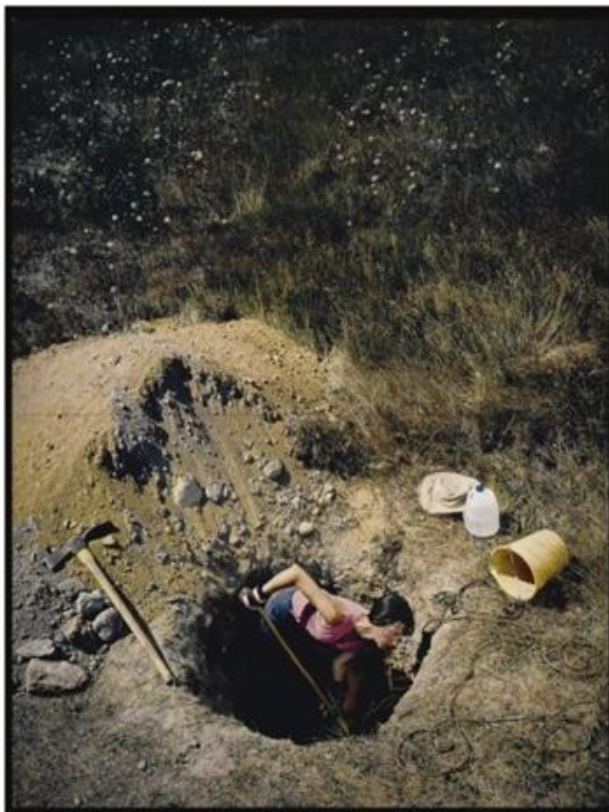
James Welling, 023, 121cm x 94.6cm 2007. Sold for €12,940 in 2008.

In the past 30 years he has extended his portfolio from black and white railway photos to colour abstract photograms (use of objects directly on light sensitive

material without exposing a negative). Though his works have not reached the enormous 6 to 7-figure amounts of other artists he is nevertheless a very important contemporary artist appreciated worldwide.

4.2.7 Jeff Wall

Jeff Wall (1946) is a Canadian photographer born in Vancouver. He studied art at the university of British Columbia where he has also been teaching for many years. He is mostly known for his large scale back-lit cibachrome transparencies (transparencies in lightboxes) and his art historical writings and essays on contemporary artists. His most expensive work, a transparency in a lightbox, reached a hammer price of €682,290 by Sotheby's in London. His reputation as a lecturer and an artist is worldwide. He was in fact offered the chair of photography in Duesseldorf Kunstakademie in 1996 as a successor of Bernd Becher who was retiring, a position he had to reject after an unusual incident occurring at the very first day to meet his new class.



*Jeff Wall, The well,
229cm x 189cm,
1989. Sold for
€682,290 in 2008.*

A former Becher student threatened him with a loaded gun and Wall was forced to resign. Becher himself was very annoyed by the passivity that the academy showed

for the incident and the chair was eventually given to a student of Becher's, Thomas Ruff.

4.2.8 Philip-Lorca diCorcia

Philip-Lorca diCorcia (1951) was born in Hartford, Connecticut. He attended the School of the Museum of Fine Arts, Boston, where he earned a Diploma in 1975 and a 5th year certificate in 1976. He received a Master degree of Fine Arts from Yale University in Photography in 1979. His work alternates between daily urban life snapshots to staged compositions.



Philip Lorca diCorcia, Mary and babe, 51cm x 61cm, 1982. Sold for €55,694 in 2000.

4.2.9 Rineke Dijkstra

Rineke Dijkstra (1959) is a Dutch photographer and video artist mostly known for her portraits. She attended the Rietveld Academie in Amsterdam from 1981 until 1986. She usually takes portraits of people in plain backgrounds indoors and outdoors and usually works in series. Her most distinctive work is "the Beaches", a series started in 1992 and was complete by 1996, which generally feature body

portraits of children or adolescents against a seascape. She became internationally appreciated when she was invited to Venice Biennale in 1997. Her works can be seen at the Stedelijk Museum Amsterdam, the Folkwang museum in Essen and the Museum of Modern Art in New York. Her highest hammer price at an auction so far is a compilation of portraits from the “Beaches” sold in 2002 for almost 400,000€ by Christie’s New York.



Rineke Dijkstra, Hilton Head Island, 1992, 190cm x 156 cm. Sold for €395,064 in 2002.

4.2.10 Thomas Demand

Thomas Demand (1964) is yet another example of contemporary German photographic artist who lives and works in Berlin. His work consists of compositions of three dimensional objects that look like real images of rooms and other spaces with often no sign of human presence. His studies included art studies at the Akademie der Bildenden Künste in Munich from 1987 to 1989, at the Kunstakademie Düsseldorf (1989-1992), at Cité des Arts in Paris in 1992, and at Goldsmiths College in London from 1993 to 1994. He entered the auction market in 2000 and his highest hammer price so far is 174,130€ in 2006 by Christie’s New York.



Thomas Demand, Raum, 1994, 183cm x 270 cm. Sold for €160,000 in 2008.

4.2.11 Thomas Ruff

Thomas Ruff (1958) is a German photographer, who also studied at the Kunstakademie Düsseldorf from 1977 until 1985. His main topics include portraits, interiors of German living quarters, nudes which are digitally manipulated, night skies and others. During his studies in Düsseldorf he developed his conceptual serial photography with room portraits of friends and acquaintances and design details of interiors from the 1950s to 1970s in Germany. He also taught the photography class at the academy from 2000 to 2005, taking the place of his former teacher Bernd Becher. He has had numerous exhibitions across Germany, in several European countries and worldwide. His debut in the auction market was in 1991 and his highest hammer price so far is 111,929€ in 2001 by Christie's London.



Thomas Ruff, Stern 02h 56, 1989, 252cm x 180 cm. Sold for €111,929 in 2001.

4.2.12 Thomas Struth

Thomas Struth (1954) is a German photographer mostly known for his interiors of buildings, portraits and photographs of empty streets with the lack of any human presence. He studied painting in the Kunstakademie Düsseldorf in the class of Gerhard Richter and photography with Bernd Becher; Struth is another example of Becher's influence such as Höfer and Gursky. His most recognised work is a series of museum interiors he started in 1989 and finished in 2002. He has had exhibitions in many countries around the globe i.e. Munich, Cologne, Brussels, Amsterdam, Washington and New York which gave his work international acknowledgement. He currently lives and works in Düsseldorf, Germany. His top hammer price so far was in 2007 in New York where his cibachrome print of Pantheon in Rome was sold for 616,230€ by Christie's.



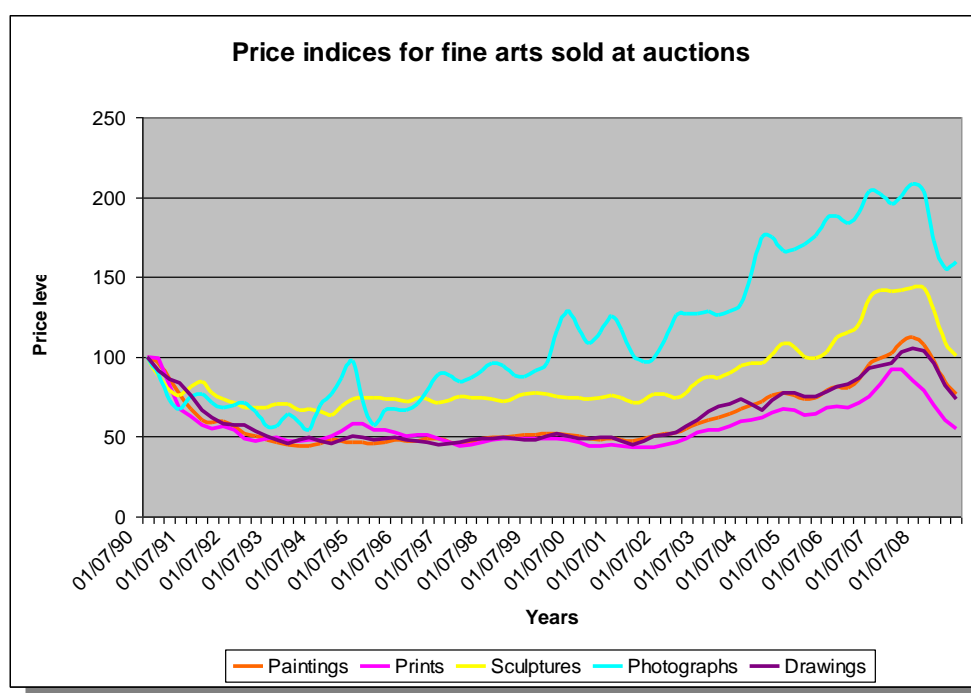
Thomas Struth, The Pantheon, Rome, 1990, 184.2cm x 238.2 cm. Sold for €616,230 in 2007.

At this point I have concluded the presentation of the photographers of my sample. The pictures illustrating the presentation are showing some of the artists' top hammer prices (in some cases the highest) and do not represent the average hammer price. In the following section of the Data chapter I will provide some descriptive statistics for the sample presented above.

4.3 Data description

4.3.1 Comparison between fine art categories

Before I begin the description of the sample data, I would like to show a very interesting graph (Graph 1) derived from a quarterly data table provided by Artprice.com. that shows the levels of prices of fine art artworks sold at auction divided per category. This graph alone could be enough to explain why photography deserves to be studied on its own. Apart from the “new market” argument the potential of its price level is prominent. Photography has managed to double its price levels in a period of 17 years (1990 – 2007), while sculpture has managed to reach 1.5 times its levels of 1990. The remaining three categories i.e. paintings, drawings and prints only managed to reach their base year levels while remaining in very low levels (half the prices of 1990) for the same period. One should also pay attention to the fluctuations of the photography line in comparison to other fine arts. Photography seems to be more sensitive to certain determinants than all the rest which appear almost constant for the decade 1993-2003. From that point on there is a general upward tendency which resulted to a peak in price levels in 2007. Perhaps this is explained by the fact that this category is new to the auction market and therefore buyers and sellers are more enthusiastic but also uncertain for long-term investments on the medium.



Graph 1. Data Source: Artprice.com

In order to test this a repeat sales study would be useful in the same manner as similar studies have been for paintings. In the case of photographs however a more detailed database is needed for such a research such as the Reitlinger database for paintings.

The impact of the financial crisis on auction prices is apparent. All categories show a downward slope in 2008. The time series stops in April 2009 and therefore is not noted on the axis as a whole year, but surprisingly there is an upward tendency just for photography in the beginning of 2009. Although the data is not yet sufficient to show a clear positive tendency for the whole year, this positive sign, if verified, brings up several questions yet to be answered with future data analyses.

In general we could say that all categories follow a similar pattern. Paintings and drawings follow an almost identical path in the course of 20 years. Prints are the ones that seem to be the most negatively affected always in comparison to the base year of 1990 since in 2008 alone they reach the price levels of 2002 when the apparent rise began. The same is the case for drawings and paintings; sculpture and photography on the other hand have managed to stay in higher levels despite of the sudden drop. As the financial crisis is still at large during the writing of this thesis, there is no safe prediction as to where price levels can be at the next turning point.

4.3.2 Descriptive statistics

In order for the reader to have a better understanding of the data, first there will be some comments on the frequency histograms on place of sale and auction houses, which can be found in Appendix 1. This will help describe the characteristics of the market for auctions in photography with the indication of market shares concerning cases (number of artworks sold).

Then there will be comments on the diagrams of Appendix 2 showing the tendencies of the average hammer prices and average prices per cm². By studying those, the goal will be to identify possible patterns among the artists in the period of 8 years which is examined. If such patterns apply to the diagrams it would mean that the price for auctioned photographs depends on factors which cannot be overcome/influenced by the reputation of the artist. These factors could be a general tendency of the art market to sell higher or lower depending on the market situation of the specific period (bull / bear market). Increasing reputation, higher willingness to pay from the demand side and the overall confidence on photography as an art investment are all possible explanations for these phenomena.

The descriptive commentary will continue with Table 3 which summarizes the whole dataset used in this study in matters of minimum/maximum price values per artist, average prices and their standard deviations. This will be followed by a table of the segmentation of prices (Showing the percentage of artworks at different price levels). Afterwards these prices are summed into a chart to show the actual turnover per auction house as a supplementary indication of market share as described in the first section.

Photographer	Frequency	% Freq.	Turnover	% Turnover
Andreas Gursky	280	7.4	35,072,907	26.2
Bernd Hilla Becher	251	6.6	5,102,994	3.8
Candida Höfer	317	8.3	2,067,492	1.5
Cindy Sherman	798	21.0	28,107,240	21
Hiroshi Sugimoto	642	16.9	21,150,812	15.8
James Welling	65	1.7	201,730	0.2
Jeff Wall	43	1.1	3,842,187	2.9
Philip Lorca DiCorcia	163	4.3	1,973,313	1.5
Rineke Dijkstra	126	3.3	2,639,218	2
Thomas Demand	101	2.7	4,601,844	3.4
Thomas Ruff	630	16.6	12,571,644	9.4
Thomas Struth	386	10.2	16,789,623	12.5
Total	3802	100	134,121,004	100

Table 1: Frequencies of cases and turnover per artist

The above table shows the number of cases and the amount of turnover per artist. The total of 3802 cases includes auctioned artworks of all 12 artists from 1989 until March 2009 respectively. This table is to show the fact that the number of cases and the amount of turnover have no definite interrelation whatsoever. Gursky and Becher have almost the same number of cases (280 to 251) but Gursky has a turnover of seven times the one of Becher. Ruff and Sugimoto have also approximately the same number of cases with the latter having a bit less than double the turnover of Ruff. Demand at another example shows more than double the turnover than Höfer while having one third of total number of cases. Another fact that makes a great impression is that for these 12 artists an auction sale course of 20 years (without everybody participating for all 20 years) there is a total turnover of 134 million euro. This amount is a good enough indicator of the total revenue that art photography brings to auction houses. The annual revenues of the auction houses for all kinds of fine art reached a dazzling amount of 9.2 billion dollars (approximately

7 billion €) in 2007, which is also considered the peak after 7 years of consecutive price inflations on auction transactions.

Year	N	Sum
1989	2	7,184
1990	12	164,457
1991	22	188,711
1992	46	397,007
1993	46	451,301
1994	47	373,562
1995	42	312,786
1996	79	621,924
1997	61	794,658
1998	94	1,791,477
1999	119	3,051,065
2000	277	8,283,042
2001	283	9,282,327
2002	234	8,729,371
2003	260	7,389,148
2004	353	10,149,430
2005	399	12,952,843
2006	559	21,809,840
2007	436	26,039,598
2008	391	19,807,552
2009*	40	1,523,721
	3802	134,121,004

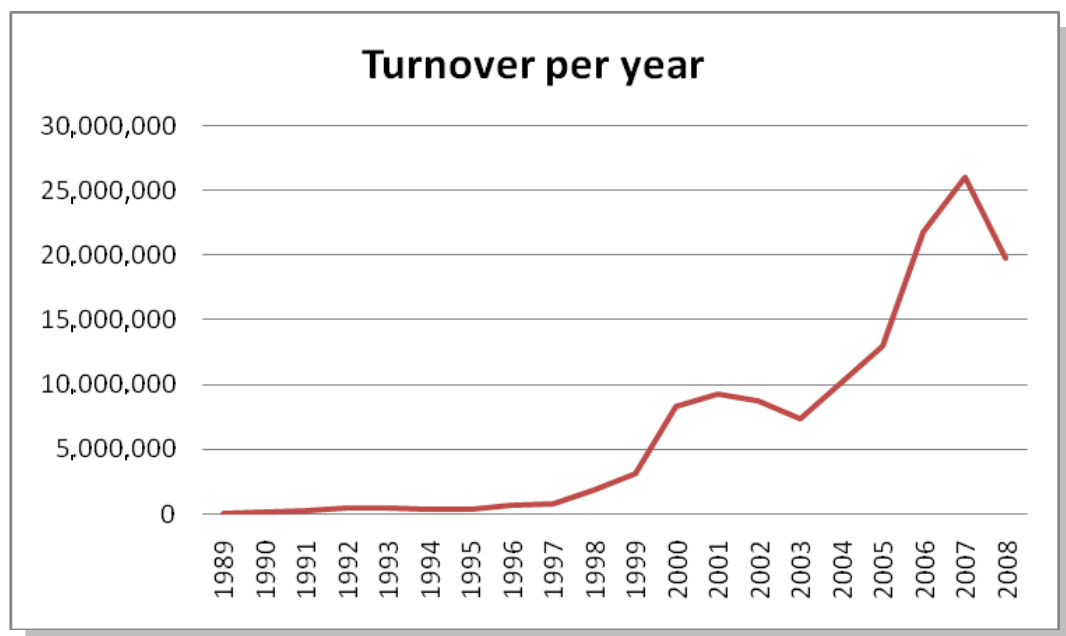
Unfortunately there was no chance to acquire data concerning all transactions on art photography for auction houses, however with the use of the next table (Table 2), which gives the amount of turnover per year for all 12 artists, this comparison is more plausible. In this case the artists of the sample sold for a total of 26,039,598 € in 2007 which of course compared to the total auction fine art revenue of 7 billion € it reaches approximately 0.5%. This comes as no surprise when one considers the price levels of Impressionist paintings like a Monet painting that sold for approximately 22.3 million € in the same year¹¹⁸. Another interesting assumption one can draw from comparing Table 2 to the annual auction sales turnover is the fact that they both follow a very similar pattern. Starting from 1997 at almost 800,000€ there is a gradual increase of turnover until 2000 to 2001 where amounts have reached 10 times those of 1997 at more than 9 million €, then there is a slight downfall until 2003 (7.3 million €) and from 2004 until 2007 there is a significant increase that almost triples the amount of turnover of 2003. In the grand scheme of things the fine art auction sales showed a small increase until 2000 then a fall and stagnation until 2003 and from 2004 until 2006 an increase which resulted to doubling the 2003 amount (around 2 billion €) and reaching 7 billion in 2007 2008 is considered by Artprice a correction year and this is probably also the reason why there is a

Table2: Turnover per year

*until March

¹¹⁸ Artprice (2008), 2007 Art market trends, Artprice.com.

downfall in the turnover of the sample artists. All in all it is plausible to say that there is a general tendency for contemporary photography to follow the same pattern as the entire fine art auction market. The number of cases also follows a similar course as the turnover, something which was not the case with the artists. Again 2007 even though it has fewer transactions than the previous year the total turnover rose by approximately 4.2 million €. As the data for 2009 is at this point incomplete they are not taken into account in the following graph (Graph 2) which depicts Table 2. By comparing Graph 1 and Graph 2 it is easily noticeable that both lines follow approximately the same pattern. Even though the first graph shows many fluctuations, around 2000 and 2001 there is an increase with a slight decline over the next two years and afterwards a steep rise with a peak in 2007 and the correction of 2008 leading to a drop. This also contributes to the fact that the sample chosen for this study is a representative sample.



Graph 2

The following table (Table 3), summarises all basic information concerning hammer prices of all artists. The N represents the number of total cases per artist i.e. the number of hammered down artworks, which are considered sold artworks¹¹⁹.

¹¹⁹ Auction house theory (Aschenfelder, 1989) suggests that not all hammered objects are necessarily sold. Because of lack of information for the fate of each particular artwork it is assumed that hammered artworks are normally sold.

Photographer	Categories	N	Minimum	Maximum	Mean	Std. Deviation
Andreas Gursky	Price sold in euros	280	1,982	2,277,000	125,260	245,022
	Price per cm2		.268	571.83	7.08	34.28
Bernd Hilla Becher	Price sold in euros	251	335	158,763	20,331	26,524
	Price per cm2		.216	92.80	14.17	18.48
Candida Höfer	Price sold in euros	317	237	78,400	6,522	9,753
	Price per cm2		.162	17.09	1.60	1.55
Cindy Sherman	Price sold in euros	798	357	1,364,930	35,222	78,068
	Price per cm2		.038	658.87	17.88	44.52
Hiroshi Sugimoto	Price sold in euros	642	1,024	1,217,370	32,945	83,184
	Price per cm2		.323	69.58	7.04	5.84
James Welling	Price sold in euros	65	246	12,940	3,104	2,737
	Price per cm2		.187	31.43	3.29	5.52
Jeff Wall	Price sold in euros	43	632	682,290	89,353	136,518
	Price per cm2		.488	38.54	7.18	7.81
Philip Lorca DiCorcia	Price sold in euros	163	306	55,694	12,106	9,657
	Price per cm2		.159	25.92	2.44	3.17
Rineke Dijkstra	Price sold in euros	126	628	395,064	20,946	39,783
	Price per cm2		.301	35.42	7.95	8.34
Thomas Demand	Price sold in euros	101	633	174,130	45,563	42,705
	Price per cm2		.255	30.70	2.90	3.58
Thomas Ruff	Price sold in euros	630	255	111,929	19,955	24,279
	Price per cm2		.025	28.27	2.05	2.49
Thomas Struth	Price sold in euros	386	204	616,230	43,496	82,548
	Price per cm2		.164	54.91	2.81	3.69

Table 3

The minimum and maximum figures show the area of hammer prices that each artist has had until March 2009 starting from a specific year when their first auction sale was recorded. These years start from approximately 1989 until 1999 and are different for every artist and for that reason they are not included in the diagrams which are presented in Appendix 2. These first years (until 1999) also include very few cases for most artists in comparison to the eight-year period which is represented in the mean price diagrams (See appendix 2) and therefore do not influence the mean price and the standard deviation significantly. However, as the reputation of the artists grows through time, the estimates of experts reach greater levels and collectors become more and more interested in works of particular artists

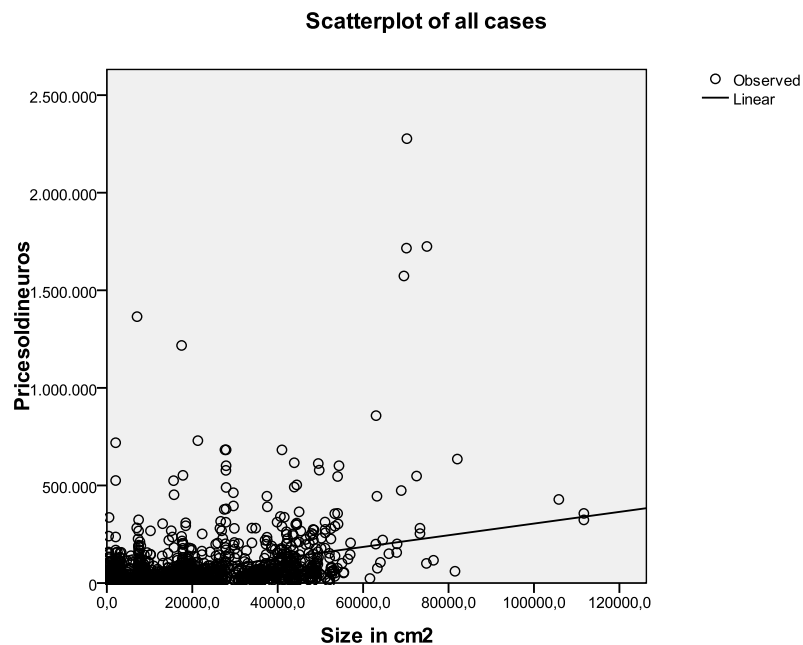
like the ones of this sample, the need of a time scaled analysis of these figures becomes more evident. In other words this table gives out the mean of means by year and therefore does not reflect the true image of today. This can also be observed when for instance the standard deviation of Andreas Gursky's artwork prices (245,022) added to the mean (125,260) does not even reach half the level of the maximum case. It does show however that the high 7-figure cases are quite few in comparison to the total of 280 cases. These are called outliers in the statistics language and can usually alter the statistical results. They are also the ones that draw everyone's attention when they are published and form the highest records (like the case of Gursky). With the exception of two artists (Wall, Welling) the number of cases for each artist is high enough to allow the arithmetic mean to be more trustworthy or to put it in a statistical manner, to describe the distribution of cases better.

The year-assorted tables are shown in Appendix 3. In addition with the diagrams they give out the tendency of the mean price per year for each artist. What is interesting to observe is how a group of artists seems to follow a similar pattern while others follow their own. For instance the period between 2003 to 2005 shows quite low scores in the mean prices than for instance 2007. This applies to almost everybody with a few exceptions. This is also one of the reasons why a group of 12 artists was chosen. This way we can infer with greater confidence that market trends and other external factors do play a role in determining the price of auctioneered items. Auction estimates are also based on the presumption that certain buyers (collectors) show an inelastic demand for particular artists (or items). This of course does not mean that buyers do not behave in an economic manner thus creating these fluctuations in prices over time. The extent however of this influence is really hard to measure and would probably need a demand side research to study the behaviour of collectors, dealers and other buyers in a period of years with different market possibilities (bull market, bear market). For instance the period of eight years studied here does not take into consideration the financial crisis that started in 2008 but probably gives some hints of what is going to come next. A research study including the financial crisis' years in the middle of the time series could quite possibly present the impact (if there is any) on the auction sales. Already there is a general tendency for a downfall. 2008 was according to Artprice¹²⁰ a correction year and they also confirm the above assumption that the auction market cannot help but follow the financial crisis with lower turnovers in 2009 at least. At this point it is

¹²⁰ Artprice 2009. Art Market Trends 2008.

difficult to make an estimate for the year's revenue with just three months of data especially when important auctions take place in June and November. This remains to be seen.

