UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

Faculty of Business
Administration and Economics

Anomalies in Fine Art Markets - Three Examples of an Imperfect Market for Perfect Goods

A thesis submitted to the

University of Paderborn
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December 3rd, 2007

Abstract

Based on the research conducted in the fields of cultural economics and economics of the visual arts, this thesis focuses on three special anomalies in the market for fine arts. After a short introduction to the history of research on the economics of the visual arts in chapter 1, chapter 2 sets out the basic requirements for further analysis, namely the foundations of art markets, the characteristics of art as a good, market structures and actors, as well and the driving forces of supply and demand and the resulting pricing mechanisms. Special attention is drawn in chapter 3 to the data used for analysis, which is artist data from Artcyclopedia, auction price data from Hislop's Art Sales Index and Artprice.com, gallery price and reputation data from the Capital Kunstkompass, and popularity data taken from the number of total hits registered by the Google search engine. Next, in chapter 4, the three anomalies are analyzed. The three topics are 1) a comparison of pricing strategies in dealer and auction markets, 2) the effects of an artist's death on appreciation of his/her works (called "death-effects") and 3) artists and superstardom. Lastly, the conclusion in chapter 5 summarises the results presented in chapter 4 and indicates possible future research topics.

The thesis presented here is original as regards the way in which the anomalies are analyzed. Data is utilised which has never before been employed in this context, in this depth and in this combination. Furthermore, the anomalies described here have previously been described only scantly, if at all, in the context of economics of the visual arts. Owing to these special features, the thesis has broadened the research agenda and created new impulses for further research. For outsiders, the strange behaviour of the art market is partly explained from the point of view of an economist.

Zusammenfassung

Basierend auf der Forschung für Kulturökonomik bzw. die Ökonomie der Bildenden Künste zeigt diese Dissertation drei spezielle Anomalien in Märkten für Bildende Kunst auf. Nachdem eine kurze Einleitung die bisherigen Forschungsergebnisse im Bereich der Ökonomie der Bildenden Künste in Kapitel 1 darstellt, werden zuerst die Grundlagen der Forschung im zweiten Kapitel erklärt: Dies umfasst die Eigenschaften von Kunst als ökonomisches Gut, die Marktstrukturen und Akteure, die treibenden Kräfte von Angebot und Nachfrage sowie die daraus resultierenden Preisbildungsmechanismen. Danach werden in Kapitel 3 die verwendeten Datenquellen näher erläutert. Dies sind Artcyclopedia für Künstlerinformationen, Auktionsdaten von Hislop's Art Sales Index sowie Artprice.com, Galeriepreisdaten und Reputation vom Capital Kunstkompass sowie Popularitätsdaten in Form der Gesamtanzahl von Treffern bei Google. Als nächstes werden dann die drei Anomalien in Kapitel 4 näher analysiert. Die drei Themen sind 1) ein Vergleich zwischen Preissetzungsstrategien bei Galerie- und Auktionsmärkten, 2) Todeseffekte bei Künstlern und 3) Künstler als Superstars. Die Zusammenfassung in Kapitel 5 fasst die Ergebnisse zusammen und zeigt mögliche Wege für weitere Forschungen auf.

Die hier präsentierte Dissertation ist im Hinblick auf die Art und Weise wie die drei Anomalien analysiert werden besonders: Es werden spezielle Daten in neuen Kombinationsweisen verwendet, was in diesem Kontext noch nie zuvor getan wurde. Alle drei präsentierten Anomalien wurden bisher noch nie oder nur spärlich vor dem Hintergrund der Bildenden Künste analysiert. Aufgrund dieser Besonderheiten wird das Forschungsfeld der Ökonomie der Bildenden Künste erweitert und erhält neue Impulse für spätere Forschungen. Für Außenstehende werden die teilweise merkwürdigen Verhaltensweisen des Kunstmarktes aus der Sicht eines Ökonomen erklärt.

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CKK	Capital Kunstkompass
DEM	Currency "German Mark" valid until the end of 2001
EU	European Union
EUR	Currency "Euro" with sign €
JAVA	Programming language
NACE	"Nomenclature Generale des Activités Economiques dans I`Union Européenne" (General Nomenclature for Economic Activities in the European Union)
NAICS	North American Industry Classification System
REGEXP	Regular expression
STATA	Software for statistical calculations
SPSS	Software for statistical calculations
UKP	Currency "British Pound" with sign £
US	United States (of America)
USD	Currency "US Dollar" with sign $

Acknowledgments

The presented work is a thesis submitted to the Department of Economics and Business Administration at the University of Paderborn. Such a major project cannot develop without assistance, so I should like to thank Prof. Dr. Bernd Frick, in particular, for his invaluable guidance through the process of writing this thesis and for taking on the responsibility of giving the first opinion about my work. I should also like to express my gratitude towards the numerous academic and non-academic supporters, namely Prof. Dr. Alexander Dilger, Prof. Dr. Dr. h.c. mult. Bruno S. Frey, Prof. Dr. Michael Hutter, Prof. Dr. Michael Moses, Dr. Gunnar Pietzner, Maren Schäfer, Anke Strauß and Dr. Edgar Quadt for their guidance regarding the field of the arts and economics. They always supported me with helpful input and critical comments on my thoughts.

Last but not least, I should like to thank my parents Hans-Joachim and Barbara Knebel. They have always given me every possible form of support in my academic, professional and personal development. Also, they provided accommodation “beside the seaside” for the isolated writing sessions I needed to complete this thesis.

1. Introduction

Discussions about art and economics mostly assume that the "untouchable" sector of culture and the arts cannot be explained by reference to economic theories. Upon closer inspection, however, it becomes evident that, contrary to this assumption, a great deal of research has been done in this field.

The story began with the pioneering book "Performing Arts: The Economic Dilemma" by Baumol & Bowen (1966) who laid the foundations of cultural economics.[1] Since then several more authors, e.g. Blaug (1978), Grampp (1989), Throsby (1994) and Towse (1997), have written on this general topic and have given quite good overviews of the attempts to use economic theory in the context of culture in general and the fine arts in particular. In 1976 the academic quarterly Journal of Cultural Economics was launched, which mainly deals with this area of research:

> *"Cultural economics is the application of economic analysis to all of the creative and performing arts, the heritage and cultural industries, whether publicly or privately owned. It is concerned with the economic organization of the cultural sector and with the behaviour of producers, consumers and governments in that sector. The subject includes a range of approaches, mainstream and radical, neoclassical, welfare economics, public policy and institutional economics." (Journal of Cultural Economics)*

Over the course of time, the topics of research in cultural economics have diversified into several professional fields: basically, a distinction is drawn between performing and non-performing arts. The performing arts are separated into live and non-live performances in their various styles, e.g. music, theatre and dance. The non-performing arts are divided up into the area of the media, i.e. writing, publishing, radio, TV and the internet, and that of what are called the fine arts, e.g. painting, sculpture, graphics and so on, also called vis-

[1] Actually there was an earlier paper BAUMOL, W. J. & BOWEN, W. G. (1965) On the Performing Arts: The Anatomy of their Economic Problems. *The American Economic Review,* 55**,** 7. on which basis the book was written.

ual arts. In each of these various areas of cultural economics, distinctions are drawn between "popular" (or mass) culture and "high" (or elite) culture. The boundaries between these are fluid and change from time to time. Even in our times many of the classic domains of culture and the arts find themselves in new contexts.

The area of interest for the following discussion is mainly the economics of the fine arts[2], even if the ideas and results sometimes can be or have been adapted from other areas of cultural economics. The fine arts have also often been taken as an example for the cultural industries as a whole, since many phenomena can be shown there without the need to discuss the mechanisms of larger and more complicated branches or businesses. (Heilbrun and Gray, 2001)

"In short, the analysis of (fine) art markets by economists seems finally to be showing real promise as a genuine branch of cultural economics per se." (Blaug, 2001)

1.1. Founders, Followers and Specializing Research

Singer & Lynch (1997) present a framework within which they distinguish three phases of the development of a major art movement. I will use this methodology to classify the state of research in the economics of the visual arts, as Frey (1997) has done. At first there are the "founders", then come the "followers of significant achievement" and then research is done "essentially following the main stream (art) movements". In the following I will extend Frey's comments on the state of research.

The history of the founders of research in the visual arts is easy to relate. Rush (1961) was the first to publish a book on this subject, the title of which was "Art as an investment: Hot to buy and sell works of art for profit and pleasure - an analysis of the art market and collector's guide". This work presented at least some thoughts on the combination of the fine arts and economics, along with his main intention, which was to educate the future collector by passing on his personal insights from the art world. Next, Wagenführ (1965) explicitly published research about the economics of the fine

arts, namely art prices and rates of return. Unfortunately, his publication was written in German and so it never attracted a great deal of attention. Then Keen (1971) wrote a book on the Times-Sotheby Art Price Index in which he attempted to give an overview of art schools and their price developments between 1951 and 1969. In the more academic field, Anderson (1974), Stein (1977) and Schneider & Pommerehne (1983) contributed journal articles on the subject of the financial returns of auctioned paintings, but the topic was not broadly accepted and recognized until after Baumol (1986) published his study "Unnatural Value: Or Art Investment as Floating Crap Game" in the American Economic Review. Today this is known as the start of a research subject which has since become well diversified and is of interest to many economic researchers who wish to apply their theories to an area associated with the senses and emotions and has a cultural touch.

After these founders of the research area, the followers came in the second phase. The followers of Baumol's study all go beyond him and add content in special ways. This trend started in the early 1990s, when numerous articles were published about art as an investment (see chapter 1.2 below for more details) and the according rate of return, the auctioning system and its specialities in the context of art and the methodology for analysing arts markets (e.g. the use of data and creation of price indices).

There then followed the final phase, in which research is conducted "essentially following the main stream (art) movement". This trend continues up to the present, as researchers have gone on to specialize further in the commonly known issues, using newer statistical methods to confirm facts that have already been established. Frey (1997) divides this state of research into three classes: first, the study of "art as an investment", which is about the comparability of art as an investment with traditional assets, the risk/return ratio and the general returns of art investment. Secondly, "more detailed studies on auctioned paintings" take place, focusing on genres, individual artists, particular actors or specific countries. Thirdly, Frey points out "studies on multiples,

[2] When in the following dissertation it is spoken about "art" there is obviously meant the area of fine arts as defined here.

other antiques, and all forms of collectibles", which means that research is extended to other sorts of more or less collectible items like violins, firearms, antique furniture, toy soldiers, beer steins, stamps or wine. This classification is probably too simple to provide a complete overview of current research, and for this reason a different classification will be employed here to describe the state of research in more detail (see part 1.2 below).

Nonetheless, research in the area of art as an investment has recently been accelerated through a paper by Mei & Moses (2002b), which was well recognized by researchers and the public and gave a new impetus to research on the economics of the visual arts.[3] The latest trend seems to be regional studies employing the latest statistical findings, such as those on China (Mok and Ko, 1993), Latin America (Edwards, 2004), Australia (Higgs and Worthington, 2005) and Canada (Hodgson and Vorkink, 2004). On the whole, these studies are no less valuable than the first ones, since they "devote themselves to increasingly narrow and intricate issues connected with the art market". (Frey, 1997)

1.2. Analytical and Statistical Research

To take another perspective on research history, Blaug (2001) advised that research in the field of cultural economics can be separated into an analytical and a statistical process. I will make use of this differentiation in order to consider the visual arts in greater detail, especially with regard to the less popular analytical type of research not mentioned in chapter 1.1 above. Please pay special attention to the fact that many topics of cultural economics have not yet been featured in research on the visual arts, e.g. Baumol's famous cost disease, and therefore will not be mentioned here explicitly.

Statistical research in the fine arts is, by its nature, mostly about art as an investment and the rate of return when investing in art. First, when discussing art as an in-

[3] Actually, I was influenced by this paper as I started research in this area and wrote my university diploma on this topic.

vestment the problem of creating price indices for calculating returns has to be solved, and that is what many scholars have dealt with in their papers.

As already mentioned, Wagenführ (1965), Anderson (1974), Stein (1977) and Schneider & Pommerehne (1983) began their research early, before Baumol (1986) came along with his groundbreaking publication. Interestingly, three of these researchers found different ways of calculating price indices for art. Baumol used a simple method of "double sales" and calculated their average yearly prices; Stein introduced a method called "average painting"; and Anderson used what he called "repeat sales regression" (which was later improved by Goetzmann (1993) as well as Pesando (1993)). The "average painting" method was later improved by Candela & Scorcu (1997) to develop what they called the "representative painting method". Last but not least, there is a method called "hedonic regression" introduced by Chanel et al. (1996) which is now the accepted standard in art price index calculation. A good overview of the methods from a technical point of view, as well as evaluations of their pros and cons, have been given recently by Chanel et al. (1996), Burton & Jacobson (1999), Fase (2001), Candela et al. (2003) and Ginsburgh et al. (2006).