The following scatterplot (SC0) shows the spreading of all 3802 cases with size in cm² on the horizontal axis and the price in euro on the vertical. From this scatterplot we can see that the relation (regression line) between size and price is generally positive but there are also outliers created by other factors (reputation of artist, scarcity) that allow a small print of 13 by 18 cm or even less to fetch an unusually high price. On the other hand there are cases of large prints (or installations of 3 or more prints on one panel that make the total number of cm² larger) that do not sell at a greater price than a single print.



SC0

With the exception however of few cases that can be counted manually using this scatterplot, the vast majority of cases appears to show a low positive relation of size and price at the below 500,000 euro area. It is also interesting to observe how cases that belong to same size level (around 30,000cm²) are priced from a few hundred Euros until approximately 750,000€.

This general view of scattered cases can be examined more thoroughly with the use of the Scatterplots per artist which can be found in Appendix 4. These show in general that some artists appear to be more size-dependent and therefore the

tendency line has different slopes (comparisons between artists should be made with same scales of measurement on both axes like Struth and Wall for instance).

The table of segmentations gives an additional view on the general price levels of the artists and how far the majority of artworks can be from the top hammer prices. The general impression is that some artworks achieve large prices but they appear to be only a 10% of the cases for each artist. A good example of this disparity is Sugimoto where his top price has reached an amazing 7-digit number while 90% of his artworks sold are below 38,000 €. The only one who shows the lowest disparity is Demand with just seventy thousand € difference. He is also the youngest artist of the sample which does not exclude the possibility that one of his works will achieve a similar amount like the ones of Dijkstra, Struth or even more.

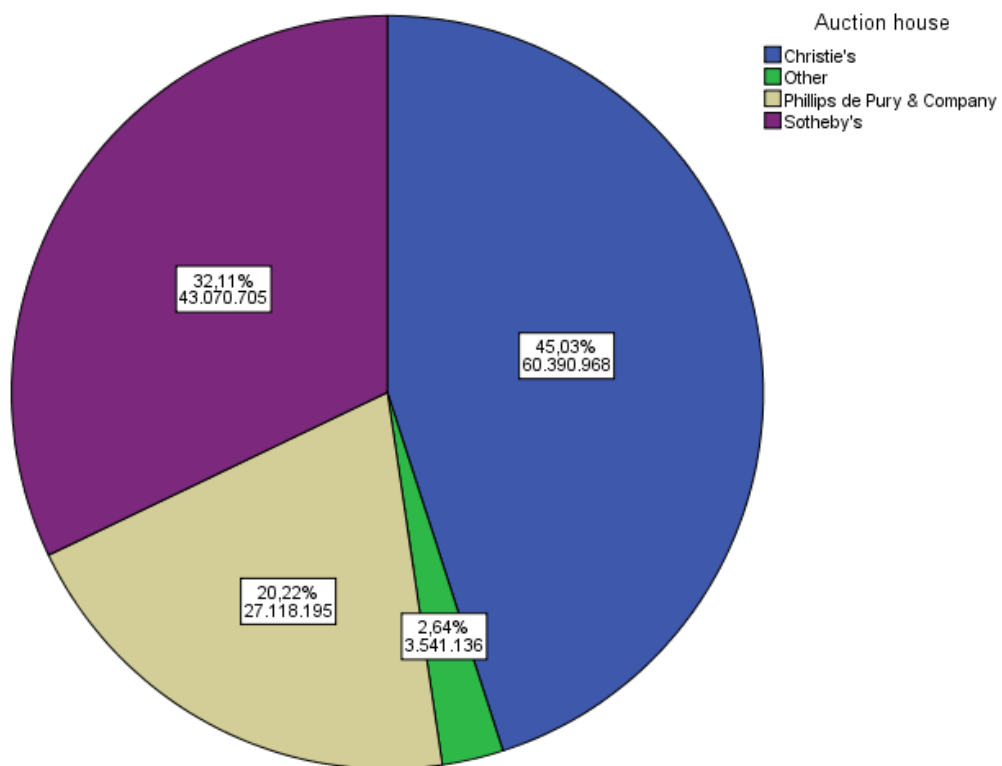
Segmentation of hammer prices by price segments (EUR) 1997 – 2008*	Gursky	Becher	Höfer	Sherman	Sugimoto	DiCorcia	Dijkstra	Ruff	Demand	Struth
Top hammer price	2,277,000	158,763	78,400	1,364,930	1,217,370	55,694	395,064	126,038	174,130	616,230
90 % of hammer prices are under	262,752	40,797	14,820	106,315	38,376	23,699	39,170	55,215	107,341	122,137
80 % of hammer prices are under	178,636	22,107	8,525	55,125	27,668	18,544	25,523	36,117	85,052	61,928
70 % of hammer prices are under	114,305	11,500	6,144	38,205	22,001	13,608	19,500	23,229	62,130	30,168
60 % of hammer prices are under	66,737	7,947	4,500	25,439	18,400	11,297	14,370	15,068	49,569	15,172
50 % of hammer prices are under	42,310	4,747	3,456	15,084	14,871	8,953	12,189	4,643	41,591	8,659
40 % of hammer prices are under	21,855	2,552	2,600	6,000	12,579	7,700	9,360	2,400	27,808	5,803
30 % of hammer prices are under	11,248	1,329	1,900	3,033	9,655	6,588	6,489	1,800	2,863	4,387
20 % of hammer prices are under	7,872	700	1,125	1,718	6,677	5,327	4,602	1,380	1,600	3,466
10 % of hammer prices are under	4,953	300	767	1,022	3,254	3,754	1,919	1,001	1,000	2,050

Table 4

* Unfortunately this information was not available for all 12 artists, therefore Wall and Welling are not included in this table.

Artprice.com 2009

The following pie charts show the percentage and total turnover figures per auction house and per place of sale for all cases. The total number of auction houses which were analysed from the data is 70. The frequency table of all cases per auction house (Appendix 1) however, showed the enormous difference in market share between the major three auction houses (Christie's, Sotheby's and Phillips de Pury & Company) and the rest. This gives one aspect on the situation and the turnover chart was necessary to verify this. The depiction of all 70 auction houses in a single chart was not considered useful and for this reason the remaining 67 auction houses were clustered together (shown with green colour in the chart) and they are showing a surprising 2.64% of total turnover for all 12 artists. The number of artists of the sample and the fact that they are internationally known leads us to the conclusion that this is most probably the market share status quo we would encounter, if all photographers whose work is sold through auction houses were included in the data. In other words there is statistically enough information to infer that the market of auctioned photographs is basically a triopoly consisting of three major sellers that share a total of almost 97% of the total market, and a large number of smaller sellers who share the rest.



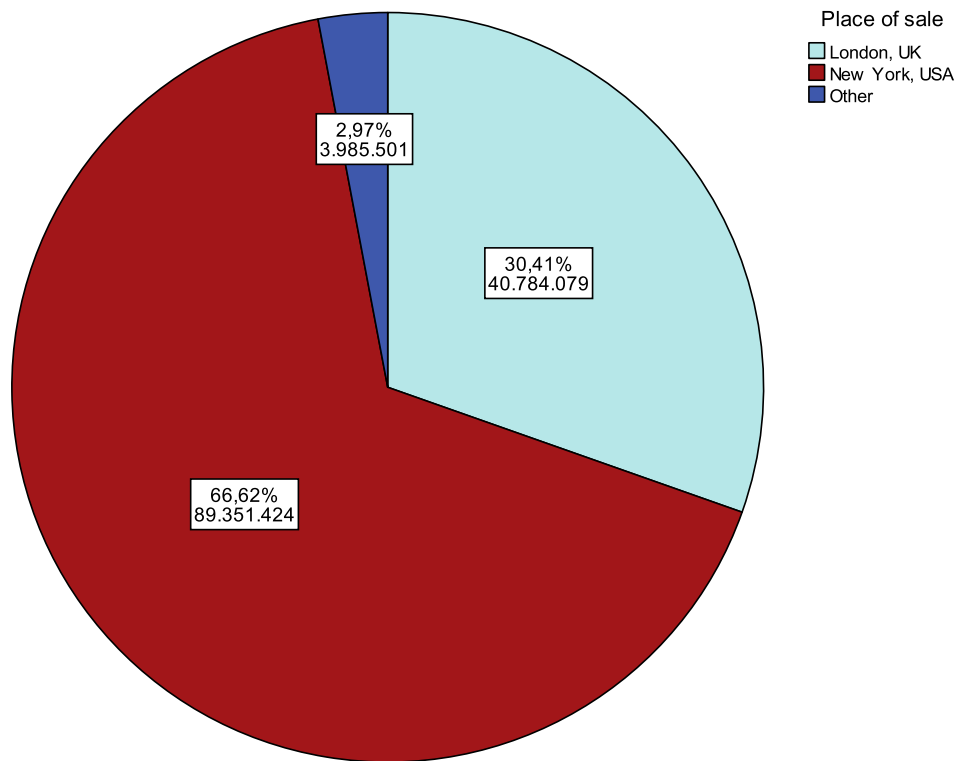
Pie chart on turnover percentage per auction house for all 3802 cases.

This situation shows the necessity of investigating its possible effects on the sale prices and this is mainly the reason why the auction houses were chosen as a separate variable to be tested as an indicator of price. Czusack¹²¹ derives from her findings that Sotheby's is more successful than Christie's in attracting vendors when it comes to Picasso paintings. In the case of photographers however this is not true as Christie's gathers almost 50% more revenue than Sotheby's and 45% of the total sample, according to the chart. There is no evidence on why this is so, and the reasoning behind it could be quite multi faceted (tradition, networks, etc) but can also be by chance. In any case the reasoning behind these market shares requires more a more specialised approach with appropriate data.

It is also important to notice the number of cases and the amount of total revenue that is gathered in different places where auctions are held. New York and London alone gather a striking percentage of 97% with other traditional art auction places for paintings for instance like Paris to be crowded with the remaining 36 cities around the globe in a 2.97% of total revenue. In the frequency of cases table for all cities (Appendix 1) Cologne comes in third place (206 transactions) but the turnover percentage is below 2 – 3% of the total. The number of cases can be explained from the fact that 7 out of 12 artists are Europeans, with 6 being from Germany and also living and working in Germany. The major source of auction revenue however, appears to be located “west of Berlin”. This cluster of transactions and apparently important transactions of hundreds of thousands of € is not by chance. For this reason the place of sale will be tested as a separate hypothesis in the analysis chapter. What is also interesting to note is the fact that these two categories are not irrelevant from one another. The major auction houses are traditionally located in London and New York even though they have departments in many other cities. Christie's for instance has further salerooms in Amsterdam, Dubai, Geneva, Hong Kong, Milan, Paris and Zurich, while Sotheby's is also found in Doha (Middle East), Sydney and Melbourne. However the two major cities in combination with the three large auction houses seem to have the lion's share in the photography auction market. What strikes as surprising is the apparent absence of Paris among the cities with the most revenue. Paris seems to be active in photography with the organising of the Paris-Photo an event that has taken place every year for 12 years now (Artprice.com, 2009) and attracts many collectors of vintage and modern photographs from all over the world. However the participation of auction houses in

¹²¹ Czusack, C. 1997. Picasso paintings at auction, 1963-1994. *Journal of cultural Economics* vol:21 229-247.

this event like Artcurial, Piasa and Ader which set up thematic sales, doesn't seem to influence the overall market share of Paris in the auction market, at least not to the contemporary part.



Pie chart on turnover percentage per place of sale for all 3802 cases.

By this point the reader should have a clear image of the photography auction market depending on the descriptive data of this chapter. In the methodology chapter the further analysis and the variables chosen will be presented and in the analysis chapter the results of the study.

5. Methodology

5.1 Introduction

In this chapter the methodology of the research is discussed. The sections following deal with the variables and hypotheses generated, the data collection and the statistical methods used to draw conclusions.

5.2 Variables

The variables chosen for this study derive from the auction sale database of Artprice.com. The data was chosen by artist name and then transferred to SPSS. The variables consist of most information that could be derived from these databases and are coded as follows:

5.2.1 Size

The size of the artwork plays a very important role in all visual arts in determining the price. By the use of several artists I will try to show the amount of this impact on the price for the whole sample of twelve artists and for each one separately. The height and width are multiplied to produce the variable used in cm². In rare cases of artworks which are transparencies in light-boxes the third dimension is not taken into consideration and the artwork is treated as a two-dimensional print.

5.2.2 Type of print

This variable states the different types of print as described in the database. A basic distinction is between colour prints and black&white which are given as "Gelatine silver prints". The colour prints are divided into the following categories: C-print stands for Chromogenic print and it is the most commonly used type of colour paper for photographs. Cibachrome is a less common type of material which was used to print directly from colour transparencies (slides) and was much more expensive. Today the vast majority of conventional printing has been substituted with digital printers which use either inks or chemicals. These are mostly encountered for artworks printed around the year 2000 and beyond. These prints, when specified, are marked as "Digital print".

5.2.3 Year of artwork

The year of artwork states the year when the photo was originally taken. This does not mean however that the print was made the same year. In some cases there were two dates available with the second indicating when the image was printed or reprinted at the certain size. Due to lack of adequate information for most cases these reproduction dates have been omitted and the original shooting date is used. For this reason “vintage” (old prints) are treated as contemporary prints in this study.

5.2.4 Year of sale

The year of sale indicates the year when the artworks were hammered down. This variable is not used as an independent variable but to group the cases in a time series and make the comparison between years possible.

5.2.5 Place of sale

This variable is used in descriptive statistics to show which city (and country) are the most popular places for selling art photographs in auctions. The distinction between city and country in two separate variables was not considered necessary as the city is probably the one that plays the most significant role for an auction and not the country in general.

5.2.6 Auction house

Another variable used primarily in descriptive statistics to state the popularity of certain auction houses over others which in this market comes to no surprises. It is interesting of course to check this frequency of cases for each artist separately and make comparisons.

5.2.7 Price

The prices are the dependent variable in this analysis but are also presented with descriptive statistics to show the disparity of values the mean prices and their standard deviations per artist and year. For this reason the price per cm² was also computed to check its tendency in a period of eight years. All prices acquired from

Artprice.com have been adjusted with a base year in 1997 so that it allows users to objectively compare the trends in the market value of different artists.

5.3 Hypotheses

The goal of my thesis is twofold. The first one is to describe a part of the secondary market on art photography using auction sale data. The second one is to specify the amount of impact of several determinants on the hammer price of a contemporary photographic artwork. From this second section several hypotheses can be formulated.

The artists are evaluated by experts and according to the criticism attributed to their work the estimates that auctioneers make are higher. By testing prices in this database it means that these estimates have been accepted by the buyers as the price levels of the artists.

H1: Each artist (reputation) affects the price of the artwork.

The effect of artwork size in the hammer price implies that the larger the size of the artwork the higher the hammer price at an auction must be. This is generally accepted by literature for all visual art objects and especially for painting¹²²

H2: The size of the artwork increases the price of the artwork (controlling for the reputation of the artist)

The effect of the artwork year in the price implies that the older the photograph the higher value it has accumulated (in a cultural sense) and this is reflected on its price. In the case of contemporary photography this is an open question and this analysis will attempt to shed some light on it within the restrictions of the data available.

H3: The age of the artwork increases the price of the artwork. (controlling for the reputation of the artist)

The type of print may influence the estimates and therefore the price of the photograph. This is examined at the same manner as in painting where oil canvas is priced differently than acrylic etc.

¹²² Sagot-Duvauroux, D. 2003. *Art prices*. In: Towse, R. (ed.) *A handbook of cultural economics*. Edward Elgar, 57-68.

H4: The type of print will influence the price of the artwork. (controlling for the reputation of the artist)

The place of sale is a factor that could also influence the price perhaps indirectly. Certain cities seem to attract the most important buyers because important auctions are traditionally held in these particular cities.

H5: The place of sale affects the price of the artwork. (controlling for the reputation of the artist)

The auction house and its reputation is another positive influence for a higher hammer price. It will be interesting to check this relation in comparison or combination with H4. This derives from the descriptives where the obvious oligopoly of three major auction houses dominates the entire market. This leads to a certain reputation of the three that could have a (positive) influence on the price.

H6: The auction house affects the price of the artwork. (Controlling for the reputation of the artist)

5.3.1 Hypotheses testing

The analysis will go on to evaluate the impact of several predictors (independent variables) on the price (dependent variable) as stated in the hypotheses above. For this reason a number of linear regressions will be performed to check the impact of every predictor on the price. The number of cases for each artist (with two exceptions of Wall and Welling) is adequate (over 100 cases) to perform such regressions¹²³. In order to be able to measure the effects of each artist, without assuming that all have the same amount of influence on the price, 11 dummy variables were computed for every artist with Andreas Gursky being the reference category. In the same manner all variables that stemmed from nominal data were turned into dummy variables. The “type of print” variable was turned into 3 dummy variables labelled “cibachrome”, “gelatine silver print” and “digital” with “C-print” being the reference category. The “Place of sale” variable initially included 39 different cities across the globe but it was considered helpful to cluster 36 of those into one and use it as a reference category in comparison to “London” and “New York”. In the same way the dummy variables for “Auction house” were computed. Out of 70 auction houses mentioned in the data, 67 of those were clustered together into the

¹²³ Field, A. 2005. *Discovering Statistics using SPSS*. London, UK. Sage Publications.

reference category and are compared to “Christie’s”, “Phillips De Pury & Company” and “Sotheby’s”.

The regression model is the linear regression model and the equation of the general research question for this study can be written as:

$$\text{Price} = \beta_0 + \sum \beta_i^*(\text{artist}_i) + \beta_j^*(\text{size}) + \beta_k^*(\text{age of artwork}) + \sum \beta_l^*(\text{type of print}_l) + \sum \beta_m^*(\text{place of sale}_m) + \sum \beta_n^*(\text{auction house}_n)$$

β_0 = the coefficient of the reference category (Andreas Gursky is the ref. category in this analysis).

β_i = the coefficient of each of the 11 remaining artists.

β_j = the coefficient of the size variable

β_k = the coefficient of the age of artwork (Year of Sale – Year of artwork)

β_l = the coefficient of each of the three types of print (cibachrome, gelatine silver and digital)

β_m = the coefficient of each of the two places of sale (London, New York)

β_n = the coefficient of each of the three major auction houses (Christies, Phillips, Sothebys)

In the testing of hypotheses where the coefficients of dummy variables are computed (β_i , β_m , β_n) the reference category is Andreas Gursky in combination with the relative reference categories (C-print, Other auction houses and Other places of sale).

From this general model each individual linear regression model containing dummy variables is used. For instance to test the first hypothesis for artists the above equation can be written $\text{Price} = \beta_0 + \beta_1^*(\text{artist2}) + \beta_2^*(\text{artist3}) + \beta_3^*(\text{artist4}) + \beta_4^*(\text{artist5}) + \beta_5^*(\text{artist6}) + \dots + \beta_{11}^*(\text{artist12})$. At this point the multiple regression analysis starts bringing each of the other predictors (as dummies) in comparison to the dummy variables for artists. The second regression analysis is performed with size which is numeric and therefore does not need to be transformed. However size itself does not play the same role for each artist. In order to show this difference a number of interaction dummies were computed by multiplying each artist (dummy) with the size variable. From these computations 11 interaction artist-size dummy variables were generated and entered into the regression analysis. In the third regression analysis checking for the “age of artwork” hypothesis the first regression includes the numeric variable “age of artwork”, which is computed by deducting the “Year of artwork” from the “Year of sale”. Likewise, in the second step of the process 11 interaction artist-age of artwork dummies were created and added in the independent variable list. In the test of the fourth hypothesis concerning the type of

print, along with the three dummy variables computed for the main effects, 33 interaction variables were computed (11 artist dummies x 3 type of print dummies). In some cases there are artists who do not use certain materials. For instance Jeff Wall does not use digital methods and therefore the interaction dummy variable “wall-digital” is zero. These are therefore excluded from the coefficients tables. The same principle applies to all other similar cases. In the fifth hypothesis the variable “place of sale” is tested and therefore 22 additional interaction variables are computed (11 artist dummies x 2 place of sale dummies) or in other words the interaction of every artist with London and New York. Finally at the sixth hypothesis 33 additional dummies were computed showing the interaction of every artist and the three auction house dummies (Christie’s, Phillips, Sotheby’s).

The following chapter presents the analysis and its results as well as a general conclusion of the results of this thesis.

6. Analysis

6.1 Introduction

The analysis will continue with the regression analyses results testing every hypothesis stated in the methodology chapter. The presentation of the regression tables will include those from the main effects results and the ones from the interactions due to their bulkiness will be commented following afterwards. Each table shows the coefficients of each regression model and is therefore named coefficient table (CT).

6.2 Model results

CT 1

Model 1: Artists		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	125,260.382	5,354.165		23.395	.000
	dummy becher	-104,929.729	7,787.574	-.278	-13.474	.000
	dummy Höfer	-118,738.325	7,347.664	-.350	-16.160	.000
	dummy sherman	-90,038.277	6,222.999	-.391	-14.469	.000
	dummy sugimoto	-92,315.192	6,416.375	-.368	-14.387	.000
	dummy welling	-122,156.844	12,335.156	-.169	-9.903	.000
	dummy wall	-35,907.196	14,674.348	-.040	-2.447	.014
	dummy diCorcia	-113,154.167	8,826.730	-.244	-12.819	.000
	dummy Dijkstra	-104,314.208	9,611.021	-.199	-10.854	.000
	dummy demand	-79,697.570	10,399.048	-.137	-7.664	.000
	dummy ruff	-105,305.392	6,434.906	-.417	-16.365	.000
	dummy struth	-81,763.950	7,032.913	-.263	-11.626	.000

a. Dependent Variable: Price sold in euros
R Square: 0.092

The first regression model resulted in a rather poor fit of R Square (0.1) indicating that only a 10% of the variance could be explained with these predictors. In other words the very low and high prices of artworks could be explained to a limited extent by the reputation of artists alone. This is realistic when we take into consideration that practically all artists have auction sales of a few hundred or thousand € and the price can reach up to 7-figure numbers for some. The significance of the result however was encouraging as they were not a matter of

chance (Sig. = 0.000). In the coefficients table shown above (CT1) it is interesting to observe how – on average – the price level of the reference category (Gursky) is higher than all the rest. In order to compute the price of any other artist his B score has to be deducted (added negative score) to the B_0 (Constant). Wall therefore comes in second place and Demand, Struth and Sherman follow.

CT 2

Model 2: Artists & Size		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	50,985.026	5,463.040		9.333	.000
	dummy becher	-40,454.910	7,372.375	-.107	-5.487	.000
	dummy Höfer	-61,699.384	6,918.233	-.182	-8.918	.000
	dummy sherman	-34,406.577	5,934.762	-.149	-5.797	.000
	dummy sugimoto	-31,509.525	6,157.955	-.126	-5.117	.000
	dummy welling	-55,689.288	11,372.549	-.077	-4.897	.000
	dummy wall	-5,791.594	13,296.199	-.007	-.436	.663
	dummy diCorcia	-59,189.186	8,184.477	-.128	-7.232	.000
	dummy Dijkstra	-50,483.411	8,875.219	-.096	-5.688	.000
	dummy demand	-66,015.369	9,405.756	-.113	-7.019	.000
	dummy ruff	-80,726.149	5,873.500	-.320	-13.744	.000
	dummy struth	-54,077.098	6,423.424	-.174	-8.419	.000
	Size in cm2	3.050	.104	.460	29.245	.000

a. Dependent Variable: Price sold in euros
R Square: 0.259

This table shows therefore the price levels of each artist much better than a simple mean could do. What is also important to notice is the strong significance levels for every artist dummy <0.01 . The general assumption from this regression is that the artist reputation alone does seem to be able to predict a higher price to a certain extent. Therefore there is sufficient statistical evidence to verify the first hypothesis. From the descriptive statistics however we know that the variation of prices within the artists is quite large. In order to explain this remaining variance, additional predictor variables were added to the following analyses. Next regression includes the “size” variable.

The size variable when added into the regression analysis allows for 26% of the variance to be explained thus making the model fit much better. The analysis of variance of the whole model also shows a strong significance. In the second table

(CT2) the relation between Gursky and the rest remains almost the same with Wall being a little less expensive but his significance level drops greatly allowing the reader to infer that this coefficient is more a product of chance. The significance remains strong for every other artist. The coefficient of the size variable shows that on average a unit (cm²) increase in the size of the photograph rises the price with 3 € for each artist.

However the size might not have the same effect to every artist and therefore a series of interaction variables was calculated as mentioned in the methodology part. The table generated is not shown but is definitely worth commenting on. The fit of the model becomes even better reaching an R square value of 0.357 thus explaining 36% of the variance. The coefficients now show that some size interaction dummies effects are almost negated by the original size variable coefficient (Becher, DiCorcia). They certainly do not reach the 3.050 coefficient of the main effects table above. Sugimoto and Wall seem not to be influenced (their negative coefficients are quite low) but their significance levels are not adequate to verify that relation. In this regression the reference category is Gursky together with size (as a size interaction dummy variable). From these regressions we can assume that size plays an important role to defining a price but its level of effectiveness is not the same for every artist separately. Statistical evidence though is adequate to infer that there is a positive relation between artwork size and artwork price as stated in the second hypothesis.

The analysis continues with testing the main effects of the “age of artwork” variable. The age of artwork in the main effect analysis did not meet the expectations. The model fit was poor explaining a mere 9% of the variance. In the coefficients table the relations of the artist dummies remained similar towards the reference category but the new entered variable turned out to be insignificant. These results would generally leave out this variable and consider the hypothesis as not valid. However the computation of the interaction dummy variables of each artist with the age of the artwork gave out very interesting results. The R Square was increased to almost 14%. The significance levels for every dummy variable were 0.000 including the original “age” variable. The effect of age of artwork was practically negated for some artists (Sugimoto, Welling, DiCorcia, Dijkstra) while for others it even showed a positive relation (Wall, Demand, Sherman) and for Becher, Höfer, Struth and Ruff the relation was slightly negative.

CT 3

Model 3: Artists & Age of artwork		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	127,515.945	5,923.302		21.528	.000
	dummy becher	-100,607.642	8,636.221	-.257	-11.649	.000
	dummy Höfer	-118,849.681	7,559.479	-.343	-15.722	.000
	dummy sherman	-87,267.281	6,543.246	-.373	-13.337	.000
	dummy sugimoto	-90,902.991	6,564.014	-.359	-13.849	.000
	dummy welling	-120,815.425	12,793.496	-.163	-9.444	.000
	dummy wall	-33,055.985	15,373.356	-.036	-2.150	.032
	dummy diCorcia	-112,688.918	8,963.320	-.244	-12.572	.000
	dummy Dijkstra	-104,160.072	9,789.719	-.198	-10.640	.000
	dummy demand	-79,471.597	10,674.468	-.135	-7.445	.000
	dummy ruff	-104,451.264	6,591.109	-.406	-15.847	.000
	dummy struth	-80,692.629	7,166.596	-.259	-11.260	.000
	years between sale and creation	-249.574	223.750	-.021	-1.115	.265

a. Dependent Variable: Price sold in euros

R Square: 0.091

For Becher who is the oldest artist, even a generation older, the age of artworks seems to work surprisingly negatively for his prices. This means in other words that more recent artworks are the ones that sell more in comparison to older prints. For Gursky it also has a somewhat strong negative relation. This has probably to do with the different styles that he shows between the 80s and the 90s. Photographs from the 90s are mostly the ones he is better known for, and some of which have also reached the record levels of price which he holds like the “99 Cent” (1999). As a result there is no sufficient statistical evidence to infer that age of artwork and price follow a positive relation.

The analysis goes on to add the “type of print” dummy variables. The reference category in this case is Gursky and C-print. The fit of the model is again in the 10% area but still significant. The table of coefficients below (CT4) shows different relations between the artist dummies and the reference category. The significance levels for two of the three newly added variables are low meaning that any effect they can have is mostly occurred by chance. Only the cibachrome variable shows a significant positive relation to an increase in price. This is probably due to the material itself, which is less common and more expensive to buy. Generally we

could say that artists who have sold cibachrome prints have been associated with larger sale prices, especially in Gursky's and Wall's cases. For Wall the cibachrome coefficient counteracts with the artist's coefficient which is negative in relation to the reference category. The second regression concerning the type of print included 33 new dummy variables, each artist interacting with every type. However not all artists work with all materials and therefore some of those interaction dummies were automatically left out (scored zero). The R square was raised a little and reached 12% while certain interaction variables turned out insignificant. The certain analysis did not achieve anything better than the main effects regression. From this analysis no statistical evidence showed a definite connection between type of print and price with perhaps the exception of colour prints from the main effects regression model.

CT 4

Model 4: Artists & Type of print		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	117,686.558	5,466.167		21.530	.000
	dummy becher	-89,658.621	9,431.184	-.237	-9.507	.000
	dummy Höfer	-113,277.074	7,361.715	-.334	-15.387	.000
	dummy sherman	-82,151.468	6,397.143	-.356	-12.842	.000
	dummy sugimoto	-76,996.905	8,399.959	-.307	-9.166	.000
	dummy welling	-110,912.784	12,633.096	-.153	-8.780	.000
	dummy wall	-48,883.418	14,809.510	-.055	-3.301	.001
	dummy diCorcia	-107,060.696	8,832.508	-.231	-12.121	.000
	dummy Dijkstra	-99,693.141	9,588.415	-.190	-10.397	.000
	dummy demand	-73,512.693	10,803.900	-.126	-6.804	.000
	dummy ruff	-99,358.286	6,489.108	-.394	-15.312	.000
	dummy struth	-76,680.059	7,234.747	-.247	-10.599	.000
	dummy cibachrome	37,204.750	6,061.214	.101	6.138	.000
	dummy gelatinsilver	-7,744.463	5,494.489	-.039	-1.409	.159
	dummy digital	-9,567.917	9,837.115	-.016	-.973	.331

a. Dependent Variable: Price sold in euros

R Square: 0.102

In this case the hypothesis should be partly rejected, meaning that it is true for certain types but it is not true for every type of print. In order for this to be tested more thoroughly perhaps a larger sample with more details on the type of print would be necessary. According to the present data, colour prints have a slight positive

influence but all other types are possibly obscured by other factors determining the price.

Next hypothesis to be tested is the place of sale. In this regression model the reference category is once more Gursky with the sum of small auction houses. The R square remained in the same levels as with the previous models. The significance levels for all coefficients however were quite high with nearly all being zero. The London and New York dummy variables were also significant and also showed a positive relation which was expected. It was also rational to see the coefficients of the artists becoming negative meaning that artists and small auction houses show lower prices on average. Then the interaction variables came into the regression analysis which surprisingly turned all artist dummies insignificant (even the reference category) making their coefficient values unreliable.

CT 5

Model 5: Artists & place of sale		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	97,586.126	6,228.653		15.667	.000
	dummy becher	-99,762.831	7,742.053	-.264	-12.886	.000
	dummy Höfer	-109,630.549	7,358.085	-.323	-14.899	.000
	dummy sherman	-87,787.736	6,215.670	-.381	-14.124	.000
	dummy sugimoto	-94,304.711	6,367.165	-.376	-14.811	.000
	dummy welling	-120,075.019	12,244.887	-.166	-9.806	.000
	dummy wall	-36,938.464	14,545.160	-.042	-2.540	.011
	dummy diCorcia	-115,096.621	8,776.303	-.248	-13.114	.000
	dummy Dijkstra	-102,622.609	9,533.262	-.196	-10.765	.000
	dummy demand	-80,418.933	10,303.787	-.138	-7.805	.000
	dummy ruff	-100,846.808	6,397.052	-.399	-15.765	.000
	dummy struth	-81,680.243	6,971.240	-.263	-11.717	.000
	dummy london	36,599.747	4,658.562	.160	7.856	.000
	dummy new york	29,942.761	3,935.667	.157	7.608	.000

a. Dependent Variable: Price sold in euros

R Square: 0.109

The fit of the model was again increased by 2 percentage points to reach 12%. In the interaction regression the coefficients of the place dummies are both significant and contribute positively to the dependent variable, however the interaction dummy coefficients lowers this effect for most artists but it still remains

positive. It is interesting to notice that London has a higher coefficient score than New York even though the descriptives show a lion's share for number of cases and turnover for New York. This is probably explained by the fact that some of the most expensive artworks, the two most expensive to be exact, were sold in London. New York of course is not far behind. Wall is the only artist who appears insignificant in the table. This analysis shows that the place of sale and especially the two major cities play a positive role in the increase of prices, therefore the fifth hypothesis should be considered to be valid.

Finally to test the auction house hypothesis the dummies of the three major auction houses were tested in comparison to the reference category of Gursky and the sum of the remaining auction houses. A similar situation as with the place of sale can be described for the auction houses as well (CT6 below).

CT 6

Model 6: Artists & auction house		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	97,782.749	6,315.828		15.482	.000
	dummy becher	-101,275.828	7,738.633	-.268	-13.087	.000
	dummy Höfer	-109,569.142	7,375.485	-.323	-14.856	.000
	dummy sherman	-88,894.254	6,176.579	-.386	-14.392	.000
	dummy sugimoto	-95,451.180	6,376.626	-.381	-14.969	.000
	dummy welling	-120,943.403	12,236.063	-.167	-9.884	.000
	dummy wall	-36,979.159	14,549.573	-.042	-2.542	.011
	dummy diCorcia	-114,740.456	8,792.011	-.248	-13.051	.000
	dummy Dijkstra	-105,690.616	9,531.622	-.202	-11.088	.000
	dummy demand	-79,808.411	10,311.047	-.137	-7.740	.000
	dummy ruff	-100,831.768	6,404.616	-.399	-15.744	.000
	dummy struth	-82,200.284	6,973.695	-.264	-11.787	.000
	dummy christies	34,079.812	4,385.371	.174	7.771	.000
	dummy phillips	25,661.010	4,772.293	.111	5.377	.000
	dummy sothebys	33,273.155	4,570.053	.156	7.281	.000

a. Dependent Variable: Price sold in euros
R Square: 0.108

Again a model fit of 11% is shown and the significance levels are identical with the ones of CT5. The same goes for the standardised betas indicating that place of sale and auction houses cases are dispersed in a similar way and are therefore

affecting the artist coefficients. In this case however the coefficients of the auction house dummies reflect the market shares of each auction house. Christie's shows a value of 34,079 with Sotheby's following closely with 33,273 and Phillips in the third place with 25,661. With the addition of the interaction dummy variables the effects are identical with those of the previous analysis with Jeff Wall appearing insignificant with all three auction houses meaning that any effect on prices of his artworks caused by the reputation of the auction is probably by chance. The coefficients for the auction houses show differences from the actual turnover percentages shown from descriptive statistics. Sotheby's appears to have a more positive influence, Phillips comes in second and Christie's shows the lowest coefficient among the three, always in comparison to the reference category of Gursky and the sum of smaller auction houses. From this analysis derives enough statistical evidence to infer that the large auction houses influence the prices of artists positively.

6.3 Conclusion

The field of photography has indeed much to show judging from the descriptive statistics presented in this thesis. It is a fairly new market which has grown significantly during the past two decades with prices having risen to almost double their levels of 1990. Even though the total turnover share of photography is quite low in comparison to the one of paintings, this constant increase shows that investors are starting to show more interest to other categories of artworks apart from paintings and drawings. This interest is also shown by the breaking of records for the highest price ever charged for a photograph like in 2007. 2008 was a correction year and 2009 may be even worse for the art market but as in all sectors of the economy there are always inflations and deflations of prices.

The above analysis presented a number of linear regressions and their findings. The artists were tested separately and then in combination with every other predictor. Additional regressions were carried out; one of those was a model with all main effect variables which showed nothing more than the individual regressions. As Buelens and Ginsburgh¹²⁴ stated in their study, the analysis of the whole dataset may lead to significant results but with low R^2 s, meaning that a low percent of the variance is explained by the model. This was also the case in this thesis. The goal was to identify the impact of these predictors on the price of artworks in combination with the reputation of artists which is a function of several variables by itself. The

¹²⁴ Buelens, N. , Ginsbergh, V. 1993. Revisiting Baumol's Art as a floating Crap Game. *American Economic Review* vol:37 1351-1371.

estimates which are given by experts play also a significant role in establishing the price levels and they can only be verified when the artwork is sold. In this study the reputation of artists was included in the artist variables. The tests of several other predictors led to the conclusion that size plays the most important role in explaining the great variance in prices something which is also found in painting auctions as is the case with all studies concerning¹²⁵. If the outliers of the dataset are excluded then this relation will probably be much stronger. This of course does not mean that the other predictors are not important in determining the price of an artwork. As The place of sale and the auction house variables showed that they influence prices to an extent, especially in particular combinations showing that certain artists benefit more from some auction houses than others. This however could be because of the artists' own reputation. Even if reputation acts as a potential bias in this case I still believe it didn't affect the impact of the auction houses partly because there is an overlap in that impact. The results of the age of the artwork test were also interesting to see. Older artworks from the same artist are not connected with higher prices at least for contemporary art. Buyers are apparently more interested in newer artworks a fact that could have many interpretations. It could have artistic reasons (subject, aesthetics) or purely technical (re-print on archival paper that ensures larger image life expectancy). This brings forward the variable "type of print". Unfortunately the data collected presented some inconsistencies in describing the material used in adequate detail. There were different descriptions used from each auction house that indicated the same type with alternative terms or the descriptions were too general. The fact however, that several types are mentioned means that the type of print is being taken into account when estimating prices. For this reason it would be advisable for all auction houses, galleries and other organisations active on art photography market to use a standard terminology, which can be provided by the International Standards Organisation (ISO).

6.3.1 Future research

The present thesis cannot describe the entire art photography market but it gives however some initial thoughts on how to look upon the art market and the different forms of art it deals with. For artists this is perhaps clear but for economists visual arts are usually taken as a whole or painting is used as a prime example, implying that all other elements comprising the visual art sector are either

¹²⁵ Worthington, A. Higgs, H. 2006. A note on financial risk, return and asset pricing in Australian modern and contemporary art. *Journal of cultural Economics* vol:30 73-84.

insignificant or they follow the exact same pattern as painting. This was a detail that I also wanted to confirm or reject by making this thesis. The result was that all categories follow the same pattern approximately but they differ in fluctuations between years. There was however no surprising case of one category showing a steep increase while others being on a downward slope. Of course in order to make a detailed comparison, data concerning both photographers and painters should be gathered following certain criteria (genres of artists, size of artworks etc) that was not possible in the given time frame. It could of course be the starting point of a future research. Another interesting aspect is the identification of the percentage of art photography in the primary market, in galleries for instance, in comparison with new paintings or also a demand study for art photography entering the market.

Also a repeat sales regression would also be interesting to explain more of this apparent booming of the art photography auction market during these two decades, provided that enough cases can be gathered from the total number of photographers whose works are sold at auction. Finally another very interesting research would be to make a comparison between contemporary and old masters of photography (Stieglitz, Steichen, etc) who also sell for high prices.

A final question which could not be covered by the data of this thesis is a general demand study for photographs; who buys photographic artworks, which country or region shows the greatest interest in the photographic medium; is there a preference in contemporary or old master work and by which kinds of buyers; answers to such questions may well contribute to the explanation of the price function for photographs.

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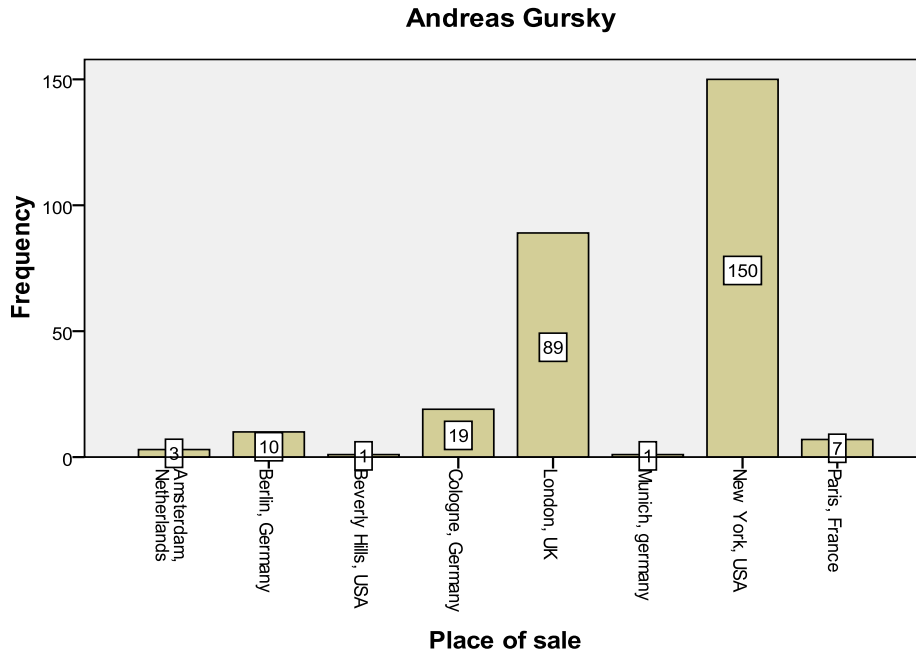
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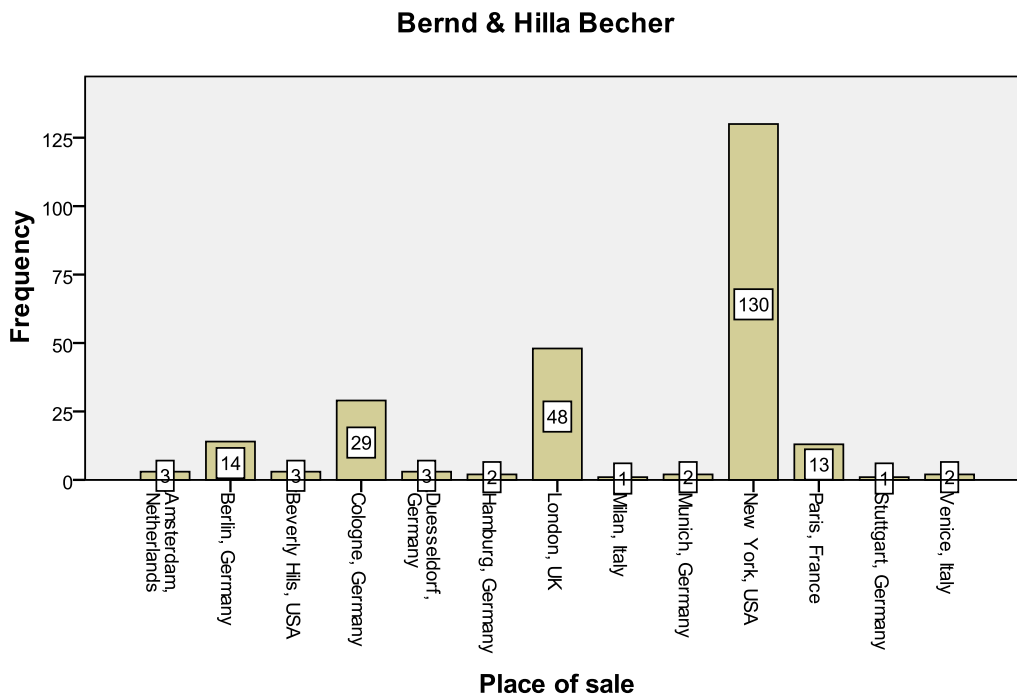
www.artprice.com
www.christies.com
www.phillipsdepurty.com
www.sothebys.com
www.rkd.nl

Appendix 1

Bar Charts Place of sale frequency per artist

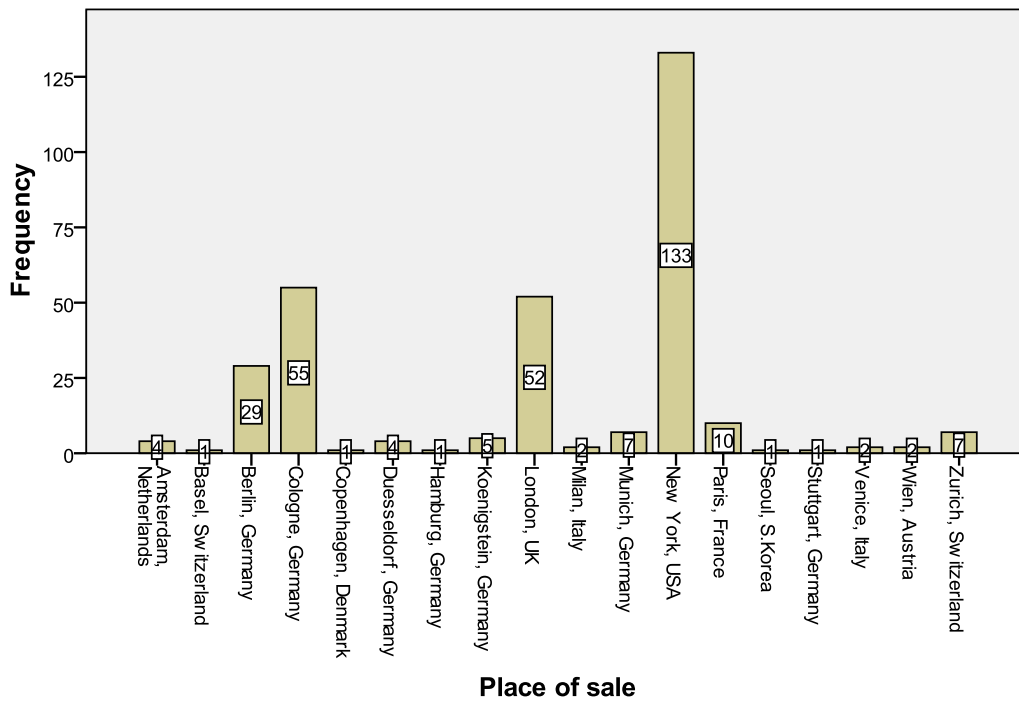


BC1.1 Cases time period: 1994-2009(March)



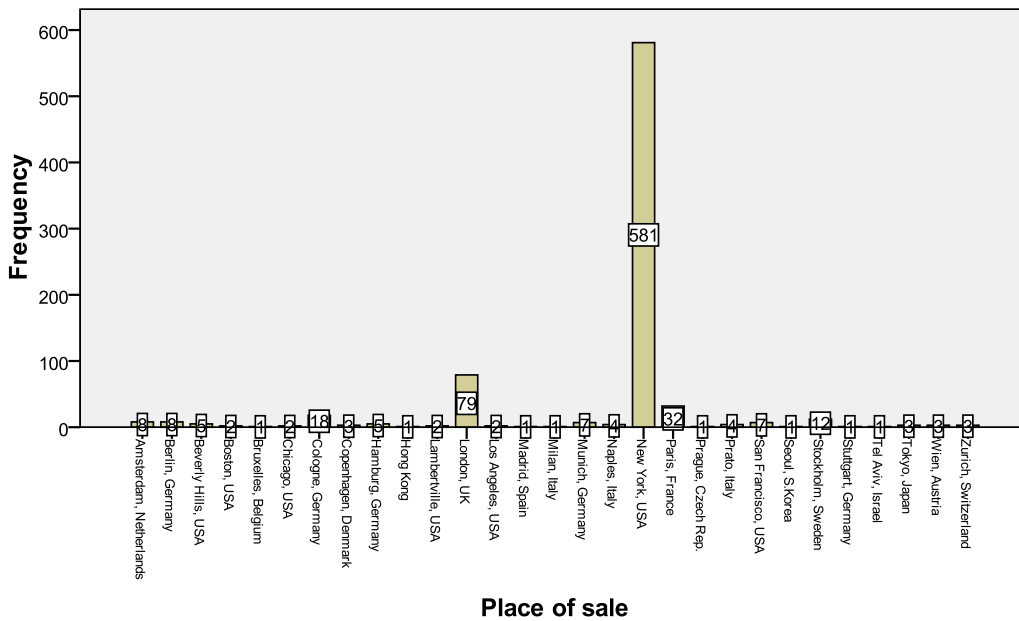
BC2.1 Cases time period: 1989-2009(March)

Candida Höfer



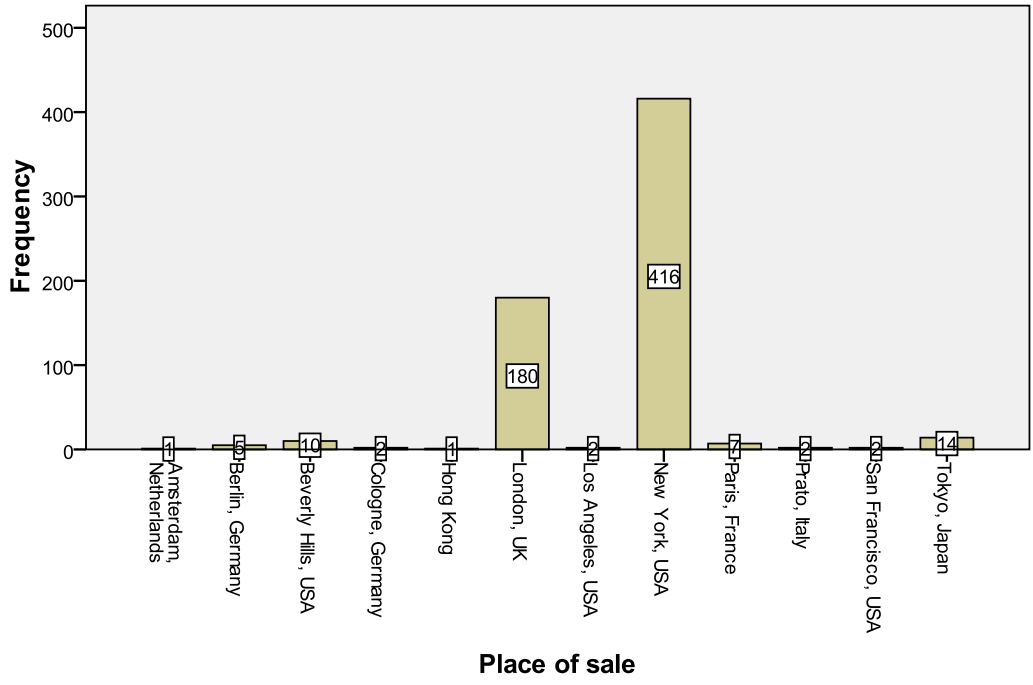
BC3.1 Cases time period: 1996-2009(March)