When looking at the results, it is quite astonishing that no clear picture of art price returns can be drawn. Among the many studies which propose that art provides a lower return than investments of comparable risk (due to its character as a good and its several dimensions of utility; see chapter 2.1 below), there are some colleagues who find higher results. For an overview of research results according to the returns obtained by investing in visual arts I suggest Frey & Eichenberger (1995a, , 1995b), Agnello & Pierce (1996) as well as Burton & Jacobson (1999).

The close interconnection of this topic with financial economics pushed the research in another direction, focusing on the financial markets and the use of art investments in this context. Stein (1977) was one of the first to start this research, which was broadened by Chanel (1995), Czujack et al. (1996) and Flores et al. (1999). Important topics are the combinations of art and "classic" investments in a portfolio and the reac-

tions of the art market to booms or recessions on the stock market. Pesando (1993), Renneboog & van Houtte (2002) and Mei & Moses (2005), for example, used portfolio theory to evaluate the optimal portfolio in terms of return and risk; Bernhard (2005) analyzed the use of art in an investment fund. Another direction of research investigates the short- and long-term interconnections between the art and equity markets. (Stein, 1977, Worthington and Higgs, 2003)

The last focus of the statistical research is on the functioning of art auctions and the underlying price-building mechanism, namely auction pricing. This topic is not only interesting in the context of art auctions, but the results of auction theory have been adapted to visual arts auctions many times. (Ashenfelter, 1989, Louargand and McDaniel, 1991, Beggs and Graddy, 1997, Ashenfelter and Graddy, 2003) Also, circumstances such as the price-fixing conspiracy between Christie's and Sotheby's have been of special interest (Ashenfelter and Graddy, 2005). Along with the functioning, pricing/placing strategies and the topic of commissions, research has been conducted on the interconnection between pre-sale estimates and resulting prices, e.g. by Bauwens & Ginsburgh (2000) and Mei & Moses (2005).

Analytical research concerning the market for fine arts started much earlier, considering the foundations of the market and the actors themselves. Before calculating rates of return, it is important to comprehend the nature of the art market and its hierarchy, and to understand the persons and institutions acting within it in order to evaluate their behaviour on the market. This point is often forgotten by researchers, most of whom take a statistical approach.

The first more or less systematic explanation of the art market, its hierarchies and actors was given by Rush (1961), whose intention was to provide an introduction for the prospective collector. Since then, through extensions and more economic views on this topic, which were best described by Throsby (1994), a fairly clear picture of the art market structure and its actors has evolved. As a result, a division into three market levels has emerged: the primary market representing the lowest level of trade, mostly

between inexperienced private individuals; the secondary market, with regional relevance and more professional actors like galleries and art dealers; and finally the tertiary market, which is international in scope, with auctions playing a major role among big galleries and dealers. The industrial organization of the art market is of particular interest, since many of the anomalies presented in this thesis result from inefficiencies in this sector. Therefore, in chapter 2.2 this topic is presented in depth. In connection with the market hierarchy, it is interesting that asymmetric information seems to be one of the driving forces on the art market. Surprisingly, this topic has rarely been explicitly focused upon, e.g. by Baumol (1986) and Coffman (1991).

Among this general research, few researchers have focused on smaller areas of the market hierarchy or specific actors. Due to its visibility, analytical research has also focused mainly on the tertiary market. Nevertheless, some researchers also have done research on the secondary market (galleries and dealers) which gives interesting insights into a nearly closed market. These are Shubik (2001), Benhamou et al. (2002) and Candela & Scorcu (2001), who analyzed the gallery and dealer markets in detail on the basis of available data, personal interviews or questionnaires. As this topic is of greater relevance considering the many transactions that are conducted in this market, it will be focused on in chapter 4.1 of this thesis.

Another class of art market actors are the artists themselves, who also feature in economic literature. In particular, artists' labour markets have been of interest. Throsby (1992) and Towse (1992) worked on the differences between labour markets for artists. Filer (1986) argued that there are more analogies in the labour markets than one would initially expect. One topic of special interest in this area is the income of artists, which was discussed by Pommerehne & Frey (1993) in chapter 9 of their book. This topic will be analyzed in detail later, together with the existence of superstardom in chapter 4.3 of this thesis. Also, contractual arrangements between the various actors were focused on by Caves (2003) and parts of this topic are of relevance in chapter 4.1 of this thesis.

From consideration of the market hierarchy and the actors, it is a small step to the description of the good and its special characteristics. Chanel (1995) has given a thorough overview of the differences between art and financial assets, and many other authors, such as Frey & Eichenberger (1995b), Bianchi (1997) and Bernhard (2005), have provided summaries on this topic. Based on the characteristics of art, the different dimensions of material and immaterial utility can be shown. They are a fundamental explanation for the differences in return that exist between art and other asset classes, and these are also focused on in chapter 2.1 below.

When examining the characteristics of art as a good, the special topic of originals versus copies and their different valuation comes to mind. This topic is of special interest for the whole of cultural economics and was first addressed in the context of art by Benjamin (1963) and continues to be considered by other researchers up to the present day. (Frey, 2000, Tietzel, 2001, Benhamou and Ginsburgh, 2005)

Combining the views of the market hierarchy and its actors with pricing mechanisms, authors like Frey & Eichenberger (1995b), Frey (1997), Fase (2001), Mei & Moses (2002a) and Mei & Moses (2005) have mentioned behavioural economics. The anomalies to be explained by means of this theory have their origins in the financial market and seem to be a very interesting research area for the future, as already pointed out by Frey (1997). Examples of these behavioural effects are mean reversion, mental accounting, trending patterns, January, holiday, Christmas and small-firm effects, as well as endowment, opportunity-cost and sunk-cost effects. Unfortunately, these effects have only been a topic in theory and have not yet been viewed in combination with art market data.

Public subsidies of the arts have also been a topic of broader relevance in research concerning the industrial organization of the - mainly European - arts sector. For example, Grampp (1989), Pommerehne & Frey (1990), Throsby (1994) and Besharov (2003) examine this topic in detail. The most up-to-date research area in this respect is the so called “Droit de Suite” (artists’ property rights), meaning that since 2006 artists

are entitled to earn a specific amount on every transaction as a kind of "copyright" payment. (Stanford, 2003) The property rights for artists have also been focused by Santagata (1995) and also Rushton (2001).

When putting this analytical research into a larger frame and bringing it to relevance in the context of cultural economics, some more general researchers have made a significant contribution. Explicit mention should be made of Throsby (1994), who has given a detailed overview of all the interesting topics of research. Also Pommerehne & Frey (1993) have published a book dealing with this special topic more or less as an overview. Of great relevance for research today are also two books connected with Towse (Towse and Khakee, 1992, Towse, 1997) and one by Ginsburgh & Throsby (2006) as they feature some of the main articles concerning research conducted in recent years and set them in a broader context.

1.3. Outline of this Thesis

The introduction above provided some insights into the history and areas of research in the fields of cultural economics and economics of the visual arts. Connected to this, Frey (1997) asks whether, in research on the visual arts, "diminishing returns set in, and if so, how strongly"? This raises the problem of the sense of further research in this area. Should researchers specialize more and more in the details of the art market and adapt commonly known theories to it, or is it possible to find new areas of research, thus widening the research agenda?

Following the idea of Frey and answering his question, this thesis aims to define new and exciting areas of research in the economics of the visual arts. Along with the mostly "straightforward" application of anthropological and economic theories to the art market, there are also topics that seem better suited to the imperfect character of the market, its actors and price-building mechanisms. The following thesis will take a practical look at three special anomalies and present economic explanations and statistical evidence for them. At the same time, a more integrated approach combining both statistical and analytical research is attempted, in order to bring together the best of both

worlds. The main method which will be used to explore new areas of the economics of the visual arts is to use data for analysis which has never been used before in this depth and combination.

Chapter 2 will therefore set out the most useful and basic theories for understanding the art market and its foundations, which - incidentally - could not be focused on in the separate analysis presented in chapter 4. In Chapter 3 the importance of the used data and its sources will be highlighted because all three analyses rely on new data or combinations of data which have never previously been used in this type of research. Chapter 4 will present the three analyses containing detailed descriptions of the anomalies found in the course of the research. Finally, Chapter 5 will draw a conclusion and indicate potential areas of further research.

The thesis presented here has one drawback resulting from its structure. The analyses presented in Chapter 4 constitute in-depth analyses of special phenomena of the art market. They explain these phenomena on the basis of state-of-the-art research which, because of its nature, sometimes assumes knowledge of all the basic theories developed over the last 40 years, without explaining them. Therefore, this thesis has an introductory part as well as Chapters 2 and 3, which try to provide the basic background knowledge needed for the topic to be properly understood and in order to fit it into the wider frame of research. Nevertheless, these contents sometimes overlap with contents presented in the analyses, and I hope that this will not detract from the reader's pleasure.

2. Basic Theories

In addition to the overviews concerning the theories already presented, there is a need to present the foundations of art markets in order to understand the applications presented in Chapter 4. First, I will start by presenting the characteristics of art as an economic good, since they are of absolute relevance for understanding the problems that occur when discussing art from an economic point of view. After this, the structure of art markets and the relevant actors are described. Lastly, the pricing mechanisms for art will be discussed, as they are special and differ from those of other goods.

2.1. Art as a Good

Stein (1977) says that "paintings are extraordinary economic goods", but why are paintings or is art in general so special? The explanation can be found when we consider the characteristics of art as a good in comparison with classic goods described and used in economic theory. The opinions regarding the classification of art as a good are several, and so it is useful to discuss some popular thoughts.

Art, by definition, is a **heterogeneous good**[4]**,** as no two items are identical - each work of art is unique as regards style, material, expression, execution time and so on. The act of producing art does not create a series of homogeneous goods like the industrial production process. The creativity and human imperfection involved make mass production impossible. Art can be copied, but it is not reproducible. The case of art fakes, as illustrated by Frey (2000), for example, demonstrates the differences between original and copy, even if they seem to be physically identical.

But although art is a heterogeneous good, a **limited degree of substitutability** exists. Works of art bear certain similarities and characteristic traits, e.g. on the basis of the art school, the executing artist or the size of the work. But in other features they differ fundamentally, e.g. the execution time, colour and motif. Depending on individual preferences for the numerous traits of artworks, substitutability may exist to a certain

[4] With the exclusion of prints, photographs and others which are produced in (limited) editions.

degree, which weakens the characteristic of art as a heterogeneous good. Consequently, while prices are interconnected, each piece adds its own attributes, resulting in price differences within a given range. (Grampp, 1989, Bernhard, 2005) In the case of a collector with strong personal preferences, the degree of substitutability among selected artworks is lower than in the case of a dealer trading in a certain genre of art.

Art is not threatened by destruction; is it **durable good** in the classic sense. Destruction of art does take place, but is not in the nature of the good itself. If a collector buys an artwork and decides to keep it in his private rooms where it is not visible to others, art is a **private good**. A good is defined as private when others can be excluded from consumption and there is rivalry over its use. In this case, the artwork disappears from the market - sometimes forever. But art can also be a **public good** when a museum decides to buy a piece and to display it free of charge. (Stein, 1977, Throsby, 1994) Free accessibility and non-rival use to a certain extent define public goods.

The definition of a "**club good**" is also appropriate with regard to art. The theory goes back to Buchanan (1965) and describes a subtype of public goods that are excludable but non-rivalrous in use. Examples of club goods are cinemas, private golf courses, cable television, access to copyrighted works, and the services provided by social or religious clubs to their members. Art can also be interpreted in this way, as shown in Chapter 4.1 of this thesis.

According to Nelson (1970), goods can also be differentiated by the process used to judge their quality. There are **search goods**, where the quality is clear before the act of consumption, and there are **experience goods**, where prior use is necessary in order to evaluate the quality. This is because the characteristics of the good can only be appreciated through use and not via descriptions or by other means. After using the good (having the experience) the consumer can evaluate it and therefore name a price according to his personal utility. Finally, there are also **credence goods** (Darby and Karni, 1973) where the characteristics cannot be evaluated completely even after use of

the good. Following Talkenberg (1991) "depending on the motive… and knowledge, art can be a search, experience or credence good".