Cindy Sherman



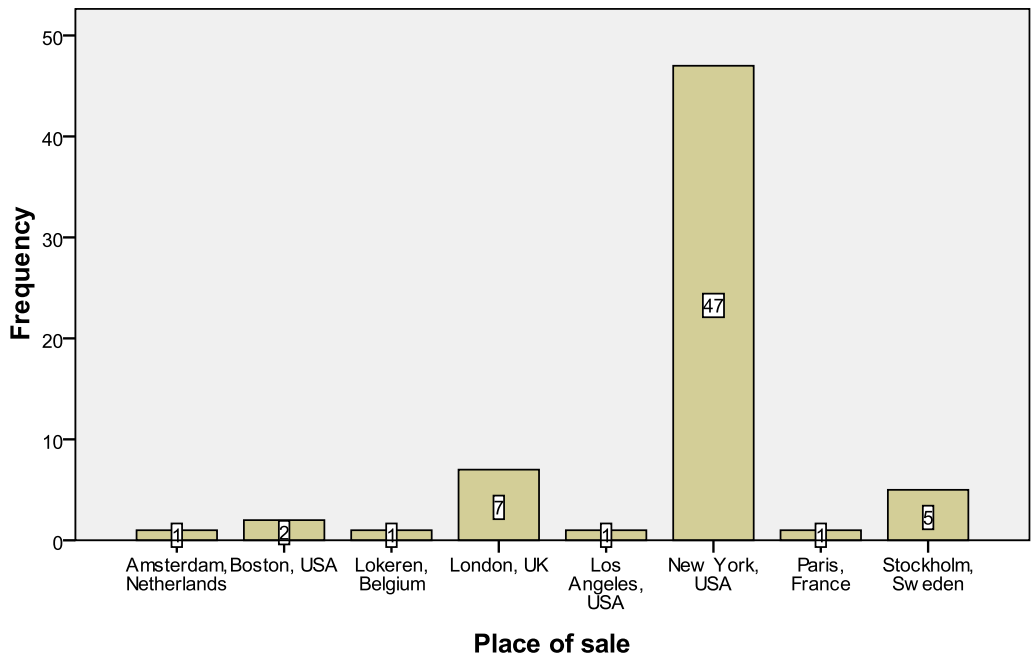
BC4.1 Cases time period: 1989-2009(March)

Hiroshi Sugimoto

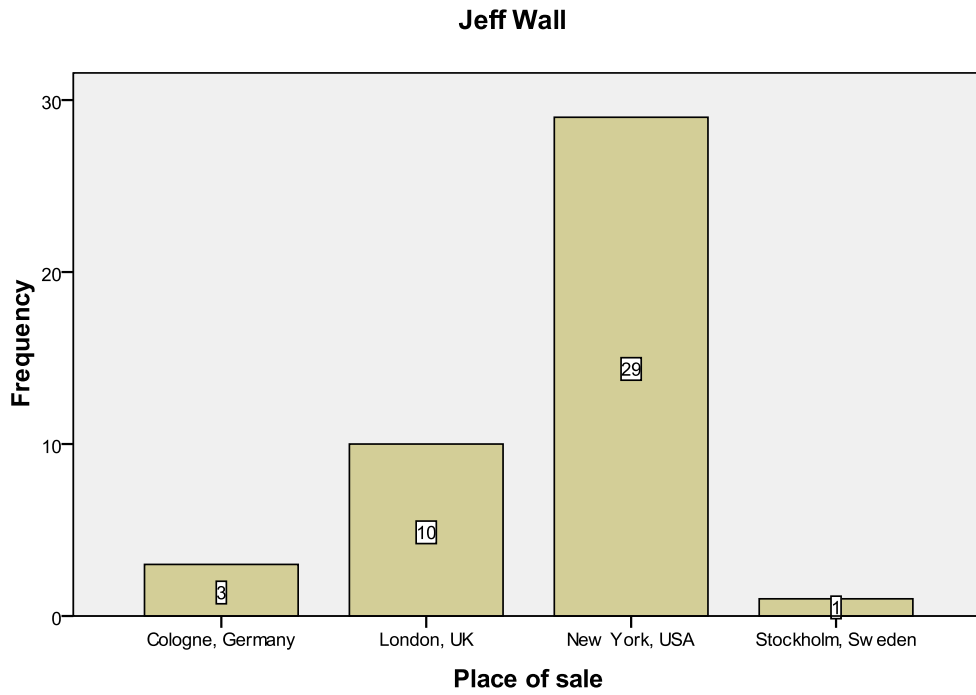


BC5.1 Cases time period: 1992-2009(March)

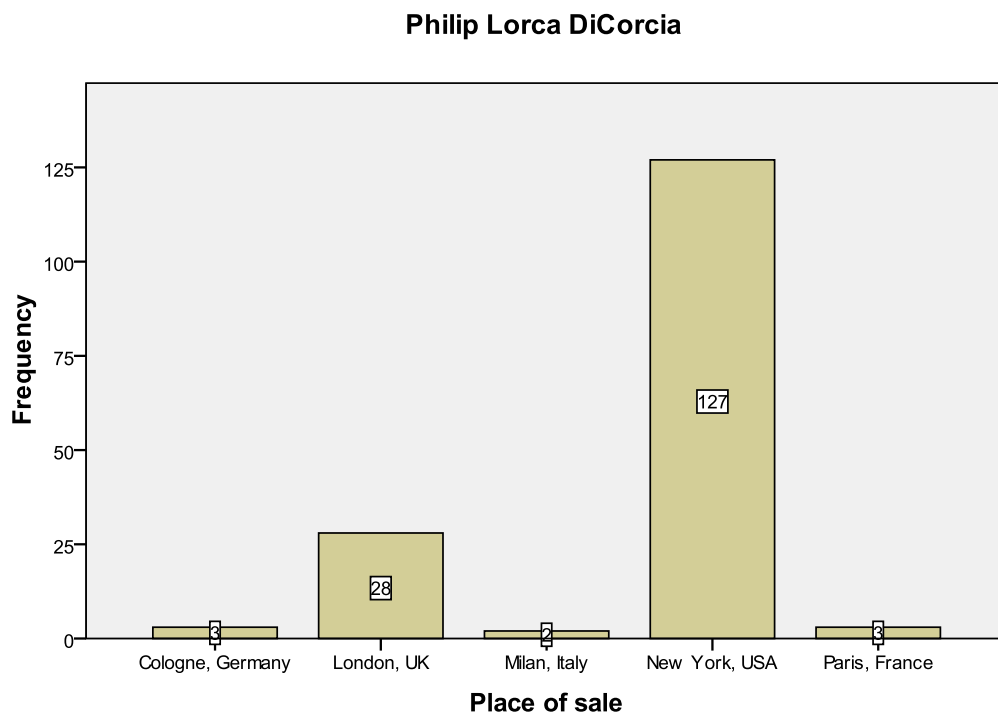
James Welling



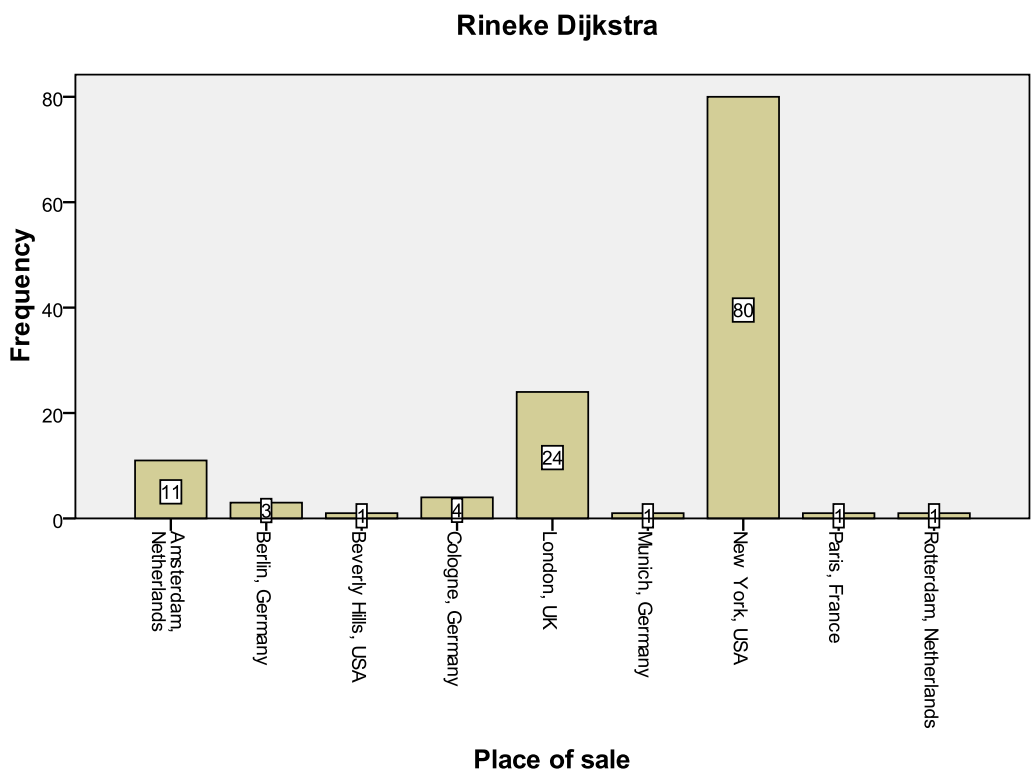
BC6.1 Cases time period: 1991-2009(March)



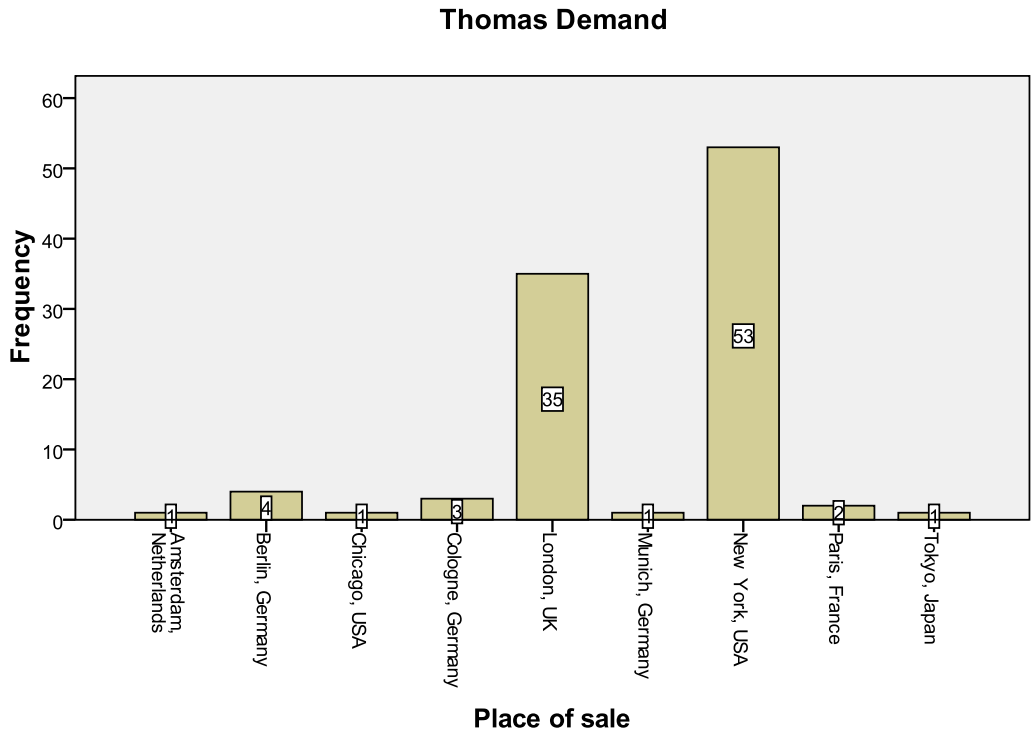
BC7.1 Cases time period: 1993-2008



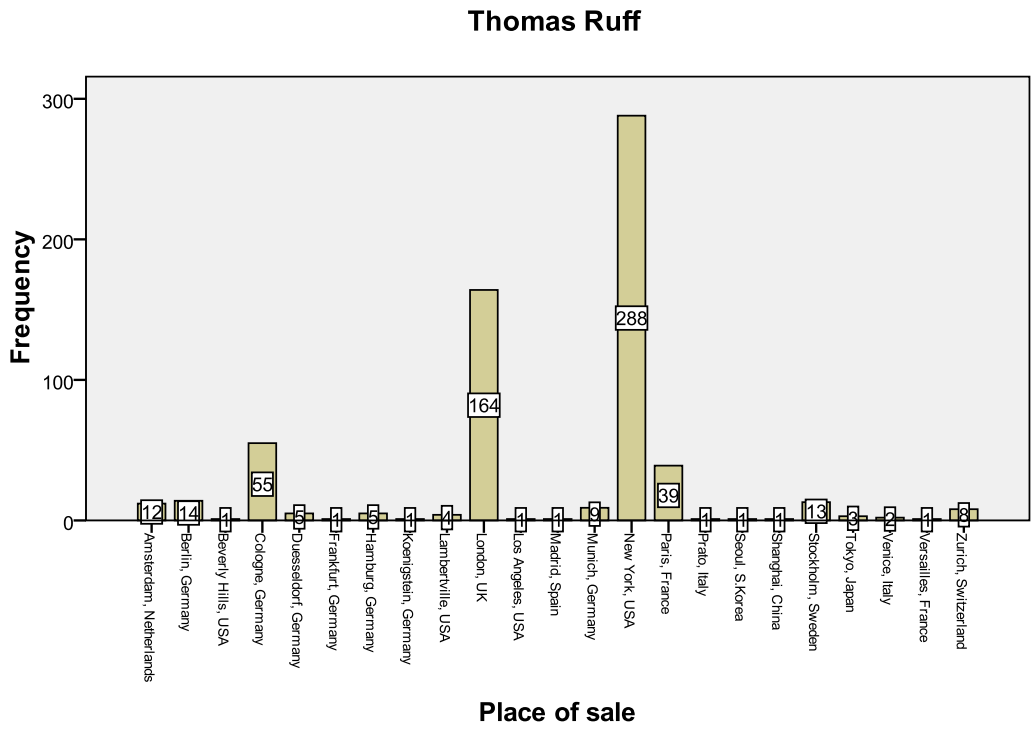
BC8.1 Cases time period: 1996-2009(March)



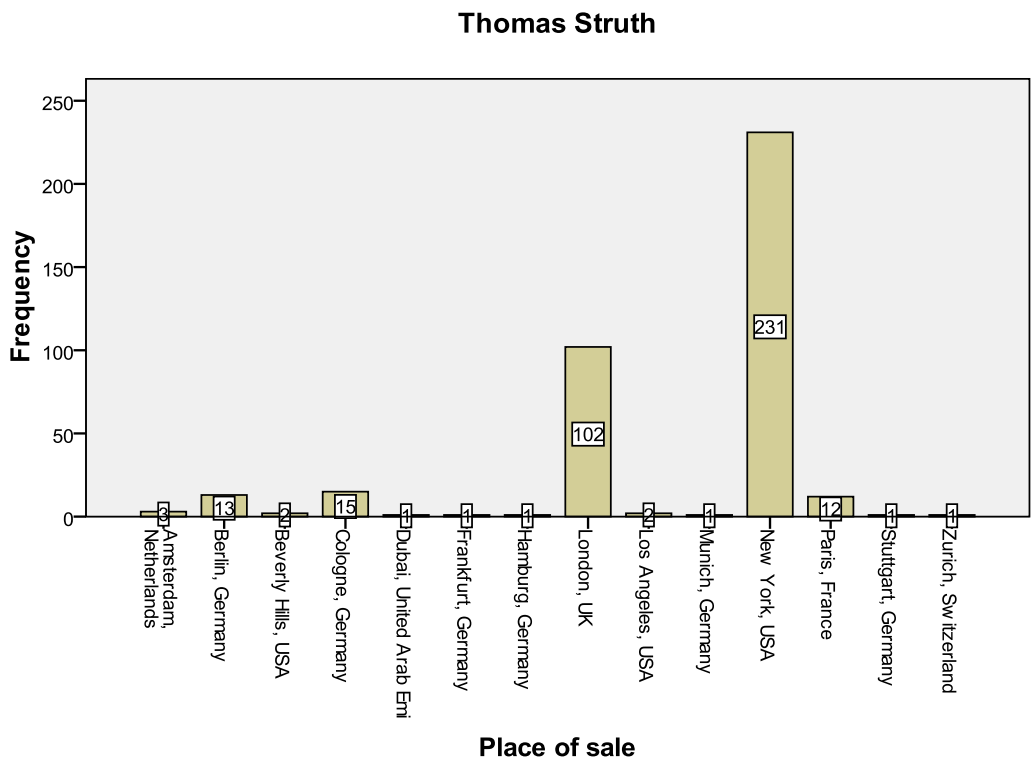
BC9.1 Cases time period: 1999-2009(March)



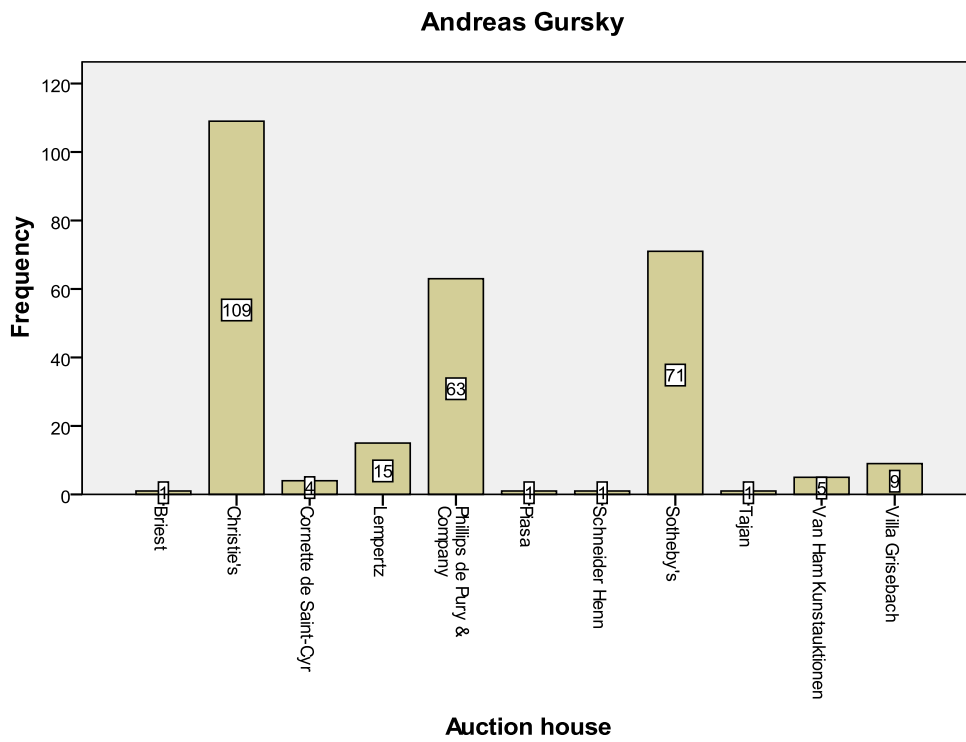
BC10.1 Cases time period: 2000-2009(March)



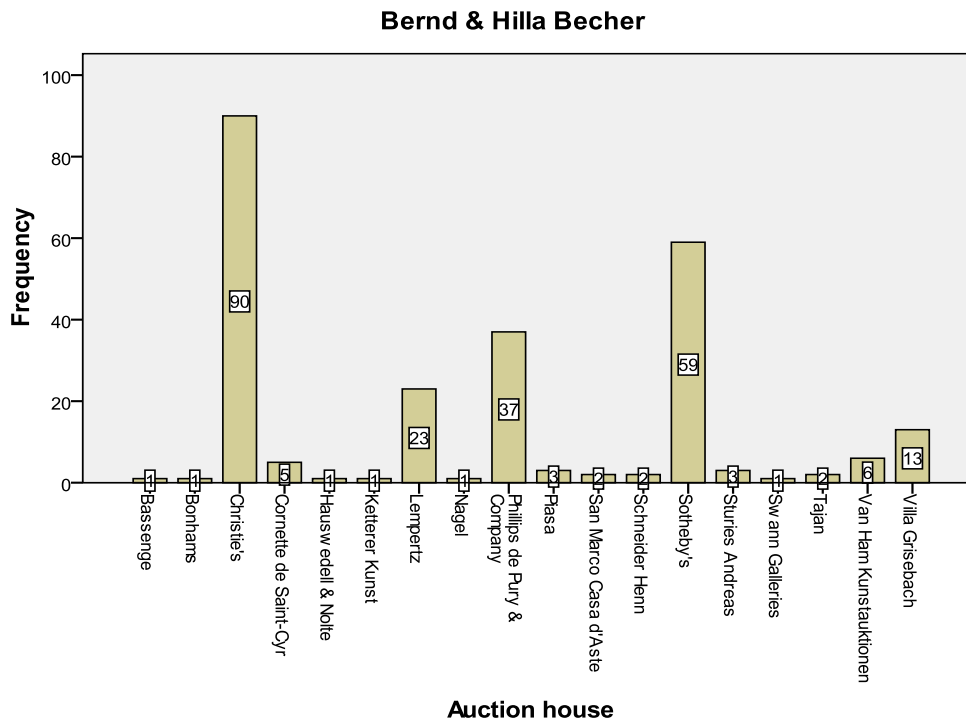
BC11.1 Cases time period: 1991-2009(March)



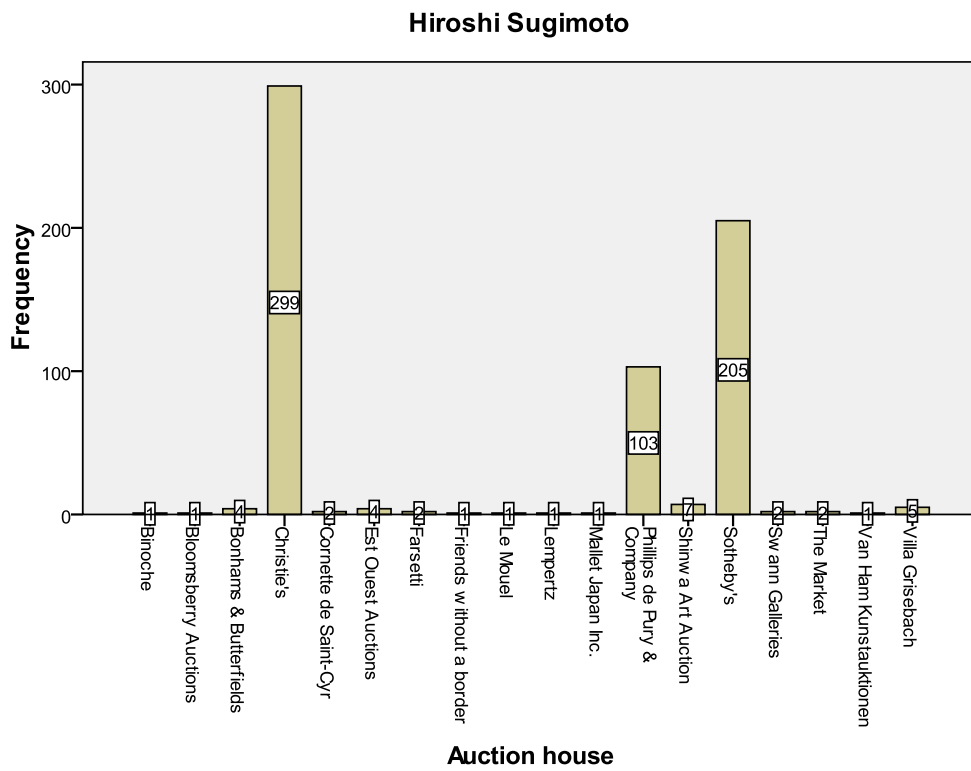
BC12.1 Cases time period: 1992-2009(March)
Auction house frequency per artist