Taking Stein's (1977) differentiation, there are **consumer and capital goods**. Depending on the use for which art is bought, it can be either a durable consumer good bought for personal enjoyment of the arts, or a capital good, in which case it is treated as a financial asset. In between this classic differentiation, Stein has coined the term "**collector's good**" to characterise the mixture of different characteristics of goods applicable to art.

To return to economic terms, art is, of course, a **superior good**, with demand depending on the available income. The higher the income, the more money will be spent on art. (Grampp, 1989) This is the case for all luxury products, of which art is also one.

Last but not least, art is also a **merit good**. (Grampp, 1989) This term goes back to Musgrave (1959), who describes a merit good as a commodity whose ownership is regarded as desirable for an individual on the basis of a norm, rather than because of personal consumer preferences. This is sometimes the case for public goods, e.g. education or art, where no functioning market mechanisms of supply and demand would develop without public subsidies. The explanation of art as a merit good is often used to justify public subsidies for the arts and art museums. (Pommerehne and Frey, 1990)

Taking into account these various descriptions and classifications of art as a good, one can say that art combines characteristics of tangible and intangible products, but no definitive decision can be made as to which category it belongs in. Compared to other goods, art is special and this seems to be one reason for the complexity developed by the market, as described in the following chapters.

2.2. Art Markets and Actors

It is known that Phoenician and Roman dealers traded in art not only at auction but also on trade-markets. The structure of the art market has not changed dramatically since these times. (Keen, 1971, Hutter, 1992, Gerard-Varet, 1995) According to

Throsby (1994) the following structure of the art market and its actors can be described[5]:

The **primary market** consists mostly of private buyers, garage sales, thrift stores, small antique shops, small part-time galleries, provincial auctions, dealers and artists. Art traded here can hardly be differentiated from handicrafts because of a lack of quality and basic education of the artists in the arts. In the primary market there is often no focus on special art schools or styles. Due to the nearly unlimited supply in this market, prices are close to the cost of production. The primary market is highly competitive. The deals on this market take place without visibility for the public.

The **secondary market** is organized regionally or in national clusters. Artists with special abilities or artistic styles and movements are represented by specialised galleries or dealers. Art buyers are private individuals, companies or small museums. Due to the limited supply but relatively high possibility of substitution, there is monopolistic competition in the secondary market. The trade on this market takes place in a concealed manner, too. This is because of the special role of the middle-men, namely galleries and dealers, who arrange deals between artist and buyer. The role of the middlemen as well as the characteristics of the secondary market will be featured later in this thesis. They have also been analyzed in studies by Candela & Scorcu (2001), Shubik (2001) and Singer (1990).

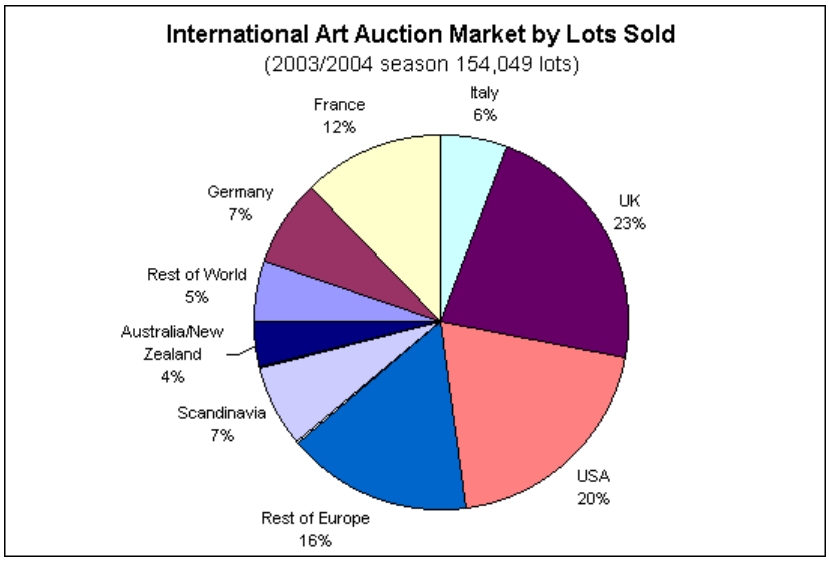
The **tertiary market** is what all reports and publicity are about: the international auction market as well as international galleries and traders. The art which is traded in this market is produced by well-known artists who are of artistic and historical relevance and represent established movements. Wealthy private individuals, as well as major companies, museums, dealers, galleries, investment funds or even speculators, are buyers in this market. As supply in this market is limited, with no possibility of

[5] Sometimes the hierarchy of the art market is described the other way round, with the lowest level being called the tertiary market and the highest level (auction) the primary market. There is also a contrary definition of the primary market as the area of production and the secondary market as the area of dealing in art set out by GERARD-VARET, L. A. (1995) On pricing the priceless: Comments on the economics of the visual art market. *European Economic Review,* 39 509-518.

substitution and demand being assumed to be very high, the tertiary market is a monopolistic market. The tertiary market is a "highly visible, highly organized, sophisticated, international (art) market, consisting of sales through top auction houses and dealers. Admittedly, most investors and portfolio managers who would consider investing in art would think first of buying in the international market." (Coffman, 1991).

As regards the description of the regionalism and trading volumes of the markets, it is difficult to obtain definitive figures due to the problem of visibility and the structure of the art market. The picture is different when it comes to the international auction market, and here at least some figures can be found. The international trading volume by lots concentrates on the USA and UK. During the 2003/2004 season, an aggregate of 43 % of lots were traded in these countries. France, Germany and Italy follow closely and together with the rest of Europe and Scandinavia 91 % of all lots are traded in western countries. Hence, the international art auction market is dominated by the western world.

Figure 1 **International Art Auction Market by Lots Sold (2003/2004)**

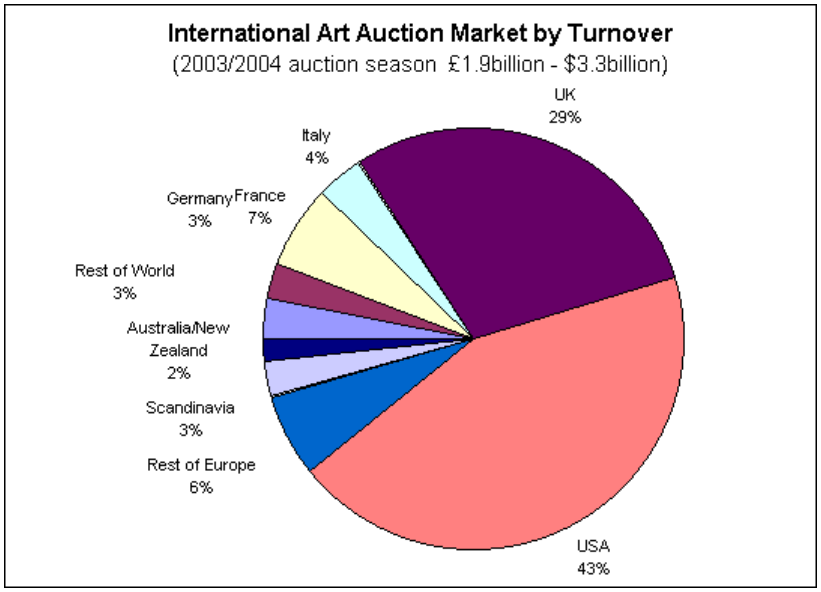


(Art Sales Index, 2007)

The resulting picture is reinforced when it comes to the figures for trading volume by turnover. The USA and UK dominate with an aggregated turnover of 2.376 billion USD in the 2003/2004 season, which is about 72 % of the world-wide trade volume in auction markets. Germany, France and Italy only have an aggregated volume of 14 %,

which is about 0.462 billion USD. Ninety-five per cent of the auction market turnover takes place in the western countries, including those presented along with the rest of Europe and Scandinavia.

Figure 2 **International Art Auction Market by Turnover (2003/2004)**

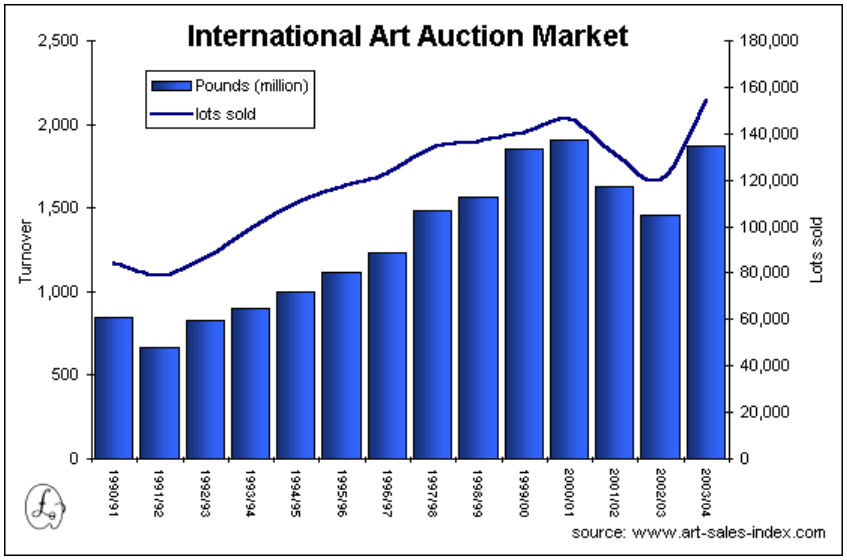


(Art Sales Index, 2007)

Comparing this with the latest figures published by artprice.com, the picture is confirmed: USA (41.72 %), UK (29 %), Switzerland (19.51 %), France (4.86 %) and Germany (2.26 %) together accumulated 97.35 % of the worldwide auction turnover in 2006, with a remaining 2.65 % for the rest of the world at a total turnover of approximately 113 million EUR. (Artprice.com, 2006)

When examining the development of the international art auction market by lots and turnover in the years from 1990 until 2004, it is evident that there has been a continuous increase in the size of the market, except in the years around 1991 and in 2001-2003, when the art market was hit by recession due to a speculation bubble that had built up in the preceding years.

Figure 3 **International Art Auction Market by Turnover (1990 to 2004)**



(Art Sales Index, 2007)

In connection with this view of the market hierarchy and the volume of the international art auction market, the behaviour of the actors involved is of relevance when drawing up a proper description. Important analyses concerning this matter have been published by Singer (1990) and Singer & Lynch (1997). To classify the actors and their behaviour on the art market in a rather more structured way, the following traditional segmentation makes sense.

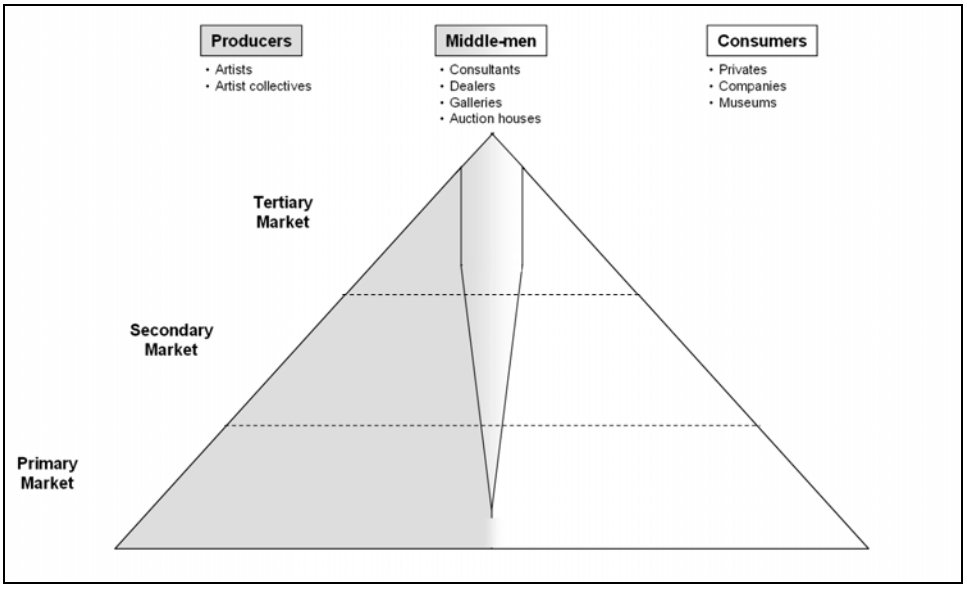
The **producers** of art are artists or artist collectives. These actors mostly have special education in the arts, especially when their works are traded in the secondary or tertiary market. They are mostly professional artists, rather than amateurs.