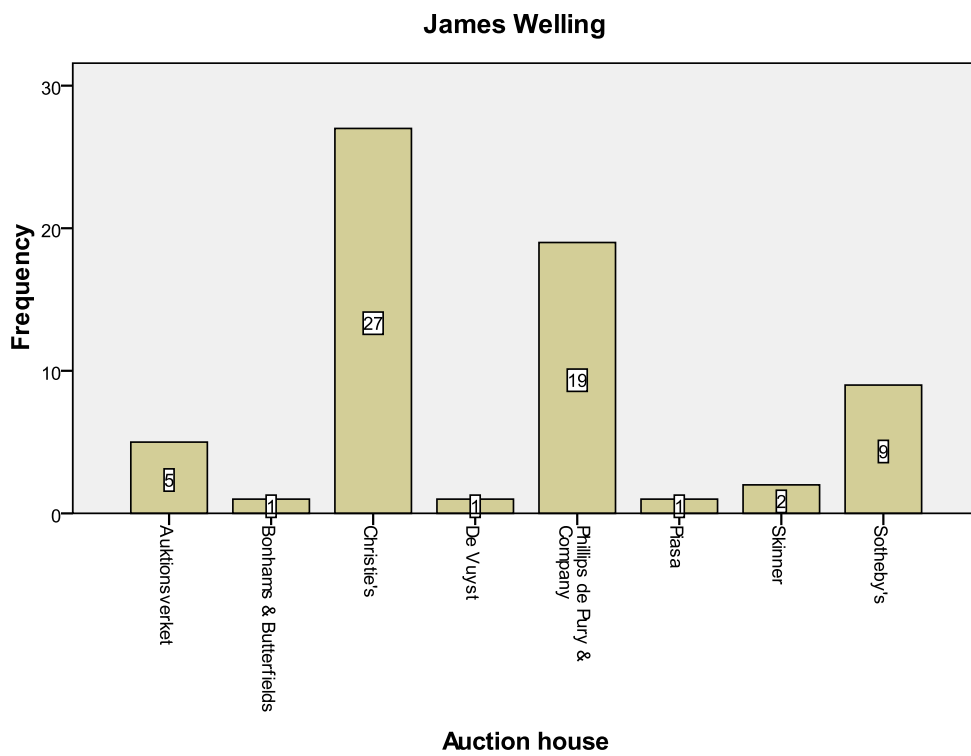
BC1.2 Cases time period: 1994-2009(March)



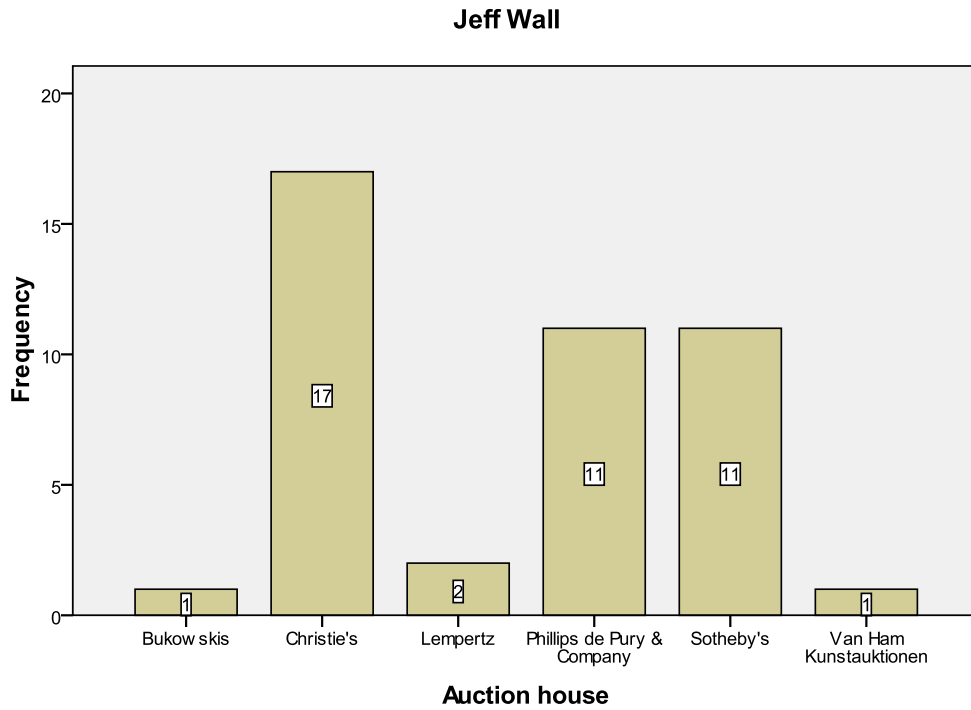
BC4.2 Cases time period: 1989-2009(March)



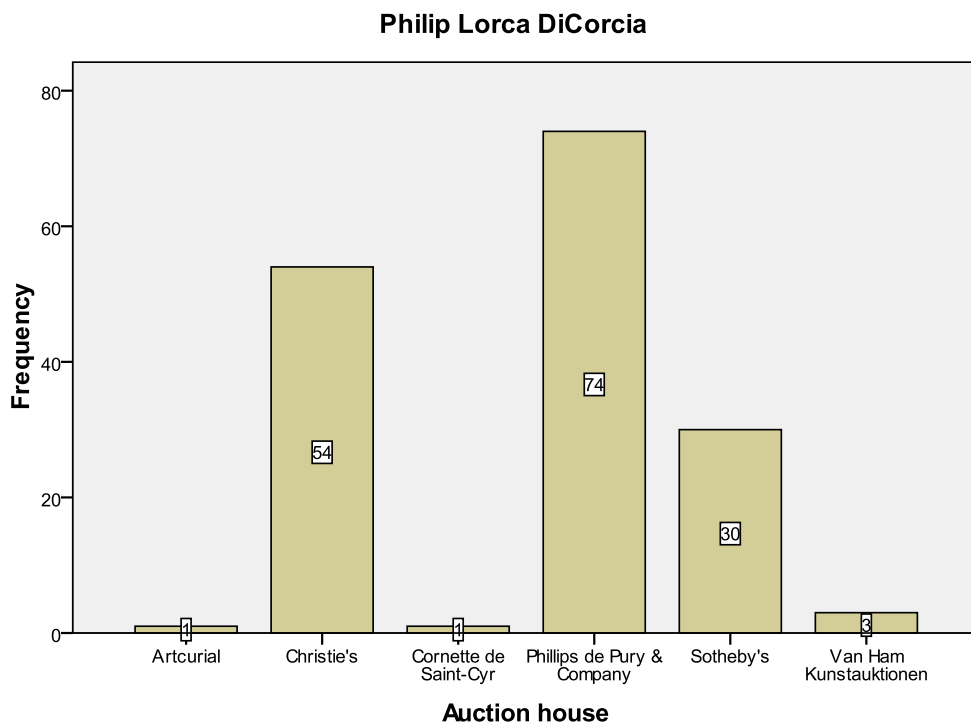
BC5.2 Cases time period: 1992-2009(March)



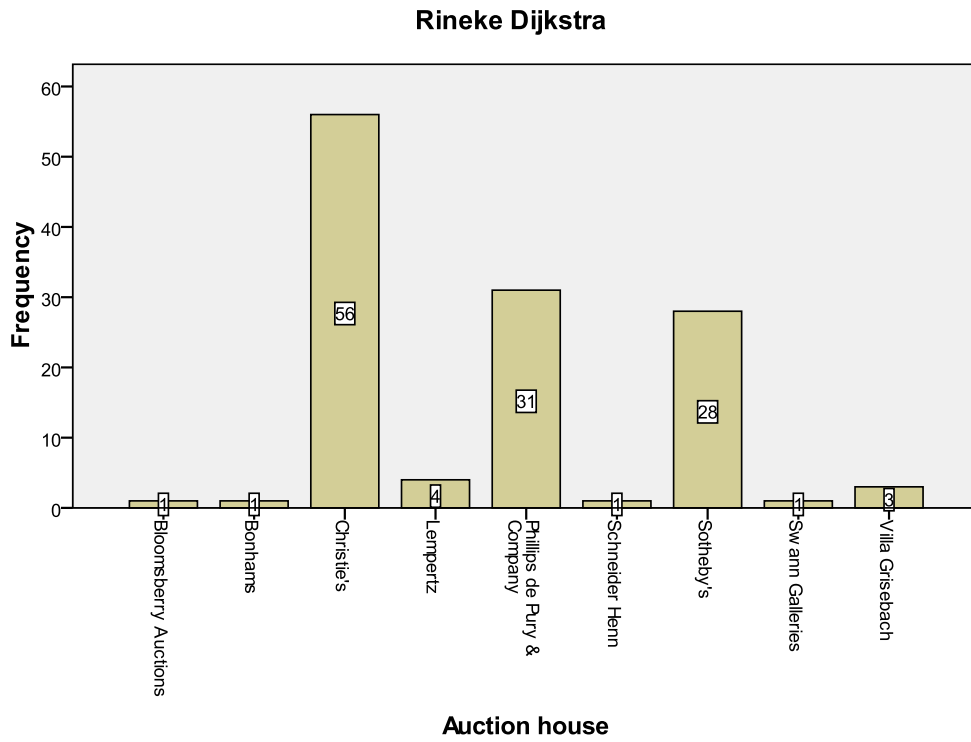
BC6.2 Cases time period: 1991-2009(March)



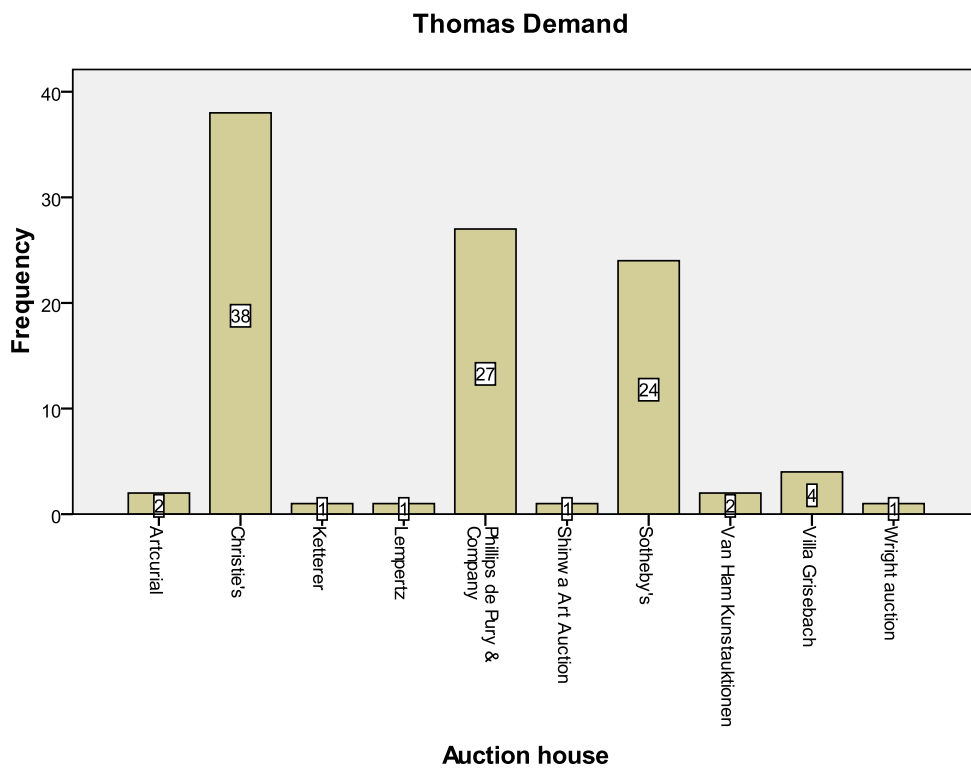
BC7.2 Cases time period: 1993-2008



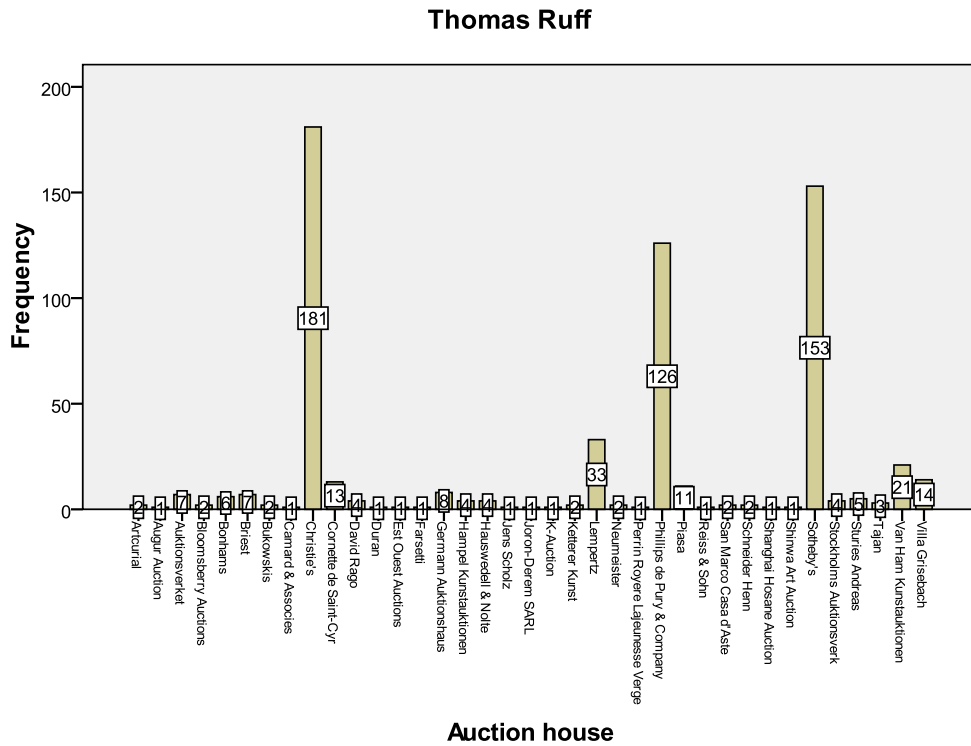
BC8.2 Cases time period: 1996-2009(March)



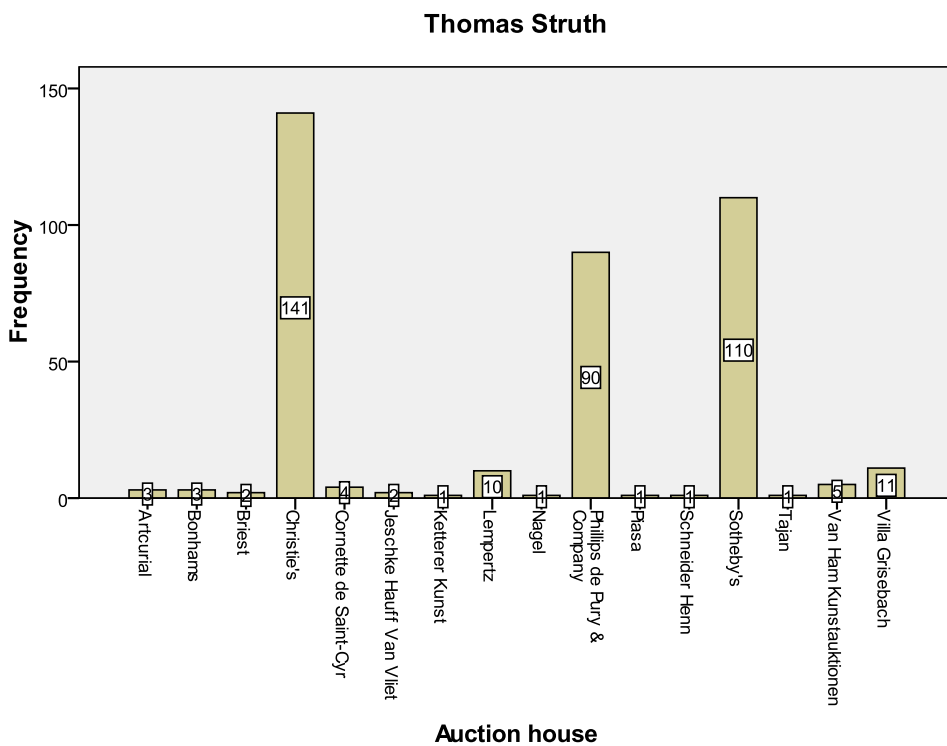
BC9.2 Cases time period: 1999-2009(March)



BC10.2 Cases time period: 2000-2009(March)

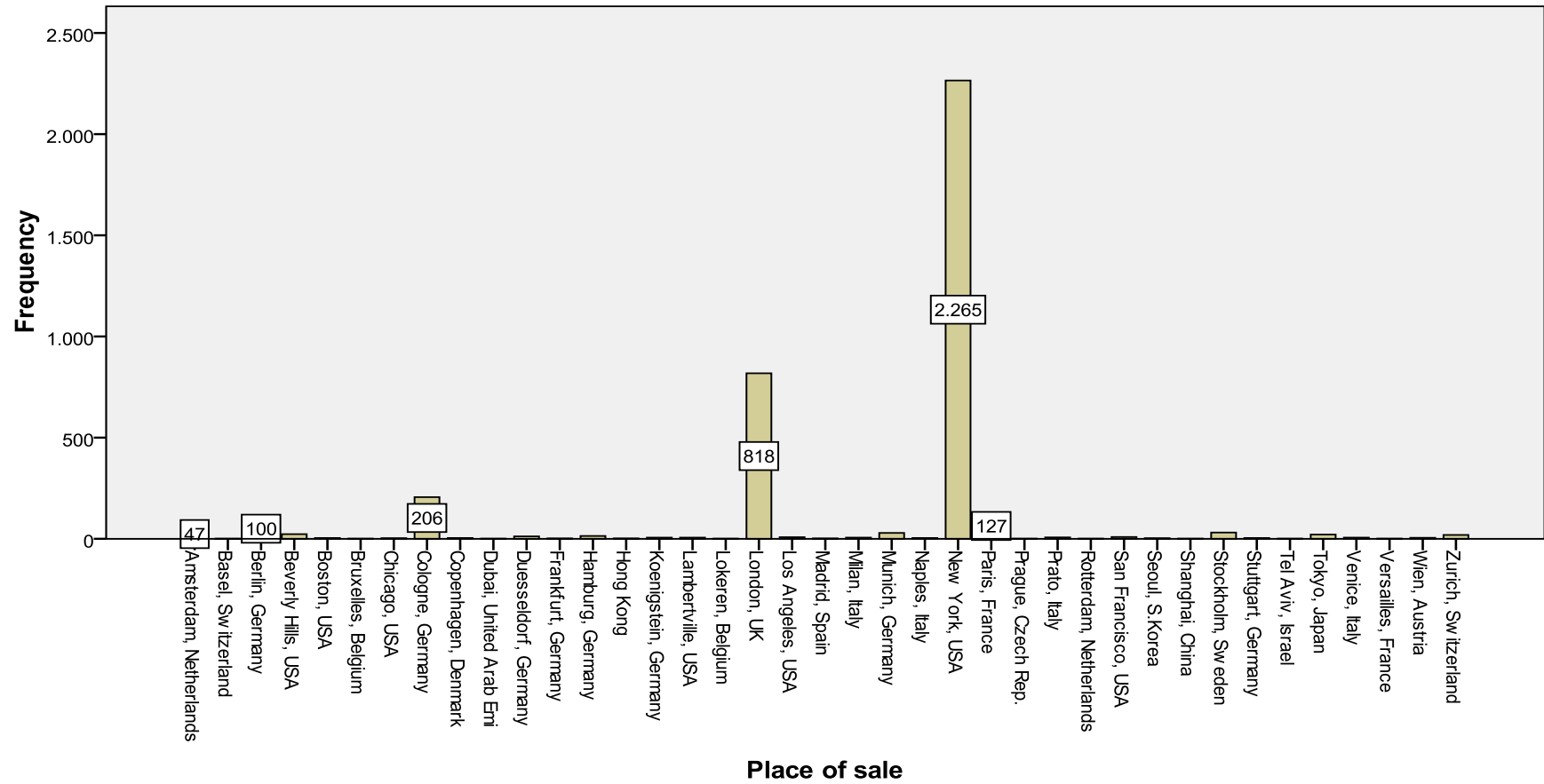


BC11.2 Cases time period: 1991-2009(March)



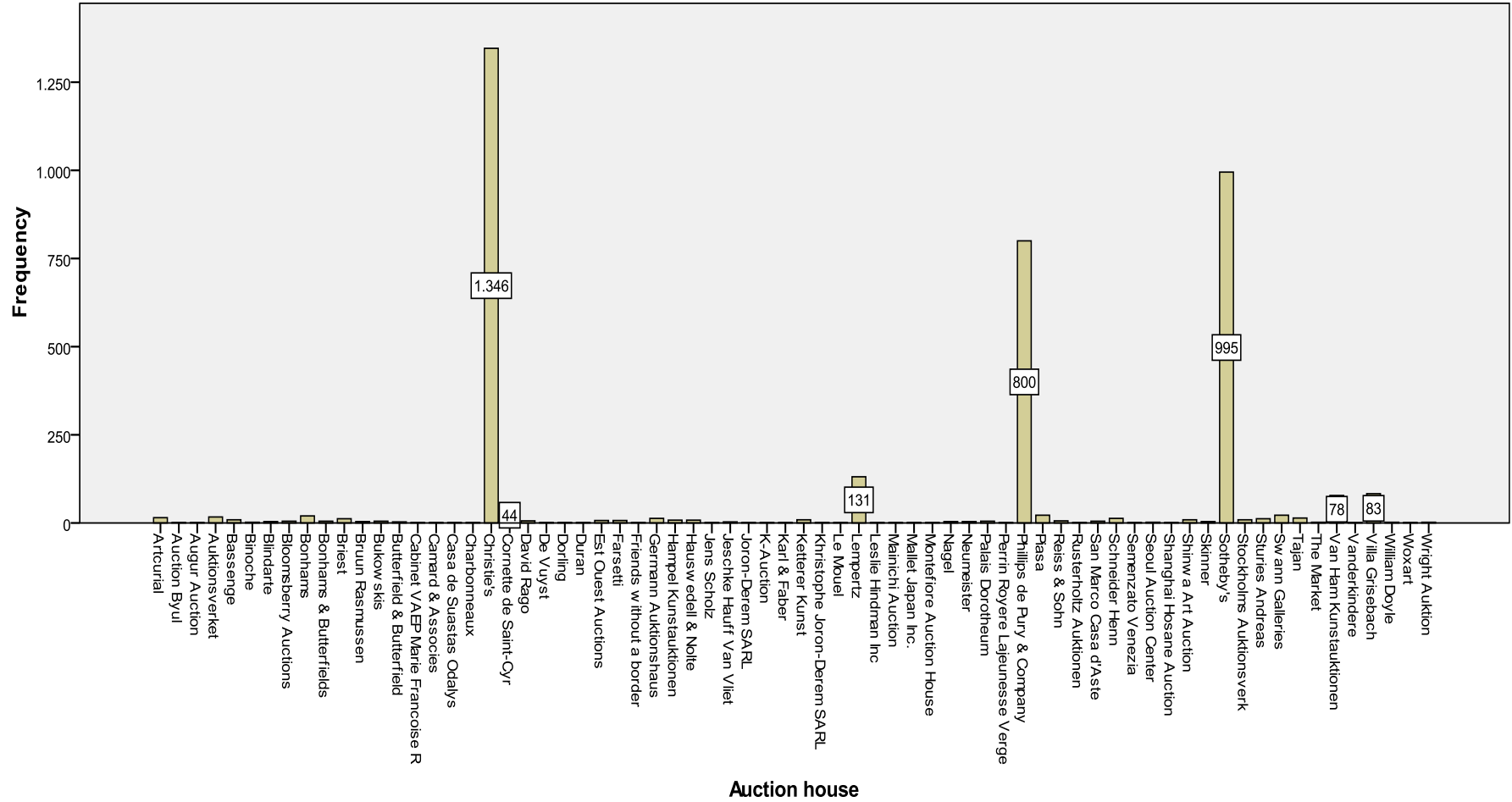
BC12.2 Cases time period: 1992-2009(March)

Frequencies of cases per Place of sale



Cases time period: 1989-2009(March)