The **consumers** of art are various: private individuals, companies or museums. They all have motivations for their purchases based on their perception of the value components of art (taste and utility), which will be explained in chapter 2.3 below. This can result in consumers who are interested in the decorative element of art, the historic, intellectual or artistic value (e.g. the classic collector as presented by Bianchi (1997)) at the one extreme, or whose main concern is with the possibility of gaining positive returns from an investment (e.g. banks and funds, see also Herstatt (2006)), at the other. Thus, there are various consumers on the art market creating demand which is hard to anticipate due to the differences in motivation. A special role is taken by museums or

other governmental organisations, e.g. the German Bundeskunstsammlung, which has been collecting art since 1970. Here, public subsidies are invested in art with several intentions, ranging from stimulation of the local economy to making a historic impact. Several works have been published on the special role of museums in the art market, such as Grampp (1989), Pommerehne & Feld (1997) and Frey (1998). The more general topic of public subsidies was featured by Pommerehne & Frey (1990) and Pommerehne & Frey (1993) in chapter 11. Neither of these topics will be focused on in depth here, as the public promotion of the arts is of decreasing relevance nowadays and the topic itself is outside the scope of this thesis.

At the higher levels of the hierarchy of the art market, **middle-men** (sometimes also called intermediaries) step in between the producers and consumers of art. These middle-men can range from small regional to large international art consultants, dealers, galleries and auction houses. Due to their special role they select art for the consumers out of a big supply market, very often adding "sense" to the product, e.g. by creating trends, by explaining how they fit into existing collections, and so on. The role of middle-men is very special as it can be part of the consuming and part of the producing side of the art market, and frequently conflicts of interest arise from this role. It is therefore very hard to generalise and evaluate, but nevertheless it is the main object of interest in chapter 4.1 of this thesis.

Figure 4 The Classic Structure of the Art Market and its Actors



(own diagram)

This simple diagram must be adapted to accommodate the more complex situation that is found in real life.

The artist as **producer** often does not actually produce the physical product itself any more. Increasingly, this is done by various **assistants** or craftsmen, very often organized in small companies. The artist is responsible for the concept and the planning of its realization.[6] A famous example is Jörg Immendorff, who had famous master paintings of his career redrawn by various assistants in 2005/2006 - he himself being unable to do so due to an ALS disease. But even living artists who are not affected by illness follow this more or less company-like division of labour: Wolfgang Tillmans, a famous German photographer living in London, has a company dealing with the production of his artworks which employs numerous people and runs a gallery called "Between Bridges" (the room between his studio and his private rooms).

The **consumer** today is not just a consumer any more. When prominent individuals buy art, they can influence the whole art market through their decision; thus, the consumer can actively influence the state of the art market and the trends presented. In this case, the individual concerned can be called a **prosumer,** to adapt a term used in mar-

keting and the new economy to express the fact that the consumer influences the state of the product. (Toffler, 1981, Kotler, 1986) Although the prosumers in the art markets do not typically influence the physical traits of the artwork, they do influence the karma or aura of the artwork through their decision. This influence affects not only one artwork; it can result in positive and negative effects on the artist or even on a whole art school. A famous example of this is Charles Saatchi, who actively influences demand for certain artworks when he publicly decides to buy certain items, e.g. Young British Artists (YBA), German painting or Chinese art.[7]

The role of the **middle-men** is also extending today. Exhibitions and art shows, rather than traditional museums, are gaining interpretive predominance and are increasingly becoming gate-keepers for artists and their galleries, as in the case of Art Basel, Frieze art Fair or Art Cologne, for example. (Rauterberg, 2005) Unless his works are exhibited in special exhibitions, an artist is not able to become famous. The role of the middle-man has become crucial for an artist to gain relevance in the art market. They also add "sense" and background to the art on display, and therefore play an active role in the art market today.

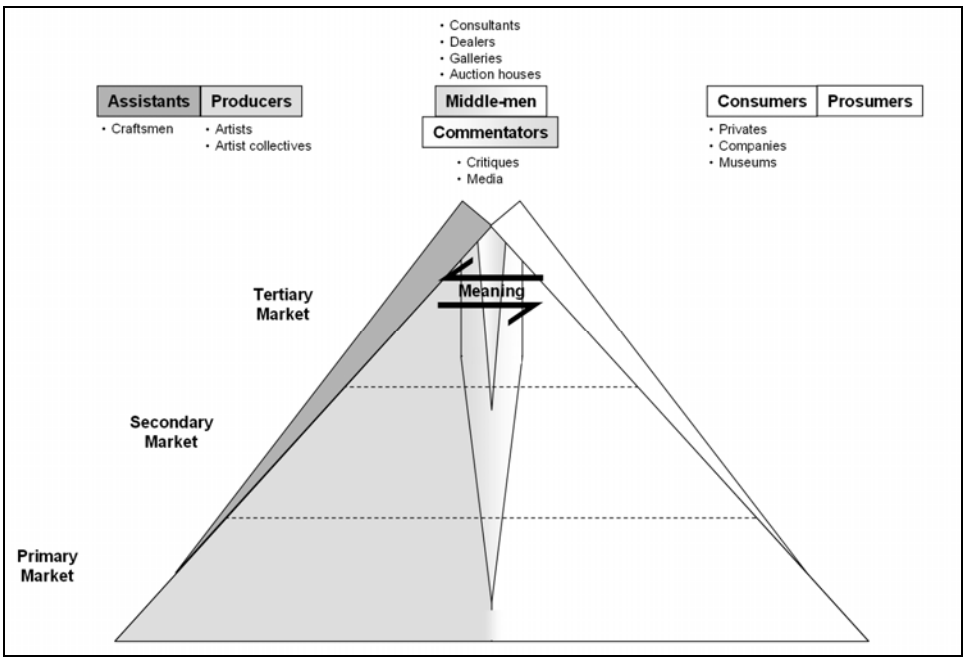
Furthermore, a new class of actors on the art market is gaining relevance. I will call them **commentators** as they are not connected with the business of selling and buying art. These are art critics and the public, who use various types of media to publish their opinions concerning the art market. They all add content to the art itself and therefore play an active role in the production of art as a producer of sense, understanding and comment. In addition to the traditional media of books, journals, magazines or newspapers, the modern media such as radio, TV and the internet are responsible for a much broader exchange of opinion and comment, which influences the actors and mechanisms on the art market. (Hollein, 1999) For a small sample of websites illustrating this growing field of media attention, please see Appendix A.

[6] This was already the case with early artists like Cranach or Rembrandt having small factories producing their artworks.
[7] Saatchi actively pushed special groups of artists with his exhibitions "USA today", "Triumph of Painting" and "Art from China", resulting in higher prices throughout the market.

The presented trends form the outline of a bigger picture in which "meaning" plays an important role in the game of the art market, since it shifts attention from the characteristics of the artwork to the surrounding factors. In the past, the characteristics of the artwork and the ability of the artist were crucial for success in the art market. Nowadays, the surrounding context - built up by the consumers, middle-men and commentators - is becoming a more and more important factor in an artist's success and in the evaluation of success in the art system.

These factors lead to a new and more complex interpretation of the structure of the art market and its actors, as presented in the following diagram.

Figure 5 Extended Picture of the Art Market and its Actors



(own diagram)

Despite this increased segmentation of the art world, which makes it harder to separate the classic roles and ambitions of the actors, other trends can also be observed. Actors on the tertiary market engage in secondary markets in order to widen their value chain. Auction houses buy galleries and funds buy galleries, which results in market actors assuming roles they have never previously been seen in, e.g. auction houses are

represented at art exhibitions.[8] (Herstatt, 2004, Herstatt, 2007) This trend is critically monitored by the other market actors, as it represents a change in the traditional mechanisms in the presented picture of the art market, which makes it harder for the established actors to maintain their role, e.g. as well-paid gate-keepers. These new trends under the influence of modernity and post-modernity have been best described by Joy & Sherry Jr. (2003) in more detail. A view, especially on the differences between the auction and gallery market, is therefore given in chapter 4.1 of this thesis.

Basic explanations for this trend could be globalization and modern media like the internet, which facilitate worldwide trade and reduce asymmetric information between buyer and seller in the markets, resulting, for example, in more transparent price information. (Joy and Sherry Jr, 2003) In particular, asymmetric information owing to differences in time and location has been reduced enormously due to the internet and more global markets. The characteristics of art can be transported better and the sellers/buyers have more opportunities to exchange information.

Hence, a general trend for the art market and its actors is that the former "closed shop" for insiders in the art markets seems not to exist any more. The art system is extending into more public areas and mixing up its strict hierarchies. This makes it harder to analyse the art market using the old theories developed in the past but probably makes it easier to analyse the art market using common methods of (financial) economics. Perhaps the art market is developing in a similar way to other creative industries, like music and film, as a classic market for creative goods and services? This would make it possible to adapt the approaches used in cultural economics and re-integrate the economics of the visual arts into this greater theoretical framework.

2.3. Pricing of Art

As a result of the structure of the art market and the actors engaged in it, as well as the problems with art as a more or less special asset class, some words need to be said

[8] In 2007 Christie's bought the London-based gallery "Haunch of Venison". Several years before, Sotheby's bought the gallery "André-Emmerich" and cooperated with "Jeffrey Deitch". The art fund "Art Estate" owns

about the resulting pricing mechanisms. There seems to be no reason why the prices for art are not defined by mechanisms of supply and demand, and this is why I will follow with a description of both sides of the market before describing the mechanisms evolving out of it. Please also see chapter 4.2 of this thesis, as this contains a detailed analysis of supply and demand dynamics as applied to the auction market.

Coming to the discussion of supply and demand on markets, the main question is what amount of art is bought at a particular price and how much this amount changes when the offered price changes. Before examining these dynamics, it is important to understand the driving forces of initial demand and supply of the market actors on a single and aggregated level. Therefore, these motivations will first be described for both sides of the market before the resulting dynamics are considered.

The estimation of the value of works of art is difficult because, from an outside view, the **demand** seems to follow random patterns. Demand is dependent on the taste and utility an individual connects with art. Art as an asset class combines different value components from material and immaterial value. Each individual has his own attributions to the presented value components, which makes the valuation of art on the demand side so difficult.

Of course, art has a *material value* which influences the price on the art market. First, there is the price of the goods and manpower needed for the production of the artwork. This can be canvas, paints, tools and other materials. An often underestimated fact is that the products and time needed for the production of art are sometimes very cost-intensive and therefore the resulting minimum price on the primary market can easily exceed 1000 USD. The other part of the material value is about the financial dividend which can be realized as a result of owning art. The profit is easy to calculate by comparing the price change between the action of buying and selling the artwork on the market. Other costs and risks have to be deducted from this return, however. These

the “Vonderbank” gallery with branches in Hamburg, Frankfurt and Berlin.

are transaction fees, insurance, tax and transportation costs, as well as the risk of burglary and destruction. (Chanel, 1995, Frey, 1997)

Motives for seeing art as an investment with material value are "storage of value" and "speculation". The storage of value follows the idea that high inflation causes people to spend money on things which preserve their value and therefore are not affected by inflation, e.g. real estate, gold or art. This is commonly called "hedging against inflation". (Schneider and Pommerehne, 1983) Speculation is indicative of the fact that high returns can be realized by investing in art compared with investing in other assets. Both motives are dependent on the amount of money available, i.e. the liquidity and income of individuals. With a higher income or growing wealth of an individual, the demand for art grows. This explains the well-known interconnection between the demand for art and the state of the world's economies. (Hutter et al., 1989) Another aspect is the proportion of possible returns and risks compared with other investments. If it is positive for art, demand also increases. (Renneboog and Van Houtte, 2002)

As I have shown in chapter 2.1 above, art is different from classic goods and this is why the presented material values cannot fulfil the expectations in respect of return and risk compared with other assets. Therefore, another value component of art must exist: namely, the *immaterial value* or "private-value component" of art. (Goetzmann and Spiegel, 1995) This form of utility is about "consumption" and "status". With the consumption of art, what is known as an "aesthetic dividend" can be earned, depending on the personal appreciation and valuation of the artwork when looking at it. It depends on personal preferences like colour, form and genre (Chanel, 1995) as well as the viewer's personal education and previous acts of art consumption (Hutter, 1992). An "interest in art is the consequence of experience, training, and learning". (Grampp, 1989) Goethe said that "collectors are happy people" which points towards a special aura surrounding art; the viewing of art increases creativity and a person who invests in art invests in "meaning" for his own life. (Wilke, 1999) The utility of status is realized when other people admire someone's ownership of art. One can demonstrate education, abundance and quality of life to the public or one can express one's personality and use art as an

instrument of communication. (Hutter, 1992) Altogether, the immaterial value components are often described as an "ownership effect" of art. The more immaterial values are attributed to an artwork, the higher the ownership effect and the higher the resulting demand for art is. (Frey and Eichenberger, 1995b)

For a smaller circle of people art has also an art historic value. Criteria for valuation are appearance in the art discourse, the degree of innovation and the position of the artwork in the work of the artist. The higher the art historic value, the higher the demand. (Hutter, 1992) This is also valid for the "pedigree" of an artist or artwork, as Schneider & Pommerehne (1983) have shown.