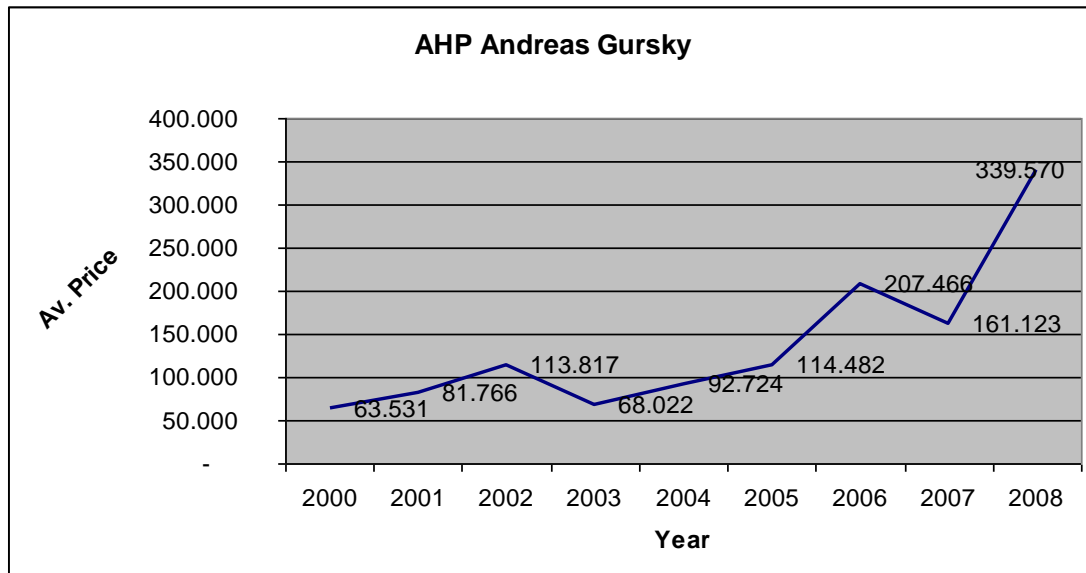
Frequencies of cases per Auction house



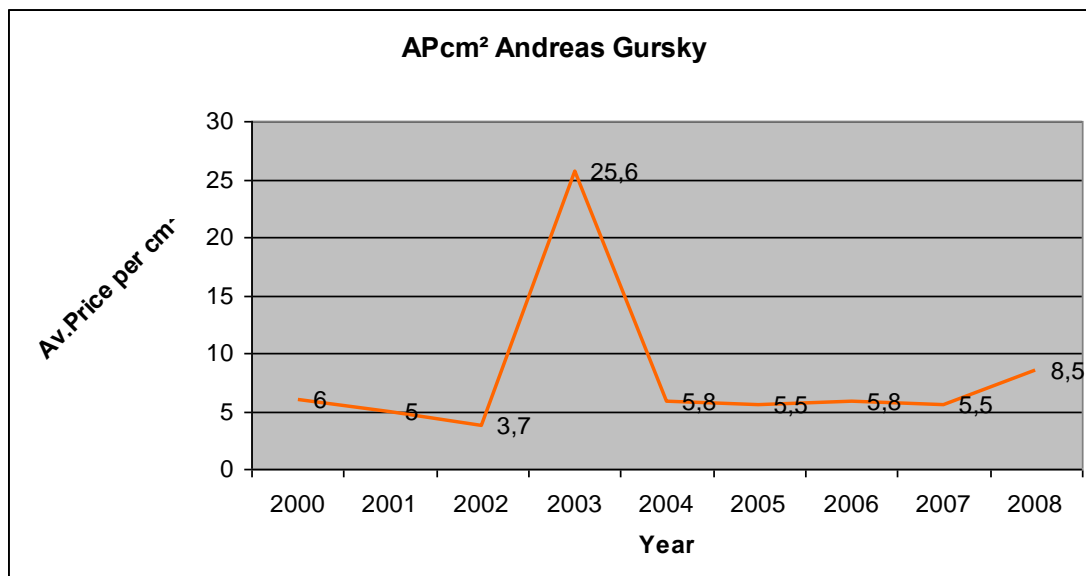
Cases time period: 1989-2009(March)

Appendix 2

Diagrams



D1.1

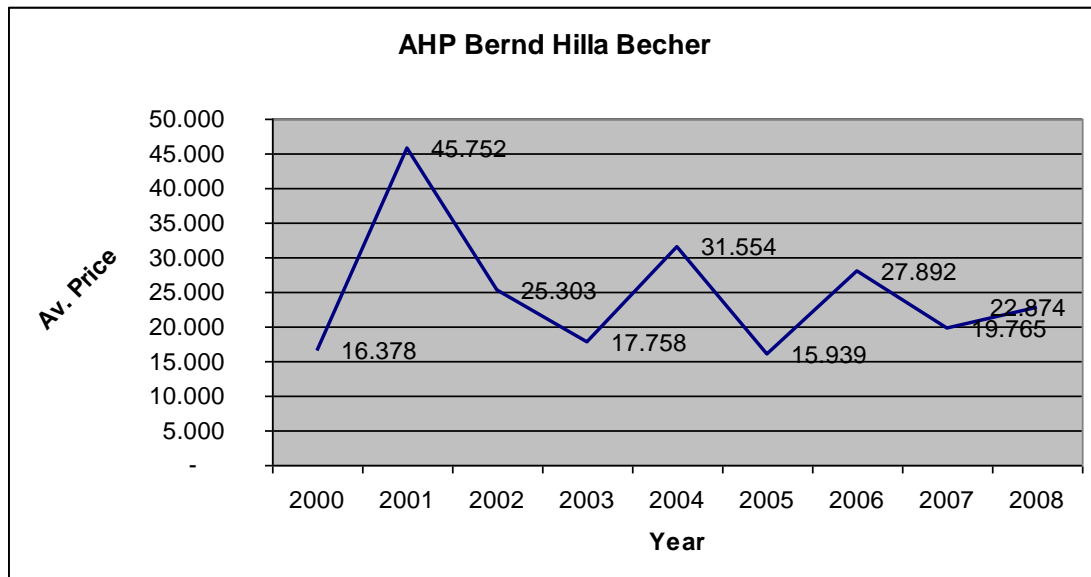


D1.2

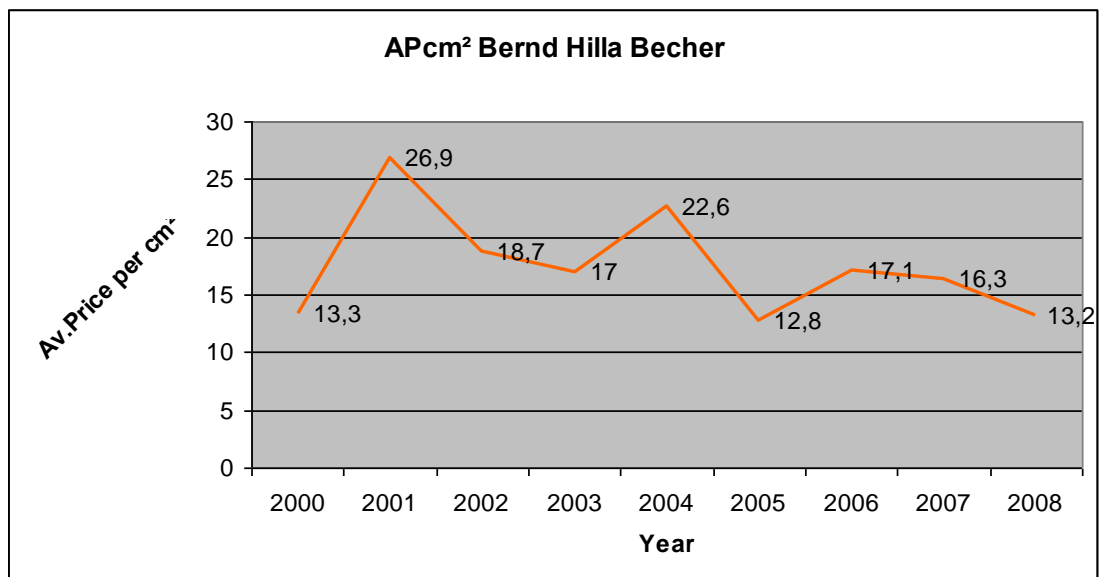
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D2.1

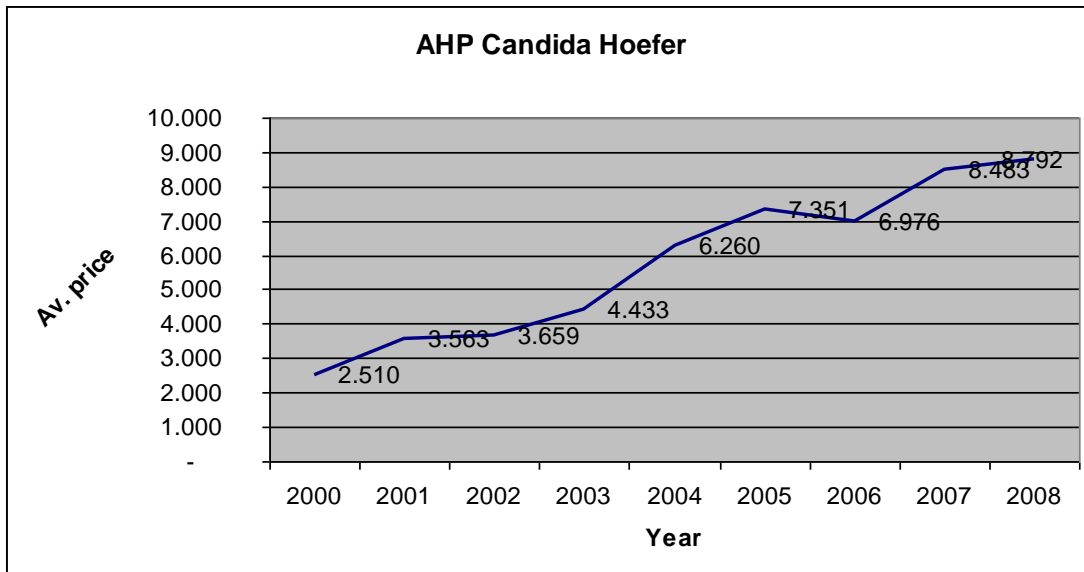


D2.2

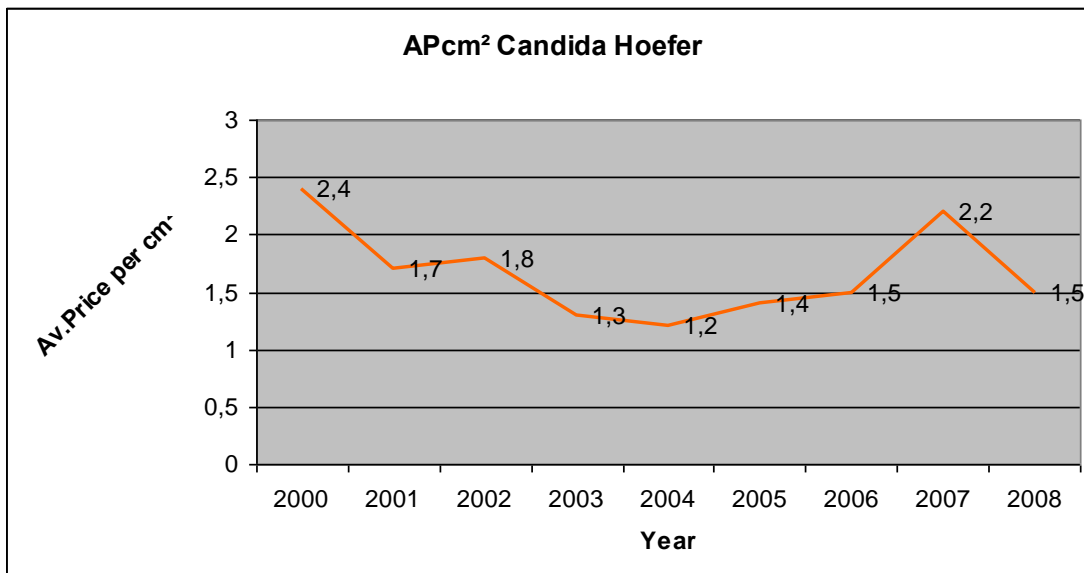
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D3.1

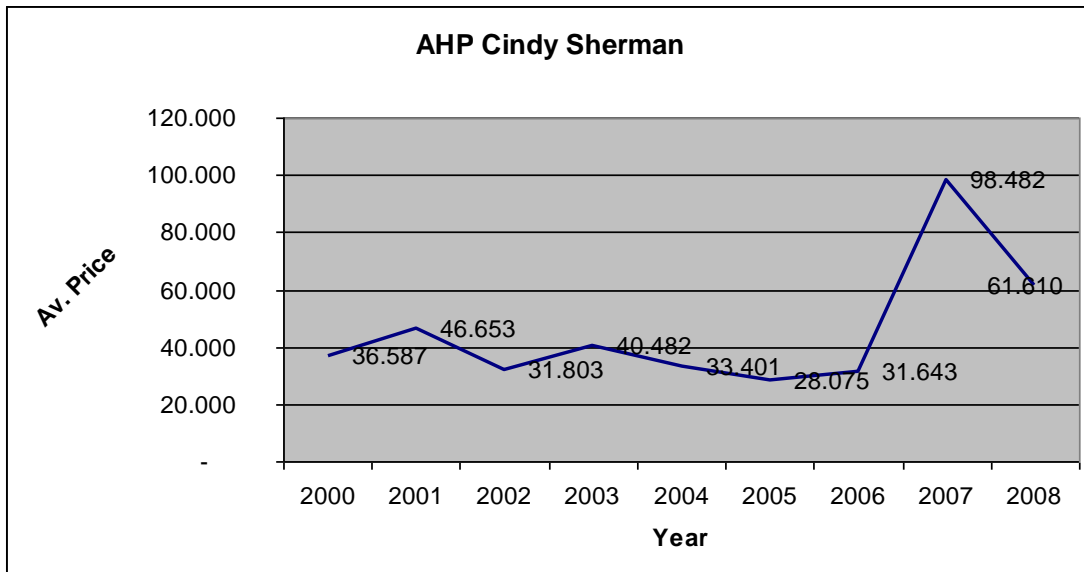


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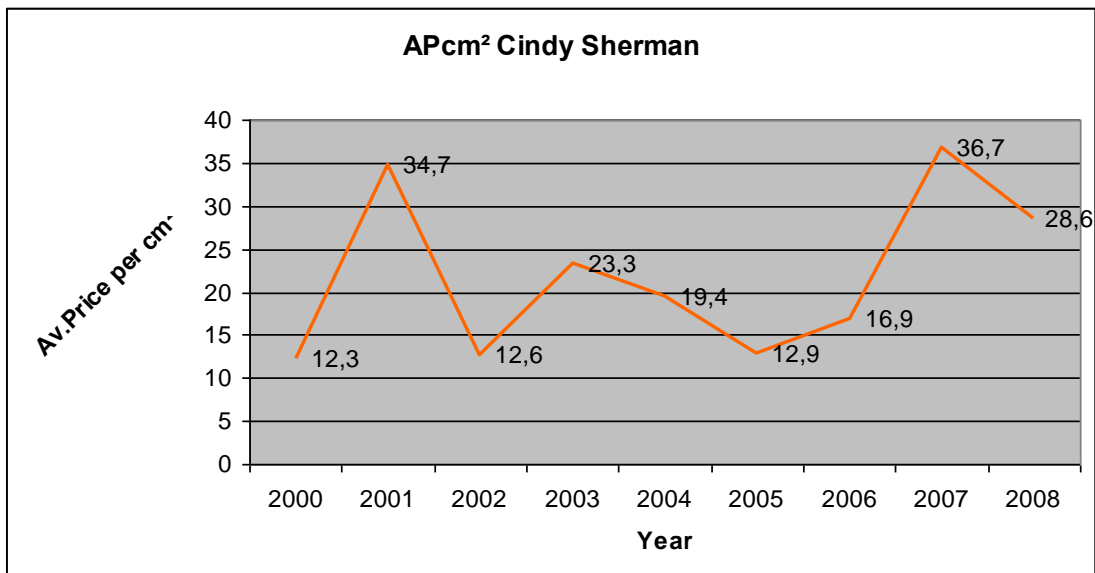
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D4.1

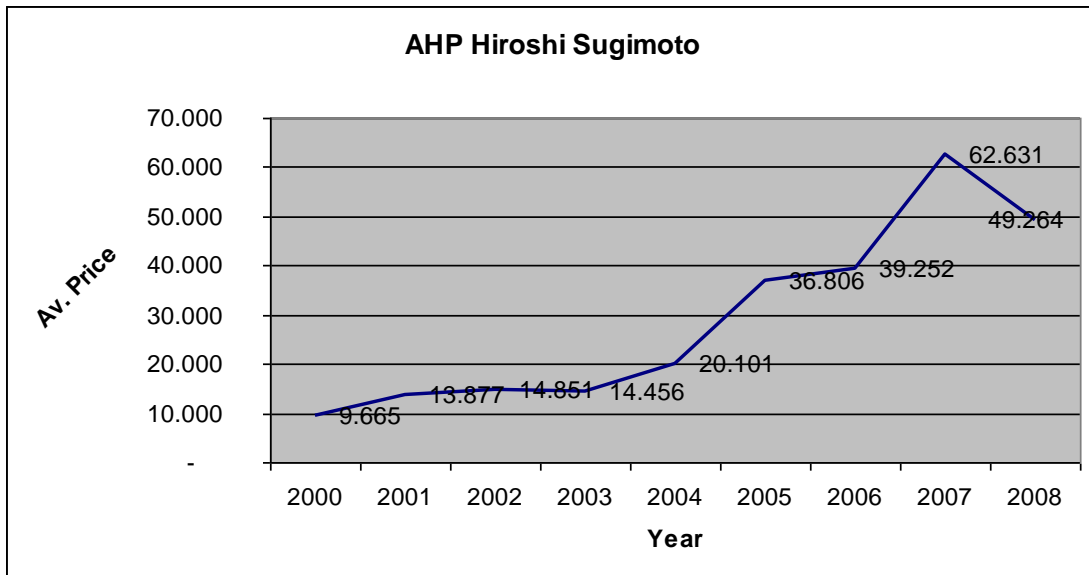


D4.2

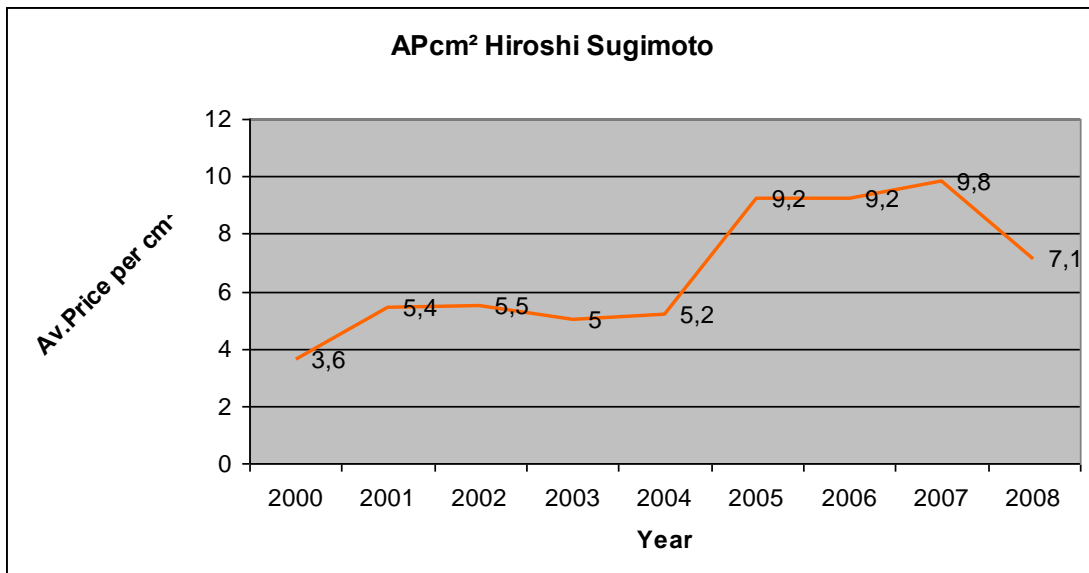
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D5.1

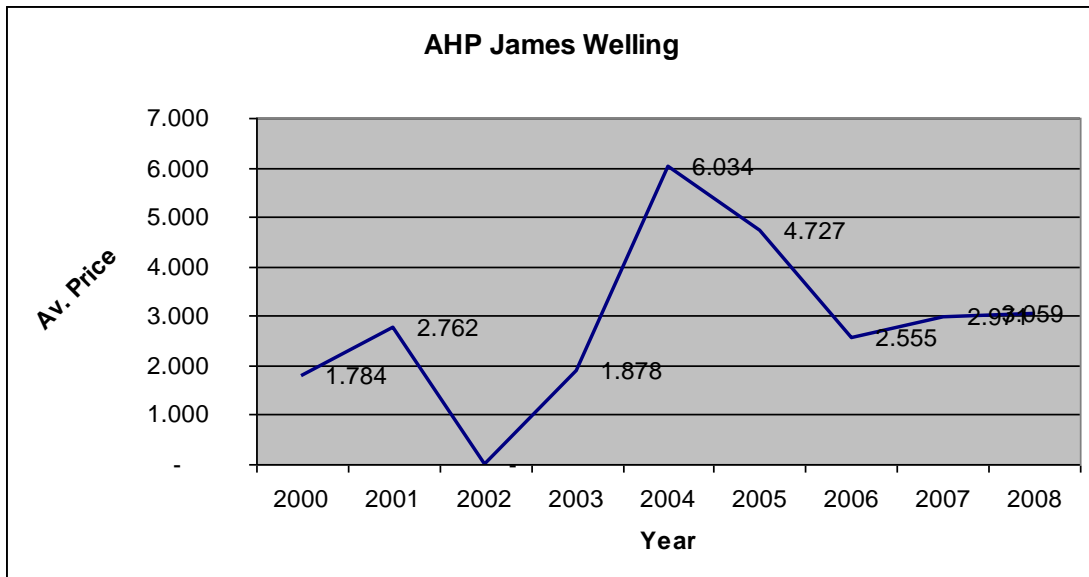


D5.2

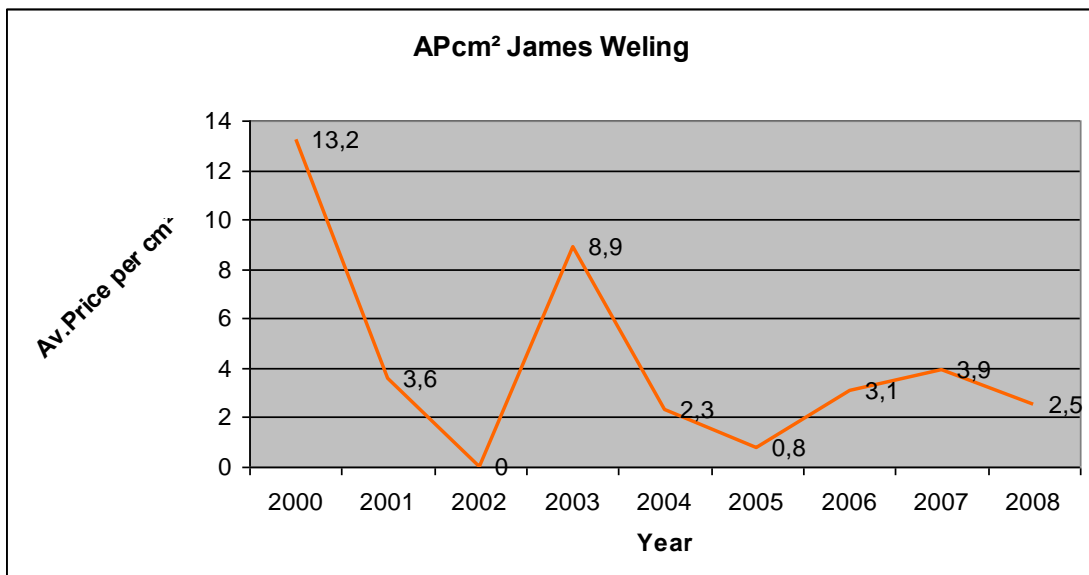
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D6.1

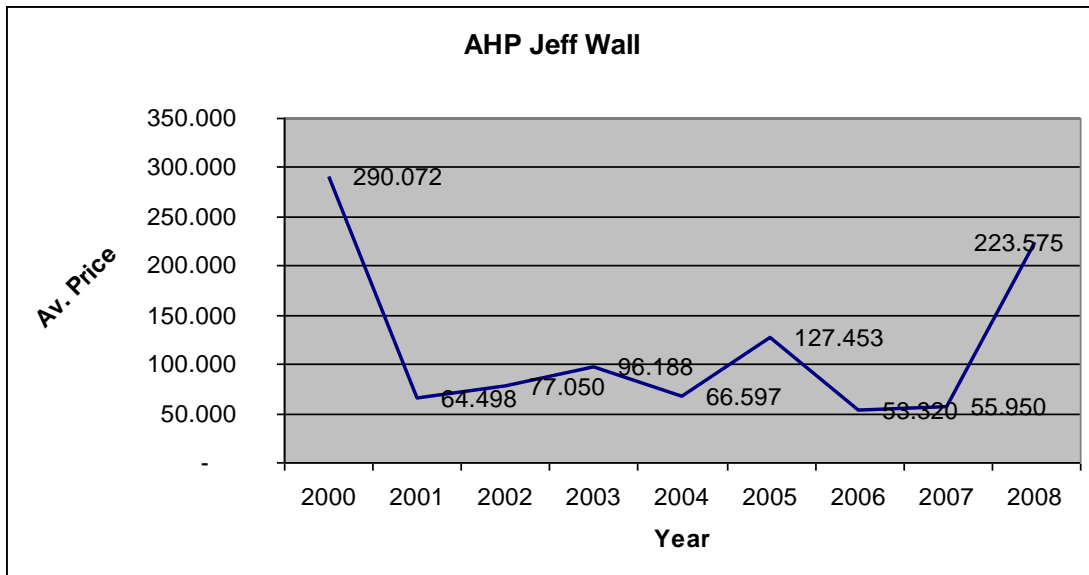


D6.2

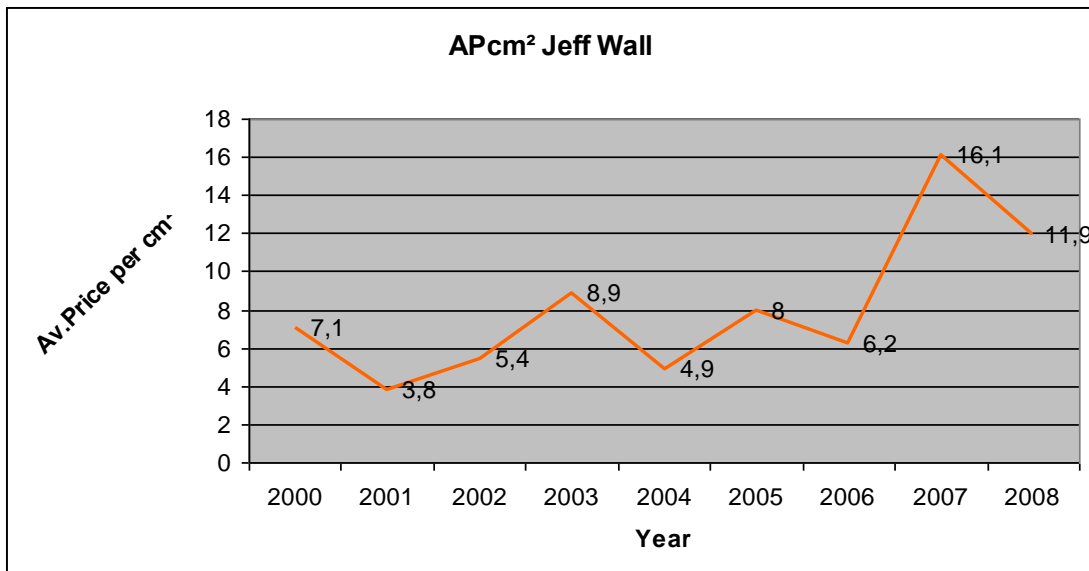
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D7.1

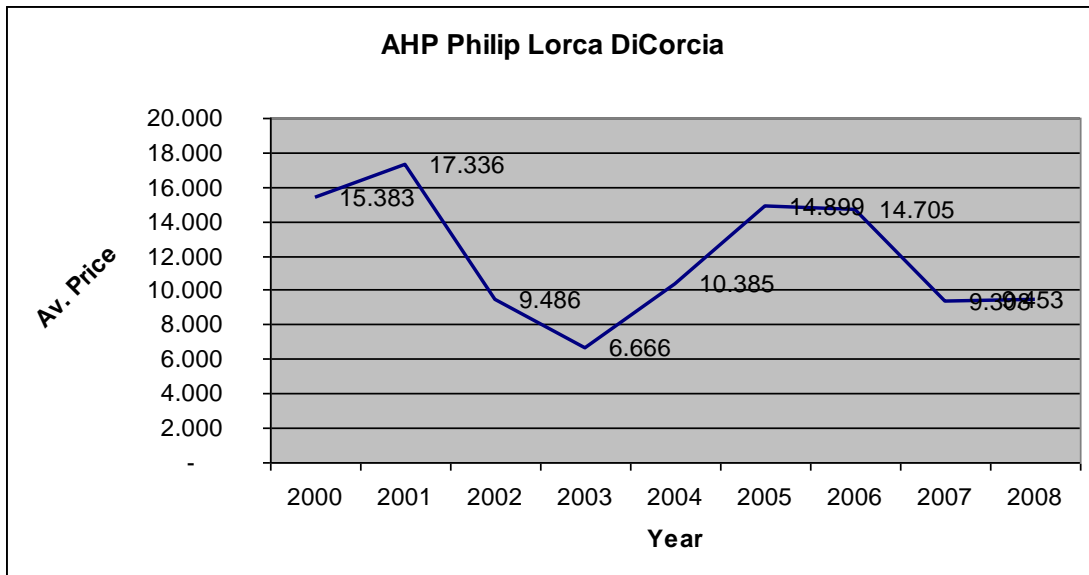


D7.2

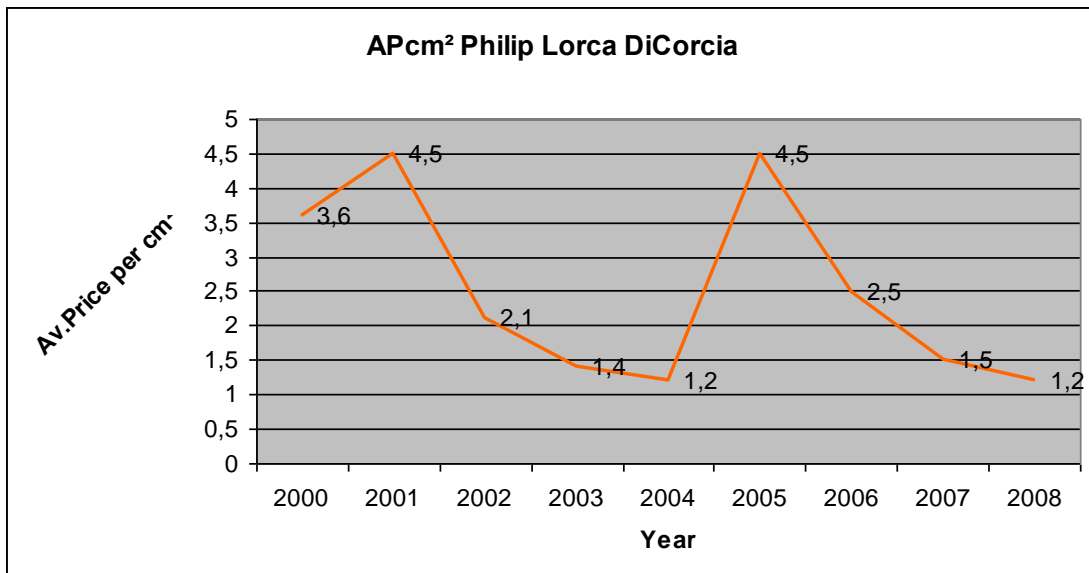
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D8.1

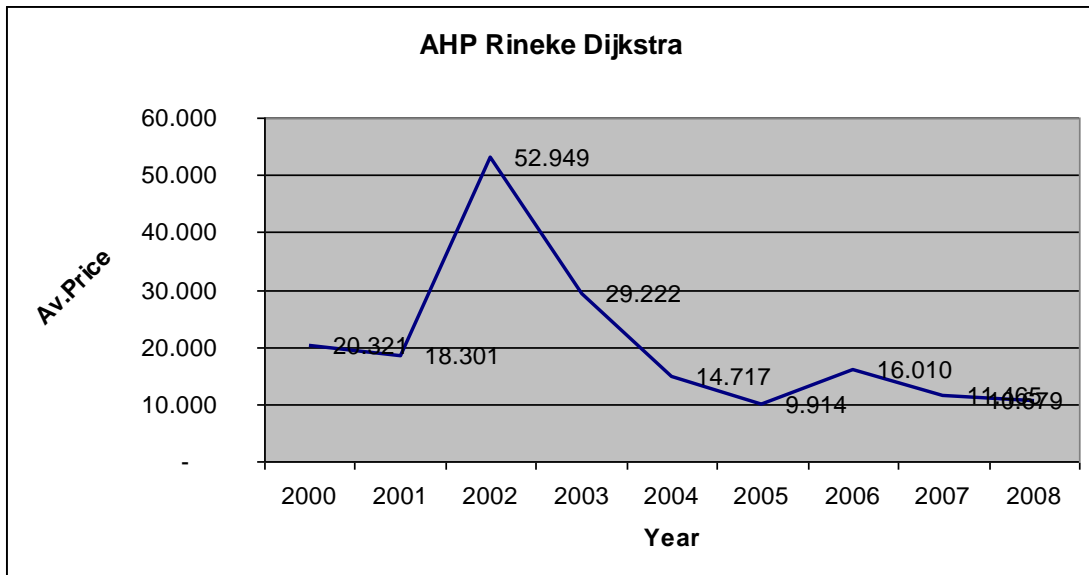


D8.2

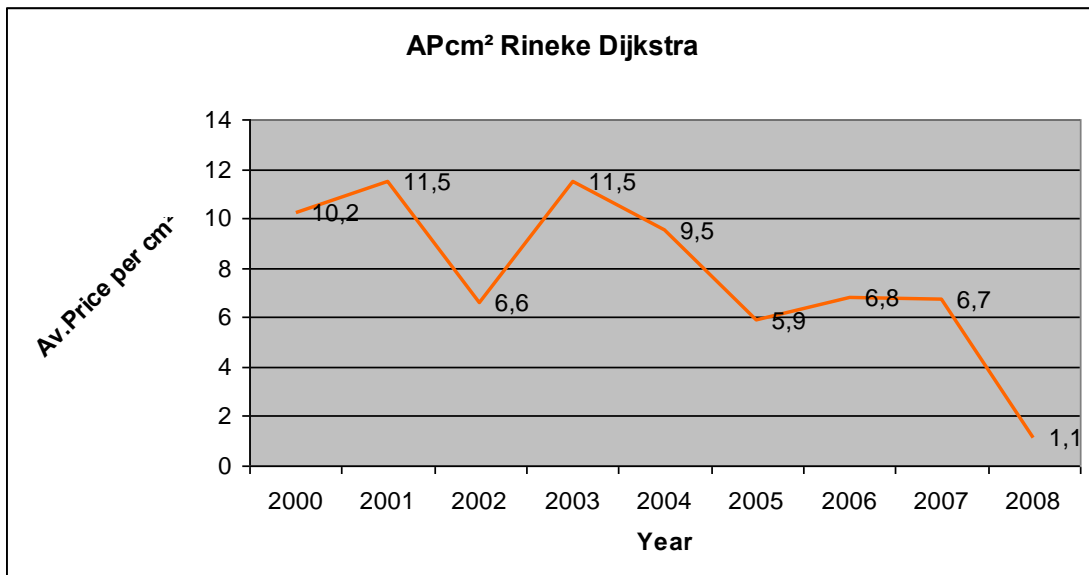
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D9.1

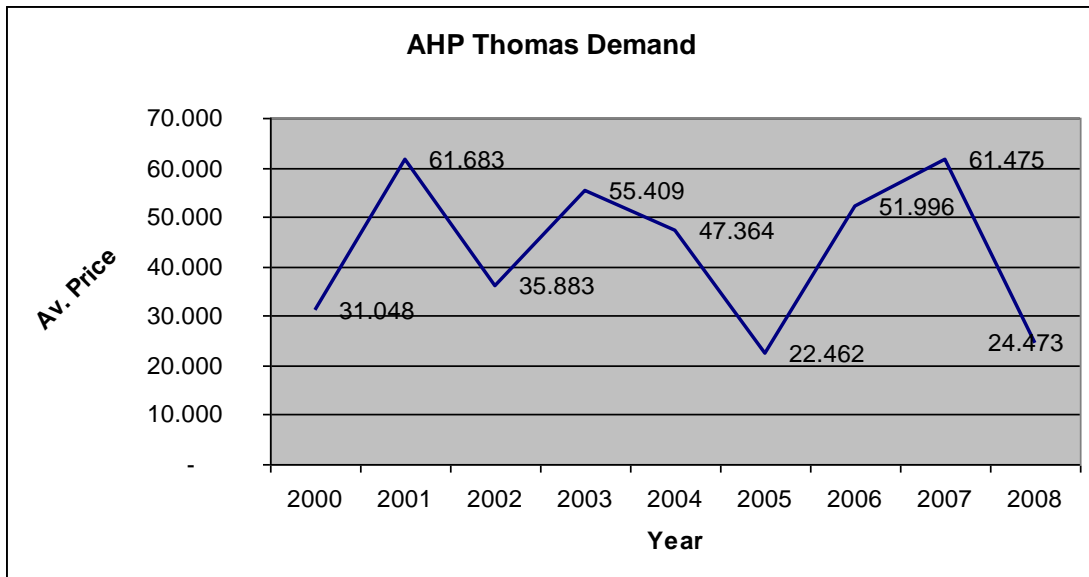


D9.2

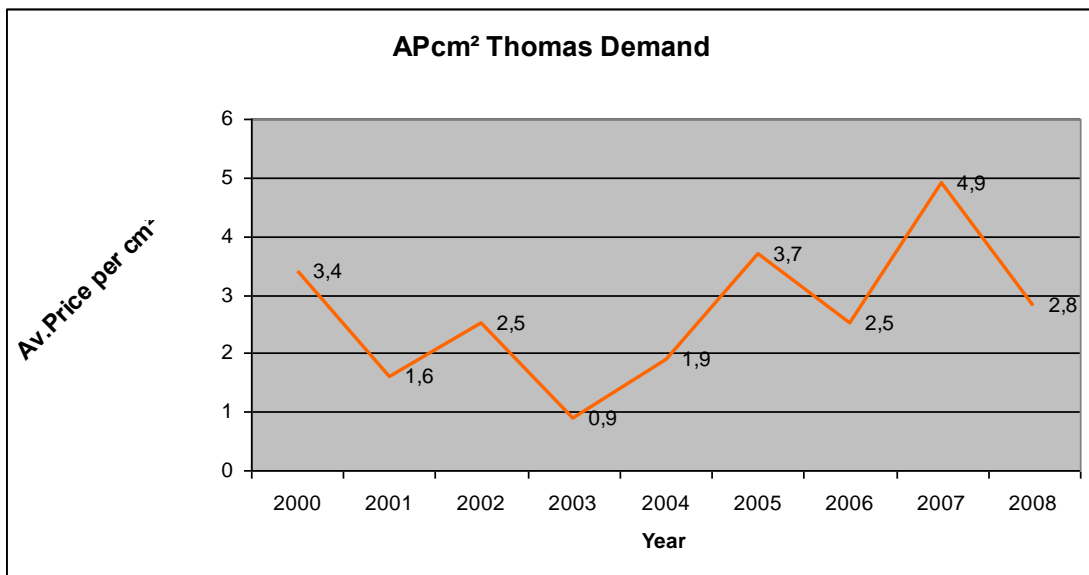
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D10.1

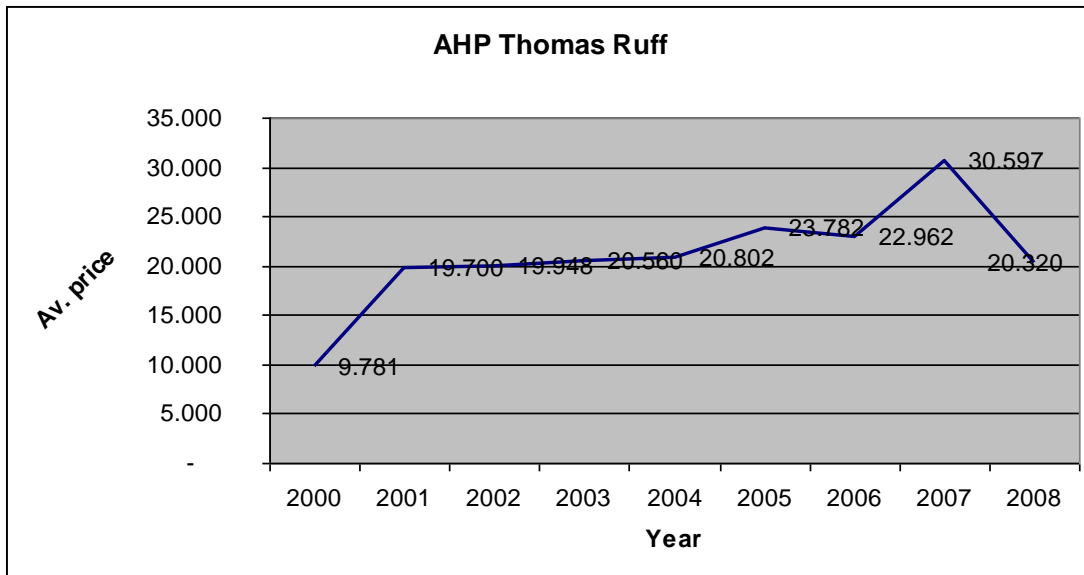


D10.2

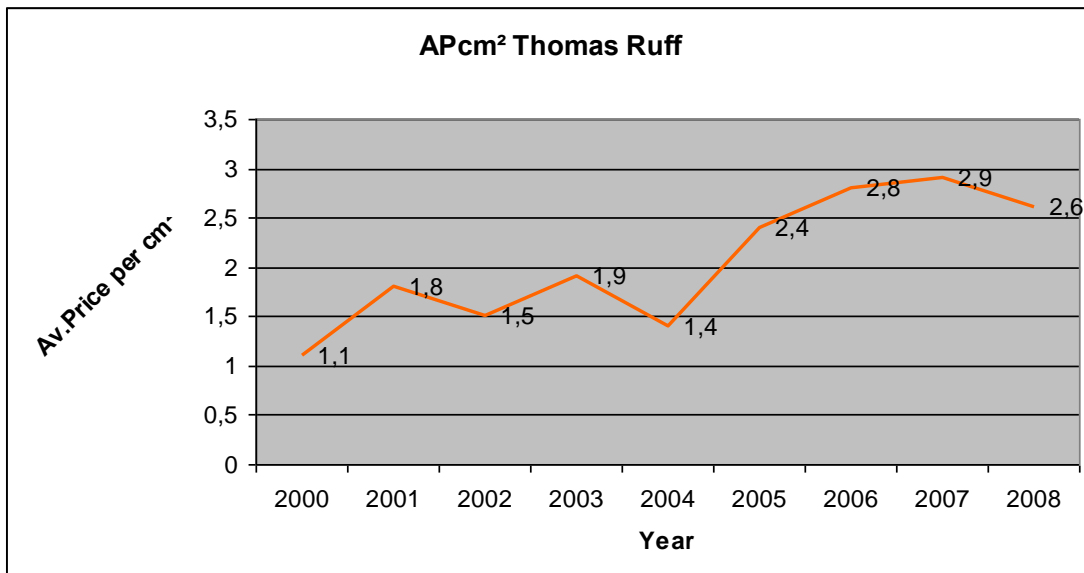
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D11.1

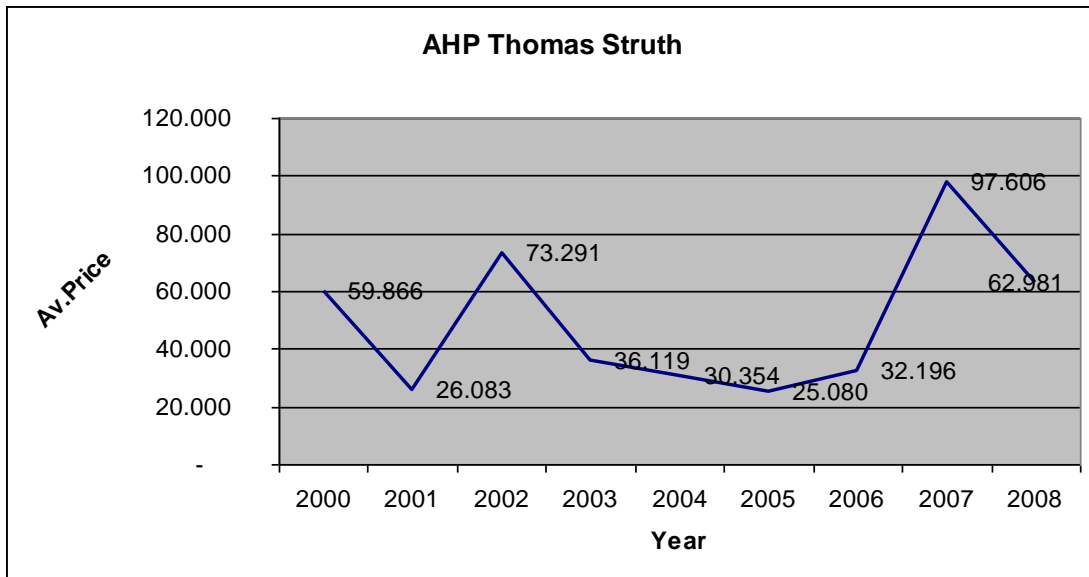


D11.2

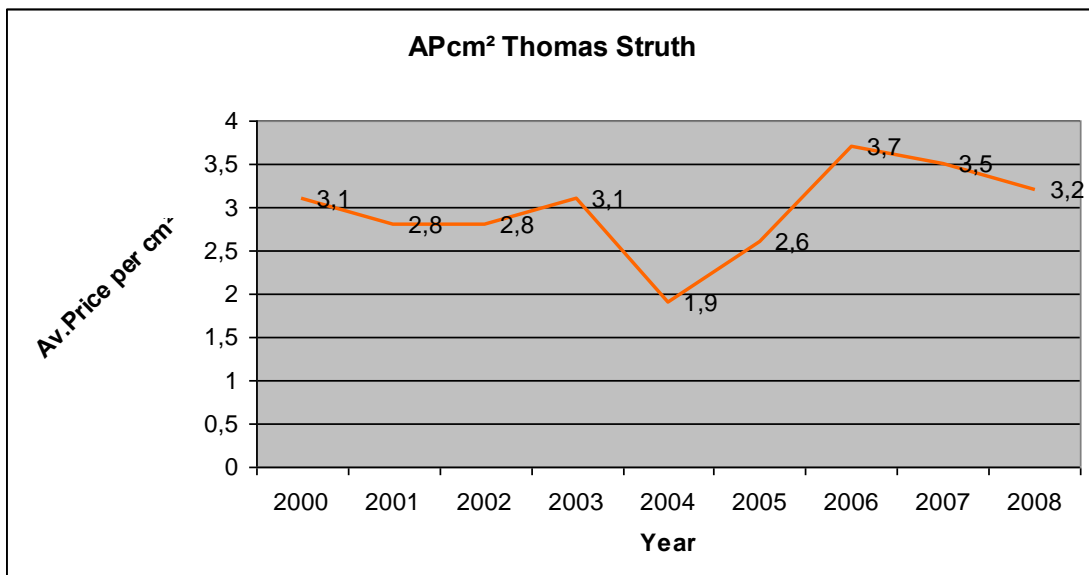
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D12.1