But also the immaterial valuation carries certain risks, which mainly result from the attribution character of the tastes and utilities shown above. With changing trends, fashions and tastes, the attribution of these immaterial values changes and therefore the value of an artwork in general can decrease (as well as increase in positive cases). This risk typically does not exist for collectors, as they more or less decide on their individual tastes, but it hits the (financial) speculator all the more, since he is guided by the attributions of the market when entering into deals. (Frey, 1997)

Thus, it is evident that as well as the physical characteristics of an artwork being responsible for its valuation, there are also many soft factors, which are driven by trends and fashions. The middle-men and commentators can influence these trends and therefore take an active role in the creation of demand. This growing importance of "meaning" for the resulting demand surrounding the artist and his works is the main factor in determining the prices realized on the market. But as the descriptions above show clearly, evaluation of art, and therefore the prices paid on the demand side, have been decoupled from the costs of production in the secondary and tertiary market.

Theoretically, the short-term **supply** of artworks consists of all the works of art ever produced, regardless of who or which institution owns them at the moment. This includes all works owned by private collectors, the stocks of dealers and galleries, as well as artworks owned and exhibited by museums if there is at least a theoretical pos-

sibility of them being offered on the art market. But although this may be the case in theory, in practice "most of the art that has been made since the beginning of time has not survived". It "was thrown away, discarded, neglected, forgotten, lost, burned, wilfully destroyed, sold for the frames, the canvas put in the trash or scraped to become another picture that had the same fate". (Grampp, 1989) Therefore, supply is strictly limited in the short-term. Dead artists cannot produce more artworks and even the living ones cannot produce masses of works in a short time. In the long run, this situation changes slightly: living artists, of course, have the chance to produce more artworks and therefore extend supply. Ekelund et al. (2000) have defined "an artist's (or artists') supply as a function of her rate of output along with some sale rate of the artist's works at auction and elsewhere".

Thus, regarding the rate of output from a microeconomic view, it depends on the costs of production and the opportunity costs for the producer (in this case the artist). The *costs of production* should have decreased dramatically over the years, as new methods of production (digital photography, video, computers and so on), division of labour, substitution of machines for men and prefabricated materials have been introduced in the fabric production context as well as in the art production context. Also the typical "artist company" (as described above, where the modern artist employs a lot more people) separates its tasks into different divisions, e.g. production, design, sales and marketing. (Schneider and Pommerehne, 1983, Ginsburgh and Penders, 1997) From this point of view, the marginal costs of production should be lower today than in the past. Contrary to this trend, however, the artworks produced are of different types than years ago: bigger, better, more spectacular projects are carried out and the assumption is clear that the decreasing costs have resulted in an increase in the dimensions of project or artworks. Coming to the *opportunity costs* of artists, it is clear that many of them compare their income and working life with those of other people and actively decide to become or stay artists. The division of labour shows that artists are aware of their own opportunity costs and this implicitly shows that artists are seeking after profit - even if they would never publicly admit it. (Grampp, 1989) To explain this counterin-

tuitive fact, it helps to imagine an artist not seeking for profit. Without profit, subsequent projects and artworks could not be realized, since the risks of production could not be covered nor the costs of production paid. Because of this, artists have to be profit-oriented in order to secure their own survival as artists in the future.

Among these limiting and supporting aspects of the production of art for an artist, explicit strategies are adopted by artists and by the typical sellers of artworks - namely galleries, dealers and auction houses - in order to limit supply, the supply generally being dependent on the expectation of future prices on the art market. (Schneider and Pommerehne, 1983) Depending on the future price expectation, the supply can be limited or extended on the market. Grampp (1989) cited many examples and concluded that "all of these painters tried to increase their income by reducing the supply of painting (and painters)". Another instrument for influencing supply and the resulting prices on the art market concerns product differentiation. Product differentiation is used to avert substitutability with other artworks and artists. This strategy enables the seller to engage in monopolistic price setting. (Grampp, 1989)

As regards these descriptions of supply and demand on the art market, it remains questionable whether these two sides of the coin can indeed be separated in this way for the art market. Bearing in mind that art is an experience good, a prior act of consumption is needed in order to form tastes and influence the next act of consumption. Because of this, it can be said that the mechanisms on the art market are influenced by "**supplier-induced demand**" (Blaug, 2001). This means that the supplier has the power to shift the demand curve for the products and services he/she is offering. For the fine art market I will redefine this point of view and call this phenomenon "**middle-men induced demand**" as I think that the middle-men presented in chapter 2.2 above are responsible for the mechanism behind demand and ultimately for the determination of prices. This fact is also shown in chapter 4.1 of this thesis. Another reason why it is difficult to separate demand and supply along with the art market actors is that the actors mostly appear on both sides of the market. A classic collector buys artworks, of course, but very often he also sells some. This is also true for galleries, dealers and

even auction houses, which all appear on both the demand and the supply side of the market.

Taking together the given aspects of supply and demand in art markets, the following price-building mechanisms become evident. In the primary market, supply is nearly unlimited due to a high degree of substitutability between the artworks and the low costs of production. Because of limited demand resulting from a lack of material and immaterial values of the artworks on offer, the resulting prices are close to the costs of production, as standard economic theory suggests. Thus, we have a perfect market with perfect competition and price-building mechanisms. In the case of the secondary and tertiary market, however, the picture becomes more complex. According to Schumann (1999), these markets can be characterised as markets with monopolistic competition. There are many buyers and sellers with different preferences and the flow of information is asymmetric. The offered goods are broadly similar but differ in details. In principle, every seller has a monopoly because of this but it is limited by the substitutability which leads to weak competition between the sellers. (Bernhard, 2005) Because of this, monopolistic competition between the sellers takes place in the face of numerous buyers who are attracted by the material and immaterial characteristics of the works of art on offer. Ekelund et al. (2000) defines an artist in this case as a "durable goods monopolist". Despite this monopolistic market (especially as regards the tertiary market), the resulting equilibrium process is weak. Sales of certain artworks are rare and therefore is it difficult to assume a price level, e.g. at auction or in a gallery. The seller is at the risk of no transaction resulting if the estimated prices or his price statement are too high. When the prices are too low the resulting return is not sufficient, and subsequent sales will probably be influenced by this low price.[9] Consequently, it is difficult to buy and sell art like goods on regular markets where organized and frequent trading takes place; this adds risk to transactions on art markets owing to lower liquidity.

[9] For a discussion of the price setting strategies in auction and dealer markets please see chapter 4.1 of this thesis.

Another aspect of the difficult price formation on the art market concerns asymmetric information, especially on the primary and secondary but also on the tertiary market. According to Coffman (1991) "buyers have better information than sellers about the characteristics of assets. In this case sellers may undervalue their assets, creating opportunities for buyers to find bargains". This problem arises because there are difficulties for the seller in recognising the potential value of a work, as well as identifying and valuating the work precisely. Often the seller lacks knowledge about the art school, style or even the producing artist, which then leads to the aforesaid situation. Also, it is hard to communicate the traits of an artwork over distances of time and place. As a result, asymmetric information between the market actors exists, leading to an imperfect market.

Finally, it is useful to consider the criteria established by Jevons (1965) for the existence of a perfect market. According to these criteria, the art market is not perfect for several reasons: first, there are objective preferences for certain goods because of heterogeneity. Second, personal preferences exist because of huge private networks between sellers and buyers. Third, there are spatial preferences because not all art is traded everywhere in the world. And fourth, there are temporal preferences because certain deals require certain times. As one can see, none of Jevons's criteria are met by the art market, which is a strong indicator that the market structures are far from perfect.

2.4. Conclusion

Art is an extraordinary perfect good. It meets several classifications of goods and combines tangible and intangible traits. Nothing else creates more various emotions, is altogether untouchable and indescribable. Because of this, it is difficult to evaluate it using rational arguments. The emotional factors of evaluation are inevitably tied up with subjective perceptions.

In theory, the market for art is well structured, with three market levels and several actors. In practice, however, these structures have never been very clear-cut, and in recent years new trends have arisen that are increasingly blurring the divisions between

the various structures and actors. The resulting complex and obscure market structures based on personal networks among the actors are hard to describe and evaluate in terms of economic criteria.

The art market has had to cope with these basic problems for hundreds of years and seems to be imperfect according to the economic criteria for price-formation mechanisms. As a result, the pricing mechanisms are hard to predict and difficult to understand for outsiders.

In conclusion, it can be said that the art market is an “imperfect market for perfect goods”. (Wilke, 1999)

3. Data Available for Analysis

The available data about art and the art market can be divided into the following two categories: market data, which is mostly represented by turnover figures, market trends and so on, taking a mainly macroeconomic view of the sector as a whole; and transaction data, which consists of detailed prices for particular transactions, the quality of artworks traded and artist information in general, taking a more microeconomic view.

For the **macroeconomic data** various sources exist which provide information at a "hard" and a "soft" level. From US and EU census data, rare statistical information about the volume of the market for the fine arts is available. In the US census, the NAICS code 45392 stands for "art dealers" (comprising galleries and dealers). In 2002 this sector had 6328 establishments with 21,923 employees and a turnover of approximately 4.24 billion USD. There are also codes for "Auction houses" (453998) and "Auctioneers, independent" (561990) but unfortunately this data does not permit a further break-down of the arts sector. In general, this census data is available online for 1997 and 2002, including comparisons between the two years. (Census Bureau Home Page, 2007) The EU census (called Eurostat) does not deliver such detailed data: until 2002 a NACE code G 52.491 ("Retail sale of art / art gallery activities") existed, but there is no data available online. From 2002 the classification system changed. Now NACE code R 90 represents "Creative, arts and entertainment activities" but there is no opportunity of obtaining more detailed data for the fine arts sector. (Eurostat, 2007) In general the given data is aggregated at a level that does not make it possible to differentiate between the various areas of cultural engagement and thus to extract detailed information about the fine art market. However, market trends can also be extracted from leading monthly publications of the art world, like Art (Germany), Art in America (USA), Flash Art (Italy) or Parkett (Switzerland). The information provided there is "softer", as experts express their feelings about the art market and its current state. Hence, it is evident that economic research concerning the fine arts sector is difficult because, on the one hand, little is available in the way of hard macroeconomic data, and, on the other, softer data is unsuitable because of its subjectivity.

With regard to **microeconomic data,** the structure and visibility of the various art markets are an important drawback to obtaining a complete picture of all transactions. Despite the general problem of visibility, especially on the primary and secondary markets, which will be talked about in chapter 3.1 below, the following data are of interest: prices and characteristics of traded artworks, information about sellers and buyers, about transaction fees and other contractual arrangements (e.g. a buyback guarantee), and general information about artists and their professional career. Along with this "hard" microeconomic information, information about demand and supply relating to specific artists, new talents from art schools and so on could also be of interest. Fortunately, various sources among the magazines named above do provide this kind of data, especially for the tertiary and secondary market, and these are listed in Appendix A. But there are some problems, mostly of a practical nature. The various data sources exist in different forms, from old-fashioned books, microfiche, newspapers and journal articles to modern databases available over the internet or on CD-ROM. Also, the available data differs in content-depth, structure and quality, which makes it hard to use, combine and compare.

As one can see, there is a clear distinction between different types of data. On the one hand, there is "hard" data, which can be counted and proved, and there is "soft" data, which is mostly about feelings and expectations on the art market. The aggregation level of this data decides whether it is meant to be for single transactions, the whole art market or in-between, e.g. an art school. All these facts illustrate the heterogeneity and problematic use of data in the context of analyzing the art market. Due to the nature of this thesis and the analyses presented here, the focus is on microeconomic data about the art market and its transactions. Also - since the results should be provable and reliable - only relatively "hard" data is used. The solution to the afore-mentioned drawbacks is to use data from different sources and then to homogenize and combine it in order to obtain new insights and a larger data sample. Indeed, to have accomplished precisely this is one of the significant achievements of the presented analyses and therefore of this thesis.