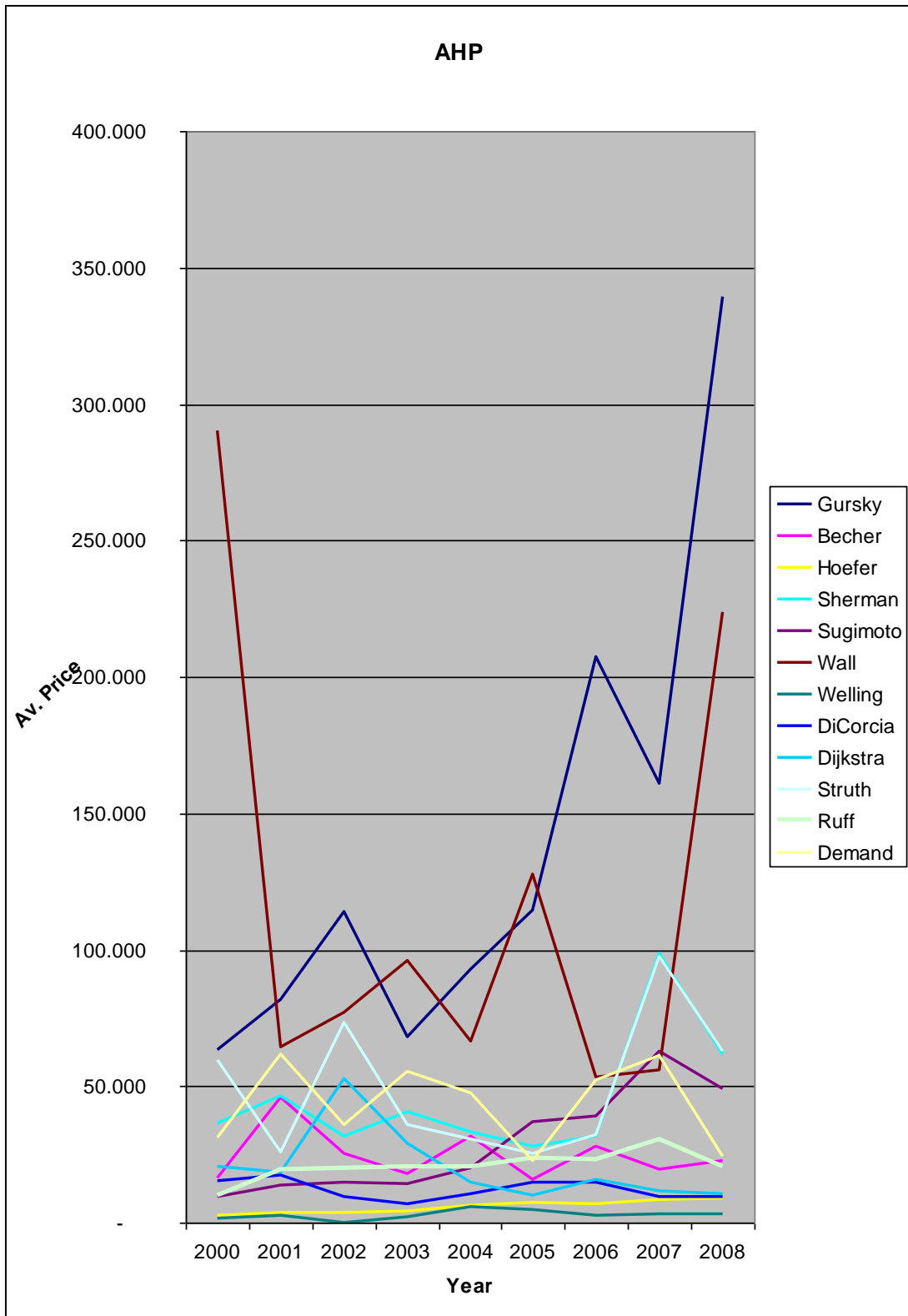


D12.2

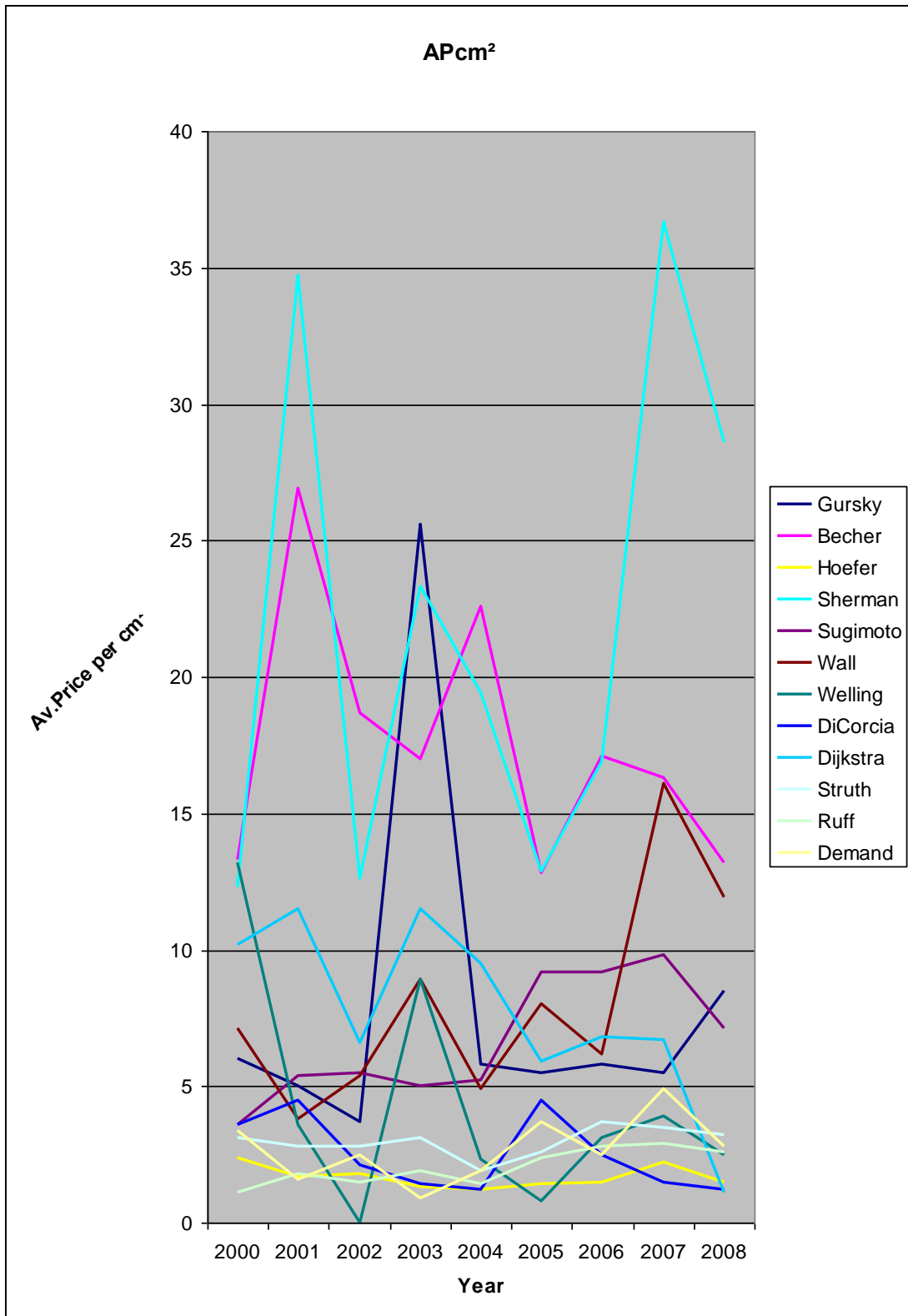
AHP stands for Average Hammer Price per year of transactions.

APcm² stands for Average Price per cm² per year of transactions.

All prices are in euros with base year 1997



D0.1



D0.2

Appendix 3

Tables

Gursky		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold in euros	26	5,292	278,469	63,531	78,001
	Price per cm2		0.91	8.80	3.73	2.03
2001	Price sold in euros	36	2,352	612,372	81,766	131,044
	Price per cm2		1.22	17.75	5.95	3.33
2002	Price sold in euros	23	3,400	635,263	113,817	141,916
	Price per cm2		1.06	10.19	5.03	2.69
2003	Price sold in euros	30	3,000	364,854	68,022	100,530
	Price per cm2		0.99	8.11	3.68	1.91
2004	Price sold in euros	25	3,400	337,160	92,724	99,707
	Price per cm2		0.73	571.83	26.64	113.62
2005	Price sold in euros	32	3,000	428,340	114,482	119,989
	Price per cm2		0.78	50.16	5.85	8.61
2006	Price sold in euros	39	4,200	1,716,000	204,070	362,074
	Price per cm2		0.82	24.46	5.76	5.66
2007	Price sold in euros	30	3,988	2,277,000	161,123	412,448
	Price per cm2		1.07	32.41	5.75	7.26
2008	Price sold in euros	16	7,000	1,724,580	339,570	448,542
	Price per cm2		1.00	34.24	8.48	8.82

T1

Becher		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold in euros	11	3,170	78,269	16,378	21,161
	Price per cm2		2.19	47.15	13.34	12.74
2001	Price sold in euros	12	1,227	158,763	45,752	50,374
	Price per cm2		.55	75.13	26.93	28.12
2002	Price sold in euros	14	1,800	74,505	25,303	23,283
	Price per cm2		1.52	61.07	18.67	19.89
2003	Price sold in euros	18	2,000	71,373	17,758	18,598
	Price per cm2		1.40	57.25	16.98	18.20
2004	Price sold in euros	25	498	126,060	31,554	33,427
	Price per cm2		.56	92.80	22.62	25.16
2005	Price sold in euros	20	667	104,623	15,939	24,373
	Price per cm2		1.49	74.61	12.77	17.49
2006	Price sold in euros	22	633	87,426	27,892	29,940
	Price per cm2		1.01	60.21	17.08	19.00
2007	Price sold in euros	22	1,500	82,308	19,765	21,702
	Price per cm2		2.45	66.47	16.32	16.91
2008	Price sold in euros	28	950	155,280	22,874	36,562
	Price per cm2		.22	75.29	13.17	18.63

T2

Höfer		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	16	237	13,562	2,510	3,619
	Price per cm2		.19	17.09	2.44	4.28
2001	Price sold	18	511	10,811	3,563	3,236
	Price per cm2		.37	4.50	1.73	1.17
2002	Price sold	21	700	13,297	3,659	3,487
	Price per cm2		.50	2.64	1.76	.56
2003	Price sold	21	305	11,315	4,433	2,944
	Price per cm2		.22	2.87	1.26	.80
2004	Price sold	30	562	27,461	6,260	6,877
	Price per cm2		.37	2.55	1.16	.55
2005	Price sold	42	355	46,695	7,351	8,949
	Price per cm2		.32	4.51	1.43	.90
2006	Price sold	69	251	59,820	6,976	9,966
	Price per cm2		.25	8.26	1.50	1.18
2007	Price sold	46	339	78,400	8,483	13,742
	Price per cm2		.32	14.68	2.17	2.29
2008	Price sold	44	450	55,440	8,792	13,145
	Price per cm2		.16	4.60	1.55	.77

T3

Sherman		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	70	454	267,954	36,587	54,307
	Price per cm2		.32	182.01	12.34	27.52
2001	Price sold	36	818	336,022	46,653	66,535
	Price per cm2		.04	658.87	34.72	110.35
2002	Price sold	24	600	131,688	31,803	42,844
	Price per cm2		.19	95.79	12.56	20.85
2003	Price sold	37	600	152,023	40,482	42,409
	Price per cm2		.41	290.81	23.27	51.87
2004	Price sold	58	681	323,862	33,401	54,718
	Price per cm2		.33	122.63	19.39	29.31
2005	Price sold	71	495	282,414	28,075	55,528
	Price per cm2		.13	242.38	12.92	33.16
2006	Price sold	69	500	452,400	31,643	63,034
	Price per cm2		.18	178.57	16.86	33.91
2007	Price sold	64	475	1,364,930	98,482	195,655
	Price per cm2		.13	348.58	36.68	72.52
2008	Price sold	64	432	525,375	61,610	108,713
	Price per cm2		.19	407.00	28.60	66.55

T4

Sugimoto		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	37	2,189	21,244	9,665	4,321
	Price per cm2		1.59	8.55	3.62	1.59
2001	Price sold	41	4,293	45,924	13,877	9,131
	Price per cm2		1.64	15.70	5.44	3.44
2002	Price sold	49	5,000	38,784	14,851	7,094
	Price per cm2		2.05	11.19	5.49	2.25
2003	Price sold	44	4,710	46,272	14,456	8,412
	Price per cm2		2.19	11.95	4.98	2.50
2004	Price sold	62	3,097	139,572	20,101	21,980
	Price per cm2		1.00	10.76	5.24	2.14
2005	Price sold	62	1,351	551,850	36,806	71,400
	Price per cm2		.60	53.22	9.20	8.06
2006	Price sold	118	1,024	489,786	39,252	66,264
	Price per cm2		.32	46.93	9.21	6.01
2007	Price sold	102	1,104	1,217,370	62,631	151,924
	Price per cm2		1.01	69.58	9.79	7.96
2008	Price sold	81	1,122	682,560	49,264	112,632
	Price per cm2		.51	29.61	7.07	5.28

T5

Welling		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	1	1,784	1,784	1,784	.
	Price per cm2		13.21	13.21	13.21	.
2001	Price sold	3	546	6,649	2,762	3,377
	Price per cm2		1.55	5.84	3.56	2.16
2002	Price sold	0				
	Price per cm2					
2003	Price sold	2	1,584	2,171	1,878	415
	Price per cm2		2.23	15.48	8.86	9.36
2004	Price sold	5	410	11,615	6,034	5,348
	Price per cm2		1.01	3.75	2.27	1.36
2005	Price sold	4	2,863	8,659	4,727	2,693
	Price per cm2		.38	1.30	.82	.41
2006	Price sold	12	246	5,820	2,555	1,563
	Price per cm2		.32	23.32	3.11	6.56
2007	Price sold	5	914	5,636	2,971	1,876
	Price per cm2		.65	12.10	3.86	4.71
2008	Price sold	12	286	12,940	3,059	3,455
	Price per cm2		.48	9.47	2.50	3.08

T6

Wall		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	1	290,072	290,072	290,072	.
	Price per cm2		7.08	7.08	7.08	.
2001	Price sold	6	632	145,610	64,498	56,840
	Price per cm2		.49	7.05	3.84	2.52
2002	Price sold	1	77,050	77,050	77,050	.
	Price per cm2		5.39	5.39	5.39	.
2003	Price sold	3	52,122	156,366	96,188	53,957
	Price per cm2		2.30	18.68	8.86	8.66
2004	Price sold	4	1,092	177,353	66,597	83,659
	Price per cm2		2.35	10.02	4.92	3.45
2005	Price sold	2	3,272	251,634	127,453	175,618
	Price per cm2		4.68	11.27	7.98	4.66
2006	Price sold	5	1,733	152,406	53,320	61,863
	Price per cm2		3.72	10.65	6.21	3.04
2007	Price sold	5	3,571	114,960	55,950	49,806
	Price per cm2		7.54	30.06	16.11	10.47
2008	Price sold	6	1,700	682,290	223,575	308,740
	Price per cm2		1.28	38.54	11.92	14.12

T7

DiCorcia		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	10	2,611	55,694	15,383	16,081
	Price per cm2		.87	17.90	3.55	5.13
2001	Price sold	15	4,797	31,362	17,336	7,195
	Price per cm2		1.46	10.81	4.53	2.80
2002	Price sold	13	2,246	18,418	9,486	6,290
	Price per cm2		.88	5.67	2.14	1.37
2003	Price sold	21	601	16,332	6,666	3,395
	Price per cm2		.19	5.27	1.41	1.10
2004	Price sold	14	3,651	18,610	10,385	5,247
	Price per cm2		.47	2.13	1.19	.40
2005	Price sold	20	3,000	42,961	14,899	13,474
	Price per cm2		.51	25.92	4.47	6.45
2006	Price sold	31	657	47,490	14,705	10,816
	Price per cm2		.16	12.49	2.54	2.40
2007	Price sold	19	306	28,180	9,308	5,874
	Price per cm2		.54	3.90	1.45	.77
2008	Price sold	15	3,264	18,874	9,453	4,238
	Price per cm2		.58	2.11	1.25	.42

T8

Dijkstra		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	13	3,981	102,105	20,321	25,432
	Price per cm2		.84	22.49	10.22	6.93
2001	Price sold	15	1,452	102,062	18,301	26,209
	Price per cm2		1.39	35.42	11.47	11.44
2002	Price sold	16	2,500	395,064	52,949	95,409
	Price per cm2		1.63	13.33	6.61	4.00
2003	Price sold	12	1,633	138,992	29,222	37,447
	Price per cm2		.64	35.25	11.46	12.03
2004	Price sold	9	4,000	29,617	14,717	8,829
	Price per cm2		.91	22.85	9.53	8.36
2005	Price sold	14	1,700	21,111	9,914	5,467
	Price per cm2		.46	17.66	5.90	5.91
2006	Price sold	21	903	48,000	16,010	12,953
	Price per cm2		.30	26.67	6.79	8.48
2007	Price sold	14	670	23,251	11,465	8,066
	Price per cm2		.56	21.28	6.69	7.20
2008	Price sold	9	628	32,016	10,679	9,708
	Price per cm2		.44	2.09	1.10	.58

T9

Demand		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	2	16,457	32,488	24,473	11,336
	Price per cm2		1.20	5.54	3.37	3.07
2001	Price sold	8	39,975	95,206	61,475	19,094
	Price per cm2		1.00	3.16	1.58	.78
2002	Price sold	11	8,933	131,688	51,966	36,375
	Price per cm2		1.34	4.60	2.53	.94
2003	Price sold	5	750	79,530	22,462	34,363
	Price per cm2		.25	1.52	.89	.45
2004	Price sold	6	1,079	75,933	47,364	26,074
	Price per cm2		.99	3.52	1.89	1.03
2005	Price sold	15	1,771	116,550	55,409	43,091
	Price per cm2		.44	14.36	3.69	3.92
2006	Price sold	26	633	174,130	35,833	50,203
	Price per cm2		.30	7.05	2.48	1.75
2007	Price sold	16	1,357	129,166	61,683	42,739
	Price per cm2		1.28	30.70	4.95	7.06
2008	Price sold	11	767	160,000	31,048	48,548
	Price per cm2		.66	11.26	2.78	2.96

T10

Ruff		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	53	716	83,859	9,781	16,226
	Price per cm2		.31	4.61	1.12	.82
2001	Price sold	58	762	111,929	19,700	30,498
	Price per cm2		.24	6.89	1.84	1.49
2002	Price sold	37	700	81,444	19,948	24,822
	Price per cm2		.20	9.94	1.47	1.70
2003	Price sold	33	1,102	62,546	20,560	19,897
	Price per cm2		.11	8.62	1.87	1.51
2004	Price sold	71	374	78,979	20,802	19,060
	Price per cm2		.22	7.66	1.45	1.13
2005	Price sold	69	700	97,638	23,782	21,516
	Price per cm2		.23	18.92	2.42	3.03
2006	Price sold	88	720	101,751	22,962	27,334
	Price per cm2		.22	15.74	2.85	2.64
2007	Price sold	74	1,086	106,183	30,597	31,050
	Price per cm2		.46	14.39	2.87	2.38
2008	Price sold	74	255	91,840	20,320	25,395
	Price per cm2		.15	12.70	2.57	2.54

T11

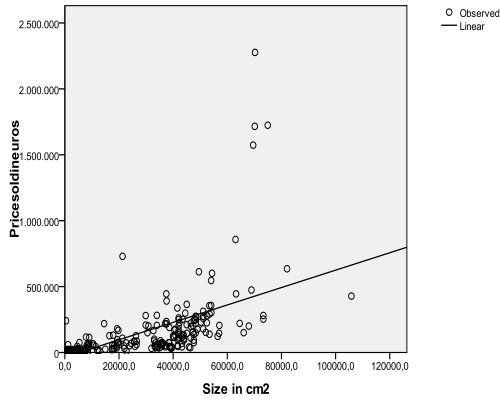
Struth		N	Minimum	Maximum	Mean	Std. Deviation
2000	Price sold	37	1,841	266,604	59,866	73,429
	Price per cm2		.78	8.58	3.06	1.78
2001	Price sold	35	1,125	170,103	26,083	43,055
	Price per cm2		.72	6.27	2.77	1.43
2002	Price sold	25	1,800	307,272	73,291	88,780
	Price per cm2		.70	6.91	2.77	1.75
2003	Price sold	34	500	316,206	36,119	63,096
	Price per cm2		.92	11.87	3.07	2.59
2004	Price sold	44	2,162	177,009	30,354	38,997
	Price per cm2		.56	10.44	1.94	1.72
2005	Price sold	48	800	207,228	25,080	40,776
	Price per cm2		.50	10.10	2.59	2.00
2006	Price sold	59	493	340,929	32,196	65,360
	Price per cm2		.36	54.91	3.74	7.21
2007	Price sold	39	1,057	616,230	97,606	155,782
	Price per cm2		.56	14.04	3.51	3.55
2008	Price sold	31	948	491,720	62,981	124,991
	Price per cm2		.39	23.28	3.18	4.89

T12

Appendix 4

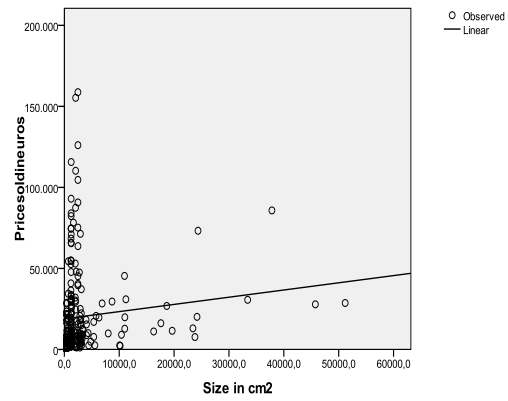
Scatterplots

Photographer: Andreas Gursky



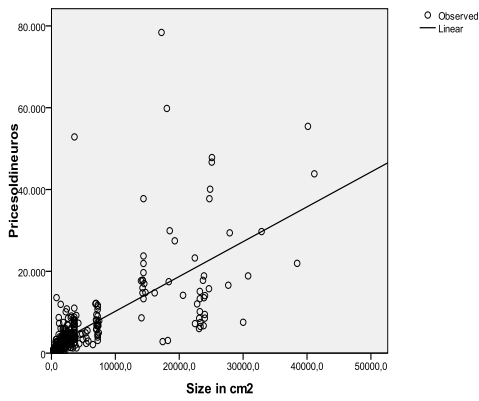
SC1

Photographer: Bernd Hillja Becher



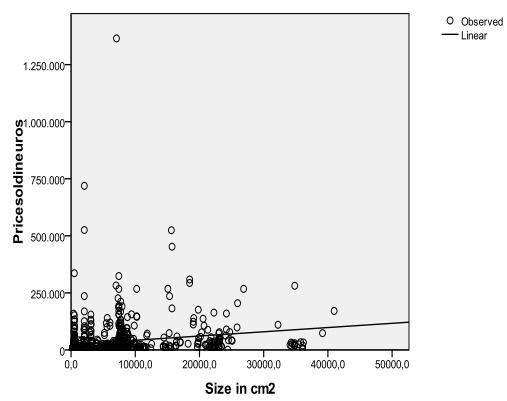
SC2

Photographer: Candida Höfer



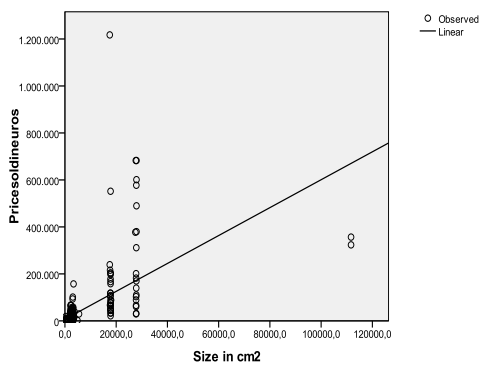
SC3

Photographer: Cindy Sherman



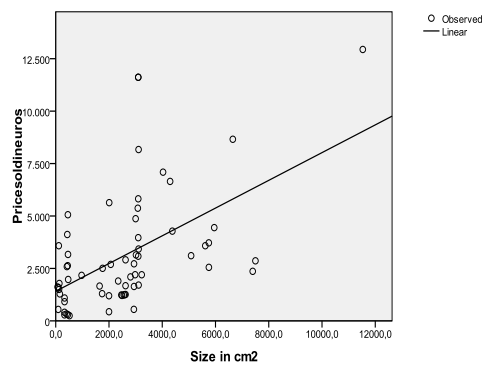
SC4

Photographer: Hiroshi Sugimoto



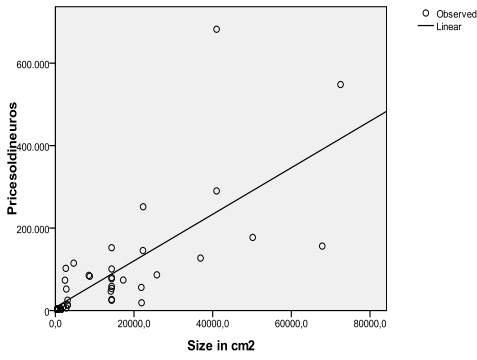
SC5

Photographer: James Welling



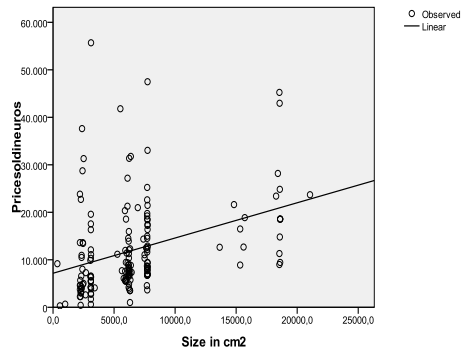
SC6

Photographer: Jeff Wall



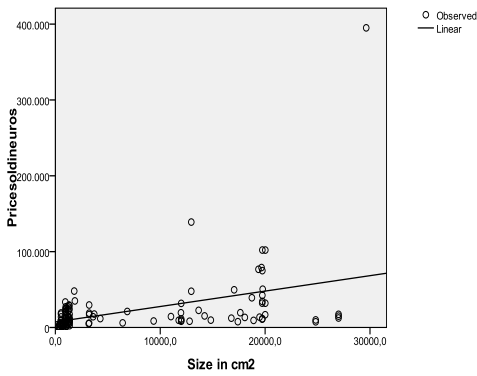
SC7

Photographer: Philip Lorca DiCorcia



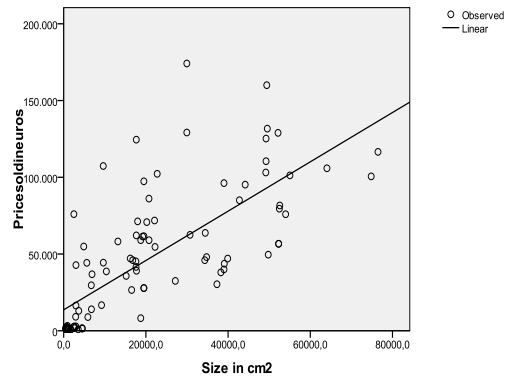
SC8

Photographer: Rineke Dijkstra



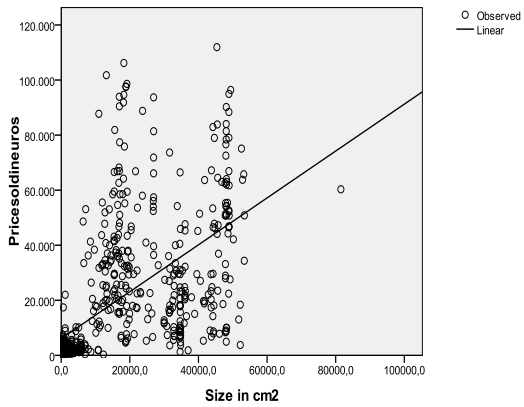
SC9

Photographer: Thomas Demand



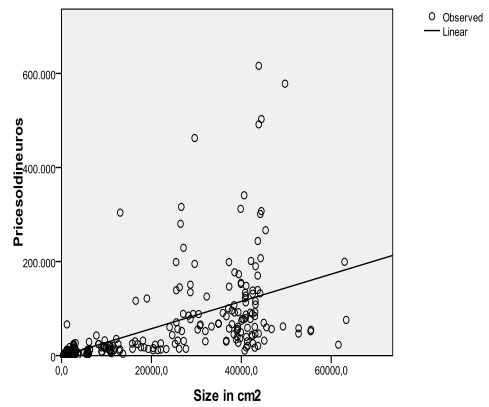
SC10

Photographer: Thomas Ruff



SC11

Photographer: Thomas Struth



SC12