This chapter about data is therefore structured as follows: the first sub-chapter will discuss the availability of microeconomic data for the different markets, as quite obviously

the presented weaknesses of the data do not result from poor researching abilities. Afterwards, the four data sources used for the presented analyses will be discussed. In the last sub-chapter the more technical process of gathering, processing and combining the data will be presented as the last step before embarking on the analysis itself.

3.1. Availability of Data for the Different Markets

Bearing in mind the description of the art market structure presented in chapter 2, it is straightforward to describe the availability of data for the different market levels. The availability is strongly connected to the visibility of the markets.

Generally speaking, it is impossible to get any kind of data from the **primary market**. As most transactions take place between private individuals, almost no institutional arrangements exist which would make systematic observation possible. Also, the large number of transactions, artists and possible dealers (mostly private traders) makes it well-nigh impossible to gather systematic data.

Regarding the **secondary market,** most researchers argue the same: namely, that it is a closed market with invisible transactions between private individuals and institutions that have no interest in the public airing of information about their prices or artworks. Some researchers have conducted personal interviews in order to gain some insights, e.g. Candela & Scorcu (2001) and Beckert & Rössel (2004), but there is no source for trading data (volumes and prices) relating to galleries or art dealers that is continuous over time. One exception is the Capital Kunstkompass, which will be focused on in chapter 3.4 below.

The situation as regards the **tertiary market** is clearer. For auctions there are presale catalogues presenting price estimates. After auctions, lists are published showing the auction results. This data is publicly available, and in addition there are professional services which offer access to what are known as auction price databases. At least for auctions there are quite a number of services which give sales data. These are listed in Appendix A. As the tertiary market also consists of international galleries and

dealers, it must be said that for these transactions it is also difficult to obtain detailed data, except from the Capital Kunstkompass.

3.2. Artist Information: Artcyclopedia

Before embarking on the research, a list of relevant artists had to be compiled. Generally speaking, data on artists is easily available from several sources: encyclopaedias, books on art history or the internet. In order to avoid bias in the subsequent analysis, a source had to be found that represents several art movements and covers the whole art market with the given selection of artists.

Artcyclopedia, which can be found under http://www.artcyclopedia.com, was used for this purpose. (Artcyclopedia: The Fine Art Search Engine, 2005) This source lists 1696 artists of museum quality from the Pre-Renaissance period to 20th century Modernism. Basic information about their life (birth and death dates) is stored there as well as their nationality and the artistic style they worked in.

Table 1 **Structure for Artist Data**

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.			1	1696
NAME	Name of artist.				
BIRTH	Birth of artist.	1851.99	91.635	1280	1979
DEATH	Death of artist.	1913.88	95.150	1344	2006
NATION	Nationality of artist.				
STYLE	Artistic movement and style.				

(own data)

The resulting list of artists was then used as the master table when working with the subsequent data. All artist information was centrally stored here, so that in the referred datasets only a reference with the artist ID was needed.

3.3. Auction Price Data: Hislop's Art Sales Index and the Artprice Database

Auction price data focuses, by definition, on the tertiary art market. Auction houses of a certain size publish pre-sale catalogues with information about the items on offer and the estimated prices. After auction the results are published in after-sale catalogues.

This mechanism makes it easy to follow the prices realized at auction. But there are also some problems. For example, when an artwork is not auctioned because the reserve price was too high it is called a "bought-in", which means that it was not sold by the auction house. The after-sale catalogues sometimes do not give any information about bought-ins; instead the lower price estimate is declared as the sale price. Another problem arises from the changing transaction fees charged by the auction houses over the course of time. The auction house is paid a fee by the seller and the buyer, this fee being calculated as a percentage of the volume traded. Since this charge has changed over time and is not printed along with the price realized, it is difficult to calculate on the basis of the prices stated in the catalogues.[10] A detailed discussion on the pros and cons of using auction data for analyzing the fine art market was carried out by Holub et al. (1993) and Guerzoni (1995). These can only be summarised here.

In 1674 the first auction in the form as it is known today took place in Stockholm's "Auktionsverket". Art was also auctioned there, but not according to a scheduled and seasonal time plan as is the case today. (Renneboog and Van Houtte, 2002) This changed from October 1973, where the Robert Scull auction took place at Sotheby's Parke Bernet, New York. There, for the first time, contemporary art was auctioned with financial success, resulting in a huge amount of media attention. From then on, the major auction houses started regular auctions focusing only on art and taking place on a scheduled basis in the auction year. For the first time, systematic recording of the prices realized was possible without substantial drawbacks, such as search costs.

The first attempts at recording prices realized at auction before 1973 were made by Reitlinger (Reitlinger, 1963, Reitlinger, 1970), who published books containing information about transactions from 1760 onwards. According to Guerzoni (1995) he selected "the best known painters of the world" who are deceased, relying mostly on transaction data from Christie's auction house. The data available from before 1880 is very sporadic and therefore seldom used. (Holub et al., 1993) The data from the period

[10] No description of the functioning of art auctions will be given here. Please see e.g. MOSSETTO, G. & VECCO, M. (2002) *Economics of Art Auctions,* Milano, FrankoAngeli s.r.l. for further details.

between 1880 and the 1960s has been used by many researchers since the beginning of research activities in the field of economics of the arts. In addition to this classic source regarding mainly historical transactions, there are today various sources for auction price data on CD-ROM and on the internet. They vary as to the focus of the recorded auctions and the criteria for listing. For a full overview, please see Appendix A.

Auction data is of the essence for the following analysis and provides valid information about the art market and the underlying transactions. According to Louargand & McDaniel (1991), in the future greater efficiency - especially in auction markets - will lead to greater liquidity, lower transaction costs and better information. This argument points towards the improved usability of auction data in the future (or indeed today, as the author's comment was written in 1991).

One data source used for the further analysis is Hislop's Art Sales Index (Hislop's Art Sales Index, 2006). It can be found as an internet database under http://www.art-sales-index.com and is also sold as a yearly CD-ROM publication. It covers the fine arts from 1920 up to the present and lists over 3 million transactions involving works by more than 250,000 artists. As a filter it lists only works beginning at a price of 250 USD.

Another data source used is the database of Artprice (Artprice.com, 2006). It is also available on the internet (http://www.artprice.com) and is sold as a yearly CD-ROM. It also covers the fine arts over a time span from 1987 until today. It has over 4 million entries of transactions and lists more than 306,000 artists. Older transaction data is only available as a book.

The available auction data for the artists given above was collected from these two data sources, digitalized and treated using the methods set out in chapter 3.6 below. As a result, the following information was obtained, which forms the basis of the analyses that constitute chapter 4.

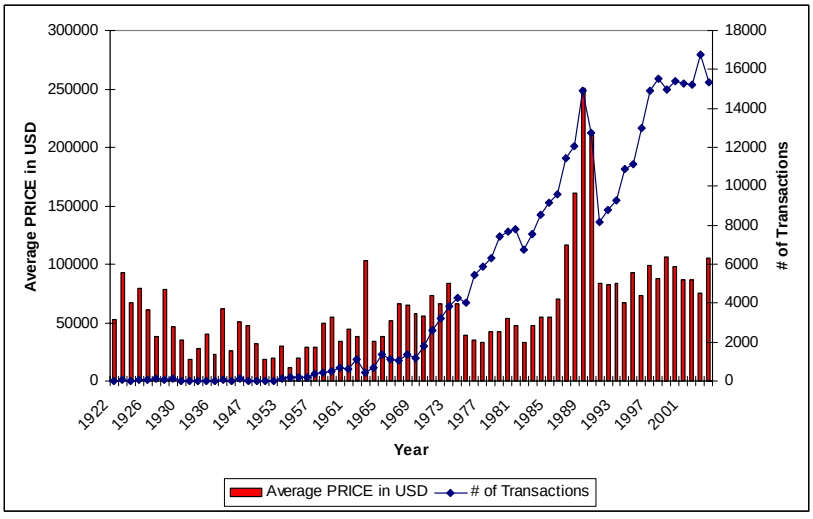
Table 2 Structure for Auction Data (1921 to 2004)

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.			1	1696
DATE	Date of transaction.			02.01.1922	31.12.2004
WORKNAME	Name of artwork.				
DESCR	Description containing various information about the artwork.				
LOT	Lot of the transaction.				
PRODYEAR	Year of production of artwork.	1928.63	65.623	1344	2003
MEDIUM	Medium of artwork (oil, water-colour, drawing, print, photo-graph, sculpture, …).				
SIZE	Size of artwork in cm^2.	5584.3	24819.935	9	998582
SIGNED	Signing information for artwork.	0.68	-	0	1
AUCHOUSE	Auction house of the transaction.				
AUCPLACE	City/country of the transaction.				
ESTMIN	Low estimate given in the pre-sale catalogue converted to USD and CPI	494900.26	8246994.38	1.44	87525087.14
ESTMAX	High estimate given in the pre-sale catalogue converted to USD and CPI.	587398.04	9614997.19	1.8	122535122
PRICE	Price realized at auction in USD and CPI.	90860.09	703011.268	206	98840274

(own data)

As can be seen here, the resulting data starts in 1922 and ends in 2004. The data from before 1956 is sporadic and has therefore been left out of most of the analysis presented below.

Figure 6 Average Price and Number of Transactions by Year (1922 to 2004)

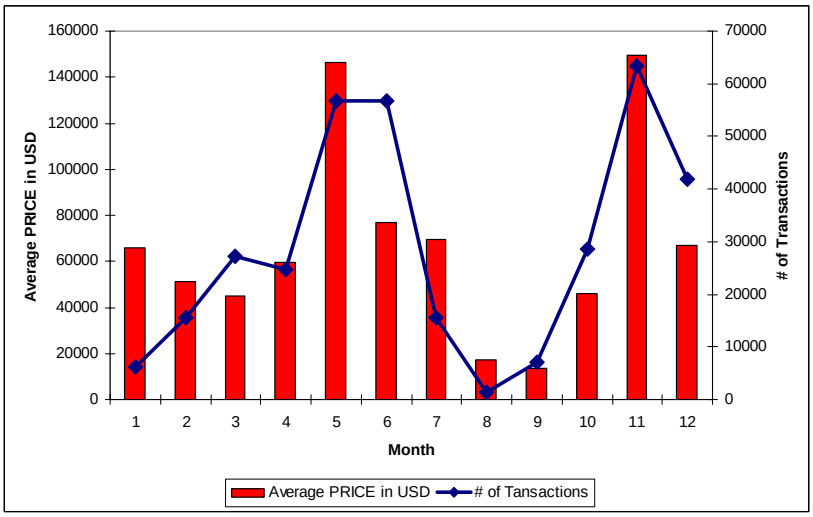


(own diagram)

As pointed out in some papers, a seasonal pattern of art auctions is also observable in this dataset. This seasonal pattern shows May, June and November to be the months

when the major auctions take place. This is quite as expected, since the major art auctions take place in these months.

Figure 7 Average Price and Number of Transactions by Month



(own diagram)

Altogether the sample contains auction data from 758 different auction houses in 36 countries. The 11 biggest auction houses accumulate over 75 % of the transactions covered by this dataset; these are namely Sotheby's, Christie's, Finarte, Guy Loudmer, Ader, Picard & Tajan, Hauswedell & Nolte, Blache, Phillips, Lempertz, Ketterer, Francis Briest, Kornfield and Villa Griesebach. The rest of the auction houses in the sample each have less than 1 % of the market share by transactions. The pattern of countries is quite in keeping with the figures presented in chapter 2.2 above. The sample includes five different media: Oil (42.7 %), Watercolours and Drawings (40.5 %), Sculpture (7.9 %), Prints (8 %) and Photographs (0.9 %).

In total there are 344,868 transactions involving works by the given 1696 artists in the auction dataset, which is an extraordinary source for the following analysis. There is no record in the literature of such a huge dataset ever before being used, and this is one of the special advantages of this thesis.

3.4. Gallery Prices and Reputation Index: Capital Kunstkompass

As previously mentioned, information about the secondary market is hard to come by. This is also true for prices and information about the reputation of artists. Fortunately, however, the Capital Kunstkompass has been in existence since 1970 (Rohr-Bongard, 2001).

The Capital Kunstkompass (CKK) was initiated in 1970 by Willi Bongard, a Cologne-born stock exchange analyst, journalist, publisher and active participant in the "Fluxus" movement. It is published every year in the November issue of Capital, a leading German business monthly, and parallel to the famous "Art Cologne" exhibition. Since 1985, the survey has been continued by Bongard's widow, Linde Rohr-Bongard. All the rankings between 1970 and 2001 were republished in the 30th edition of the survey in 2001. Starting in 2007, the publishing date of the CKK has been changed to June, as the "Art Cologne" has also changed its schedule to spring.

The main intention of the CKK lies in the construction of a **reputation** index, not unlike the citation indices used in the sciences. The participation of artists in exhibitions around the world is registered and ranked. Museum exhibits, one-man and group shows are distinguished, and points are awarded according to the quality of the event as determined by experts. Points are also awarded for reviews and articles in the most renowned international journals on contemporary art. The points are added up to establish a yearly total. These are accumulated over a series of years. The hundred artists with the highest scores are reported annually.

The reputation rank of CKK is then confronted with a **price** quote for a medium size work. The price quote is generated by a survey of dealers representing the ranked artists. Also, in analogy to the price to earnings ratio in the stock market, the ratio of reputation rank to price quote is shown in order to illustrate expected price performance in the future.

Over the years, there have been few changes in the system of calculating the ranking. There are no price quotes for the year 1970. In 1982 and 1985, CKK was not published. In 1980, 1984 and 1987 the top 100 focused on young artists under the age of 40. The aggregate prices should show a lower level for these years. In 1988, 1993 and 1999, a process of "rejuvenation" was undertaken, shortening the time span for the accumulation of points in order to give younger artists a better chance to move to the top. Since this change favoured younger artists, a downward shift of the price level must be assumed for these years.

The resulting data from the CKK has the following structure:

Table 3 Structure for Capital Kunstkompass (1970 to 2005)

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.			1	1696
YEAR	Year of the Capital Kunstkompass.	1989.114	10.621	1970	2005
POINTS	Reputation points for the artist.	11057.82	7600.70	150	64800
PRICEMIN	Minimum price in DEM/EUR.	101110.88	238499.26	8	4000000
PRICEMAX	Maximum price in DEM/EUR.	102260.71	268925.58	180	8000000
GALLERY	Main gallery of representation.				

(own data)

In total, 509 different artists were listed in the sample between 1970 and 2005. This data can be seen as a good proxy for information about transactions on the secondary market as well as information about the reputation of an artist.

For a more detailed discussion of the use of data from the Capital Kunstkompass please see chapters 4.1 and 4.3 of this thesis.

3.5. Measure of Popularity: Total Count of Google Hits

Google is currently the world's leading internet search engine. It relies on a search algorithm weighting the relevance of web pages on the internet with the term searched for and presents a list of matching search results and a number of total pages which probably contain relevant information.

In order to obtain information about the amount of media attention attracted by an artist and about the response of the public to this attention, the total number of hits reg-

istered by Google was used. According to Garcia-del-Barrio & Pujol (2007) who used Google to calculate the revenue-generating capacity (in contrast to the sporting capability) of Spanish football players, this seems to be quite a good measure to use for the arts sector. The information on the number of Google hits per search word is used as an approximate measure of the popularity of each artist.

Every hit on Google represents a web page dealing with the artist and his or her life or works. Hits may be biographical pages, information about exhibitions, information about the latest sales, excerpts from printed articles and so on. It can be assumed that nearly all printed information is "echoed" on the internet, so that an article in a famous newspaper, for example, is printed in a short version on the internet, is commented on in blogs or on other websites, and so on. Interestingly, with this mechanism there is a built-in automatic weighting of the information presented. Important on- and offline publications about an artist attract responses on the internet (in the form of links, citations, blog comments and other articles referring to the original). These responses are also listed by Google, thus increasing the total number of hits. The original information (one hit at Google) produces several more hits containing referred information on Google, enhancing both its own relevance and the popularity of the artist in general.

The resulting data has the following structure:

Table 4 Structure for Total Hits at Google

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.			1	1696
COUNT_EN	Count of total hits for artist at Google for search in English.	75540.89	301281.3	0	1772000
COUNT_DE	Count of total hits for artist search in German.	19467.59	63345.14	0	1275000

(own data)

The number of total hits on Google was accumulated for all 1696 artists. The number for COUNT_EN represents the number of total hits for the search term "'<artist name>' AND artist". The result for COUNT_DE stands for the search term "'<artist name>' AND künstler" to cover only results from German-language web pages.

This is the first time that popularity data has been used in this way in connection with the fine art market and/or artists. Hence, the use of this approach is another important aspect in fulfilling the aim of this thesis, namely to afford new insights into the fine art market.

Please see chapter 4.3 for a more detailed discussion of the use of Google data.

3.6. Collecting, Cleaning, Processing and Combining the available data

The presented data is available from different kinds of sources. The auction data comes on CD or is available on the internet. The Capital Kunstkompass is printed in the November issue of the German business journal Capital and was published as a book for the time span 1970 until 2001. The numbers of Google hits are also available on the internet. As the sources, the structure and the format of the presented data differ, special methods have had to be developed to prepare the data for further computing in a statistical way, e.g. with STATA or SPSS.

At first the collection of the data is relevant. The printed information from the Capital Kunstkompass was therefore typed manually into Excel and checked for validity and correctness by means of some simple arithmetical tests. The data provided on the internet was not manually copied into appropriate files due to the large amount of data and the time this would have required. Instead, this data was extracted from the internet in a semi-automatic manner. For this purpose, a JAVA program was written which "surfs" the internet and extracts the relevant information by means of what are called regular expression (REGEXP) operations. The results were then put into an Excel file which was cleared manually of any errors resulting from the automatic extraction.

In order to obtain valid and consistent data, a manual cleaning process nevertheless had to be carried out. The raw data was checked for spelling mistakes (which occur quite frequently in the named sources); the formats of numbers, dates and abbreviations were homogenized; and finally the names of all the artists were put into the same format so as to match the ID of the artists taken from Artcyclopedia. Also, currencies

were converted into USD using monthly and yearly average exchange rates from several sources, e.g. PACIFIC Exchange Rate Service (PACIFIC Exchange Rate Service, 2007) for conversions into USD from 1948 until today, the European Central Bank (European Central Bank, 2007) for conversions of European currencies into EUR or USD, FXHistory service (OANDA.com, 2007) and Historic rates service (fxtop.com, 2007) to cover the periods before World War II. In addition, inflation was taken into account and all prices were transformed on the basis of the year 2000. Thus, the consumer price index (CPI) and the "Inflation Calculator" from the US Department of Labor (U.S. Department of Labor - Bureau of Labor Statistics, 2007) were used, providing data from 1913 up to the present.

After cleaning and transforming the three datasets using the methods presented above, they were combined for further calculations. The presented artist IDs were used to match the data out of the four files. The results of chapters 4.1, 4.2 and 4.3 strongly benefited from this new approach of combining data sources.

A special word has to be said on processing the data with STATA or SPSS. Owing to the large amount of data, many of the calculations presented below require a lot of time when being processed in SPSS and STATA. In my experience, the calculations run best in STATA, as it is better suited to large-scale data processing. For testing purposes, it is nevertheless useful to reduce the size of a sample in order to improve performance.

3.7. Conclusion

The fine art market has several drawbacks relating to the visibility and usability of microeconomic data, especially in the primary and secondary market. This thesis employs different sources of data from the tertiary and secondary market over a large time span and analyzes a huge amount of data, the volume of which is unprecedented in the field of research on the fine arts. This data represents information about transactions and prices in the tertiary and secondary market, as well as about the reputation and popularity of artists. Combining these sources can result in new insights being gained,

as presented in chapter 4 below. The use of modern data processing facilities and the internet is one of the key factors making research on this scale possible.

4. Three Anomalies in Art Markets

The introduction provided a brief overview of the history of research in the visual arts and pointed out that new and interesting research topics need to be introduced into the academic world. In chapter 2 the basics of the art market and the concept of art as a good were presented, in order to gain an understanding of the complications and drawbacks of the arts and the market. Chapter 3 showed that with the use of new data for analyses of the art market there seems to be a possibility of obtaining new insights and exploring new areas of research.

The following three analyses will attempt to fulfil the desire to find three topics which permit in-depth analysis of the art market and also to prove the results empirically using the most "up-to-the-minute" data available.

4.1. Markets for Art: Different Pricing Strategies

In view of the explanations set out in the above, it would appear that the differences between the various segments of the art market are very large and that different dynamics may exist between these sub-markets. The purpose of the first analysis is to investigate the differences between the tertiary (auction) and secondary (dealer/gallery) art market.

(1) Introduction

This analysis tests a couple of hypotheses relating to markets where demand is not taken as a given, but subject to sophisticated and encompassing price-building strategies. It uses a rare set of time series data on dealer prices for the works of contemporary artists and it establishes significant differences to contemporaneous auction prices for works by the same artists.

The analysis first outlines the theoretical argument for such "constructed value markets", points to sociological evidence and formulates two hypotheses: (1) Prices for works of living artist in dealer markets increase steadily over their lifetime, while auc-

tion prices for works by the same artist are lacking such strict pattern. (2) a) The aggregate price level in dealer markets is higher than in auction markets for works of a particular artist. b) The dealer price index follows upward movements but shows resistance towards downward movements of the auction price index. Then it presents data collected by the Capital Kunstkompass and their correlates generated by auctions over the course of 30 years. The subsequent sections compare dealer price quotes with actual auction outcomes for works by the same artists. The results show that the prices for artists' works increase with age in both markets. The level of dealer prices is generally higher. The yearly price developments show similar upward patterns for both dealer and auction markets, but dealer prices are stickier in their downward movements. These results are consistent with the initial hypotheses.

(2) A theory of strategic preference construction

There are, in principle, two ways of increasing the market value of any commodity: one of them assumes elastic demand and increases market value by lowering cost and thus increasing the total number of commodities sold. The other assumes severely limited supply and raises market value by increasing demand for the fixed number of commodities available for sale.

The first approach corresponds to classical market theory since Ricardo. Markets for objects like "rare statues and pictures … and wines of a peculiar quality" (Ricardo, 1963) are explicitly excluded from consideration. Such exclusion is quite consistent with the basic model, even in its neoclassical formulation: if it is assumed that preferences of consumers are stable, it is inadmissible to assume, at the same time, that demand for certain items increases due to a change in subjective preferences. In the case of markets for rare pictures and wines sellers succeed in making a profit because they are able to change their buyers' preferences.

A recent study on art dealers in Amsterdam and New York provides more detail on the technique with which such value increases are attained. (Velthuis, 2005) Apparently, dealers follow a "price script" in their negotiations with prospective buyers. Rule

1 of the script indicates that the rare commodities are to be sold as entry tickets to a club whose members consist of all the artists and the collectors committed to a dealer's particular artistic quality judgment. Rule 2 indicates that the prices quoted for any work are to be increased at regular intervals, irrespective of actual sales. These results support a more general theory which explains why the market value for certain commodities increases systematically.

To start with, the commodities under consideration must be valued for their communication potential, as in the case of paintings or sculptures. Both types of objects might have material value as well, but the decisive characteristic is their ability to offer opportunities for conversations with others who share knowledge about the same class of commodities. A dealer's first task is to select out of a virtually infinite number of items with communication content those which show the highest potential for gaining the attention of a larger number of users. In the case of art works, the selection refers to certain styles of visual expression, and, within such styles, to the works of specific creators or artists. The attribution of the material works to particular authors assures an inevitable limitation of supply. As a second task, dealers have to convince buyers of the sustained artistic value of the works of a particular artist. Although each dealer works independently, there are network effects from a shared consensus among a dealer community as to which artists create works of the highest value. Such networks or "circuits" are asymmetrically ordered, with a few key dealers determining the general guidelines for selection. (Becker, 1984) To buy from such a dealer is an act that not only confers the property rights on an object, it also grants access to a club distinguished by a specific aesthetic quality.[11] As a third task, the dealers follow a price script which supports the claim that the appreciation of an artist's work grows steadily among an expanding audience. The price script has three major components: (1) Valuation is strictly determined by attribution to the artist and by the medium of execution,

[11] One of Velthuis' interview partners remarked with respect to Arnold Glimcher, the founder of Pace Gallery: "Buying from Pace is rather like membership in a club. Glimcher has this group of subscribers who are committed to his aesthetic, and they buy works by each of his stable of artists." See VELTHUIS, O. (2005) *Talking Prices. Symbolic Meanings of Prices on the Market for Contemporary Art,* Princeton, Princeton University Press.

like gouache, oil or engraving, and not by subject matter or other criteria related to the communication content. (2) Prices are never decreased. Often, a money-back guarantee is given. (3) Prices for all works by the artist are increased over time, even beyond the artist's lifetime. Irregular price hikes at the time of an artist's death reflect the fact that the number of potentially available works is now fixed.

To summarize, dealers in markets for goods with communication potential not only sell commodities, they actively create and provide a club good - namely membership in the community which adheres to the dealer's aesthetic style - which they sell jointly with the object. The dealers are not simply traders, they are above all service providers: they select, interpret, educate and signal with the aim of generating the belief that the appreciation of a particular set of new art works is constantly rising.[12]

However, the artificially constructed dealer markets are not exclusive. If the scheme is successful, derivative auction markets will emerge in which the same commodities are resold. The number of potential buyers may still be small, but auctions are an effective way to achieve transactions in markets where there may as few as a dozen potential customers worldwide. In the case of the most successful artists, media attention quickly increases the number of potential buyers. Auction prices have ambivalent effects on prices in the "dealer club" market: on one hand, they can confirm that the commitment of an audience to the artistic value of an artist's work has succeeded. The works achieve similar or, in select cases, even higher prices than in the secondary market.[13] On the other hand, the volatility of auction results - due to the randomness of buyers present at an auction session, and due to the asymmetry of media attention - en-

[12] A formal model which is able to capture the peculiarity of this club formation uses graph-theoretic form. (MIROWSKI, P. (2001) Postmodernism and the social theory of value. *Journal of Post-Keynesian Economics,* 13**,** 565-582., pp. 572) It assumes that market relations between buyers and sellers are not of the anonymous and fleeting nature as are transactions in a supermarket. Rather, every single exchange presupposes a social basis, i.e. a well-defined relation between the participants of a connection. All the agents in a market are nodes in a network connected by ongoing relationships between individuals or organizations that know each other well and have invested considerable trust in each other.

[13] In the primary market, living artists sell their works to dealers or collectors. In secondary markets, dealers sell works by living and deceased artists. In tertiary markets, owners sell works through auctions. For a description of the market hierarchy see THROSBY, D. (1994) The Production and Consumption of the Arts: A View of Cultural Economics. *Journal of Economic Literature,* 32**,** 1-29., p. 5 who limits the tertiary market to major international auction houses.

dangers the stability and sustainability of the dealer's price path for an artist's work. Both feedback loops connect the price developments in the two markets: there are no auction prices without prior price construction activities in the dealer market, and prices in the dealer market are influenced by auction prices.

Quantitative tests of price construction in dealer markets have not been conducted. There are not even studies on the relation of prices paid in dealer markets with prices paid in auction markets for the same works, or at least works by the same artist. Empirical studies of art markets rely almost exclusively on auction price data.[14] Thanks to the growth of data banks, auction data are abundant. Data on dealer prices, however, are difficult to obtain. Therefore, general statements about price formation and movement in visual arts markets implicitly assume that the price vector of an artist's works in the dealer market is simply a linear, scalar transformation of the respective price vector in the auction market.

To test for regularities in the pricing pattern of dealer markets, or for systematic differences between prices in dealer and in auction markets, it would be ideal to have data on actual dealer transactions. However, it is part of the dealer strategy to keep information about actual transactions secret. As a substitute, we have identified a data base that contains at least dealer price statements for the works of specific artists over three decades: The Capital Kunstkompass survey provides data on the reputation of 100 leading visual artists and on dealer prices for their works on a yearly basis, from 1970 until today.[15] By calculating "reputation points", the index follows the value signifiers of the art market scene. For the hundred contemporary artists with the highest number of reputation points, dealer prices for average size works are quoted. By combining the

[14] For current overviews on this topic see BURTON, B. J. & JACOBSEN, J. P. (1999) Measuring Returns on Investments in Collectibles. *Journal of Economic Perspectives,* 13**,** 193-212. or GINSBURGH, V., MEI, J. & MOSES, M. (2006) On the Computation of Price Indices. IN GINSBURGH, V. & THROSBY, D. (Eds.) *Handbook of Economics, Art and Culture.* London, Elsevier.

[15] The index was initiated in 1970 by Willi Bongard, a Cologne-born stock exchange analyst, journalist, publisher and active participant of the "Fluxus" movement. It is published every year in the November issue of Capital, the leading German business monthly. Since 1985, the survey has been continued by his widow, Linde Rohr-Bongard. All the rankings were republished in the 30th edition of the survey. See ROHR-BONGARD, L. (2001) *Kunst=Kapital. Der Capital-Kunstkompass von 1970 bis heute,* Köln, Salon Verlag.

data on dealer prices with the contemporaneous auction data for the same sample of artists, we can test for differences in the prices for works in the two markets.

The following study uses the data on dealer prices in the Capital Kunstkompass to compare price paths and price levels in the international dealer and auction market for contemporary visual arts from 1970 until 2004.[16] We test two hypotheses:

Hypothesis 1: Prices for the works of living artists increase steadily over their life-time, while auction prices for works by the same artist show no such strict pattern.

We test the steady-price-increase-hypothesis by comparing average dealer and auction prices for works by single artists at different points on their age curve over the course of their artistic career.

Hypothesis 2: a) The aggregate price level in dealer markets is higher than in auction markets for works by the same artist. b) The dealer price index follows upward movements but not downward movements of the auction price index.

The claim of higher prices in dealer transactions contradicts a popular opinion that auctions generate higher prices for art works. As has been shown in earlier studies, such perceptions are due to a few outlier results that capture media attention and thus provide anecdotal evidence for the impression of high prices.[17] If it is indeed true that dealers of contemporary art provide a joint product that includes club services, then prices for the joint product should be, on average, higher than prices for the bare objects purchased at an auction.[18] Moreover, if it is true that auction prices pull dealer prices upward, but that dealer prices are not constructed for downward mobility, then we should be able to observe corresponding patterns in the time series of the two indices.

[16] The reputation points of the index are awarded for appearances in international exhibitions and reviews, thus the sample of artists is international. Yet, there is a clear bias toward artists who originate in German-speaking art circuits. However, the bias is inconsequential for the questions under study here.
[17] The outlier effect has been demonstrated for prices paid for works by Marc Chagall in various media. See HOLUB, H. W., HUTTER, M. & TAPPEINER, G. (1993) Light and Shadow in Art Price Computation. *Journal of Cultural Economics,* 17 49-70.

Section 3 describes previous uses of Capital Kunstkompass. Section 4 specifies our data set. Section 5 reports results on the relationship between the age of artists and prices paid for their works in the two markets. Section 6 reports on the general price development in the two markets. Section 7 evaluates the results.

(3) Previous Uses of the Capital Kunstkompass

The main intention of Capital Kunstkompass (CKK) lies in the construction of a "reputation index", not unlike the citation indices used in the sciences. The participation of artists in exhibitions around the world is registered and ranked. Museum exhibits, one-man and group shows are distinguished, and points are awarded according to the quality of the event as determined by experts. Points are also awarded for reviews and articles in the most renowned international journals on contemporary art. The points are added up for a yearly total. They are accumulated over a series of years. The hundred artists with the highest scores are reported on a yearly basis. Over the years, there were few changes in the system of calculating the ranking.[19]

Reputation as measured by the CKK relies, in essence, on the judgments of experts. Experts have been shown to be accurate predictors for art markets. (Ashenfelter and Graddy, 2002) Therefore, the accumulation of expert appraisals in a single number is a reasonable representation of the value of an artist's works in their market. In the case of CKK, the resulting index shows a bias toward European artists.

The reputation rank of CKK is then confronted with a price quote for a medium size work. The price quote is generated by a survey of dealers representing the ranked artists. Also in analogy to the price/earning ratio in the stock market, the ratio of reputation rank and price quote is shown to illustrate expected price performance in the future.

[18] On the problem of determining the unknown volume of transactions in the dealer market, see the first paragraph of section 7.

[19] There are no price quotes for the year 1970. In 1982 and 1985, CKK was not published. In 1980, 1984 and 1987 the top 100 focused on young artists under the age of 40. The aggregate prices should show a lower level for these years. In 1988, 1993 and 1999, a so-called "rejuvenation" was undertaken, shortening the time span for the accumulation of points in order to give younger artists a better chance to move to the top. Since this change favored younger artists, a downward shift of the price level must be assumed in these years.

The way in which CKK selects and weighs the reputation points and the way in which the data from the secondary market are gathered has been criticized in trade articles and in scholarly works, e.g. Bonus & Ronte (1997). Despite its shortcomings, the CKK still provides a rare consistent measure for over three decades.

Economic researchers have been interested primarily in the reputation index. Schneider & Pommerehne (1983) were the first to use CKK reputation points as a proxy for the aesthetic valuation of artworks. With regressions for the years 1971-1978 they found that aesthetic value has a significant influence on the price of artworks. Grampp (1989) found that an increase in CKK reputations points of 10 % accounts for a price increase of 8 %. This result supports the thesis that expert appraisal is a good predictor for the prices of artworks in art markets. Singer (1990) extended the ideas of Schneider & Pommerehne with a study about the time an artist needs to move from the dealer market to the auction market. In this context, he used CKK reputation points to calculate the "artist capital stock" for every artist.

Recently, Beckert & Rössel (2004) used auction price and gallery price data combined with CKK reputation points to show that the value of an artist and his or her work is driven by a process of acquiring reputation through experts and institutions in both the auction and the dealer market. They used the CKK points as a measurement for value which is not based on the physical traits of the artwork but on artistic estimation. Using data from careers of artists in both the auction and the dealer market, they demonstrated the significant influence of reputation on the resulting price.[20]

With the partial exception of Beckert & Rössel, all the studies quoted use auction prices for determining the market value of works of artists. Auction prices are provided by auction houses and by special art auction data banks. The data can be verified because auctions are public. In consequence, these studies forgo the opportunity provided

[20] Just before this paper went into print SCHÖNFELD, 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,* 31**,** 143-153. published a model which suggests reasons for price restraint on the part of galleries with higher reputation, using the data on gallery prices in Beckert & Rössel as evidence. Given the fact that these data

by the second time series in the data set, namely the dealer price quotes. This study, in contrast, will use the CKK reputation points only to distinguish the artists in our sample from all the others. It will primarily use the series of dealer price quotes to investigate discrepancies with the related auction price data.

Our first test will distinguish prices for works of artists at different ages and compare the results for the two markets. The subject is not entirely new. Studies for the influence of the age of an artist on the price of his works in auction markets have been done by Galenson & Weinberg (2000) and by Landes (2000). The results show significant positive effects of age on prices and thus support Singer's "artist capital stock" hypothesis.

The second test compares price levels in dealer and auction markets between 1970 and 2004. Until now, no such studies exist. Candela & Scorcu (2001) have constructed a dealer price index for Italian prints and drawings between 1977 and 1999, but did not relate it to an auction price index.

(4) Description of the data set

Our data set registers the CKK reputation points of the visual artists with the 100 highest scores in all issues of the Kunstkompass as CKK_POINTS. The set extends from 1971 and 2004, with a total of 3192 observations on 442 artists. For the same 442 artists, the "average sized work" prices quoted in CKK are registered as CKK_PRICE.

For each of the years in which one of the 442 artists is included in CKK, auction prices for the artists were accumulated. In total, the data set contains 17216 auction transactions, carried out between 1971 and 2004. The average market values for each year and artist result in AUC_PRICE. Currencies were converted to US dollars and prices were deflated with the American consumer price index using 2000 as base year.

Thus, our total data set includes the following variables:

represent price lists from galleries in two cities only, and that the estimated coefficient is not significant, such interpretation is doubtful.

Table 5 Variables in Dataset

Variable	Description	MEAN	SD	MIN	MAX
ARTIST	Full name of artist				
AGE	Age of artist in the observed year	52.17	10.990	24	93
YEAR	Year of observation	1991.44	8.869	1971	2004
CKK_PRICE	Price of "an average sized" work of artist in the observed year indicated by CKK	120336.64	206785.34	489.12	3563384.52
CKK_POINTS	Quality points indicated by CKK in the observed year	13638.29	7431.15	1100	63160
AUC_PRICE	Average price of auctioned works for artist in the observed year	64911.79	229788.46	585	5372945.64
AUC_PRICE_QCM	Average price per cm^2 of auctioned works by artist in the observed year	11.1791	53.03	0.03	1378.05

(own data)

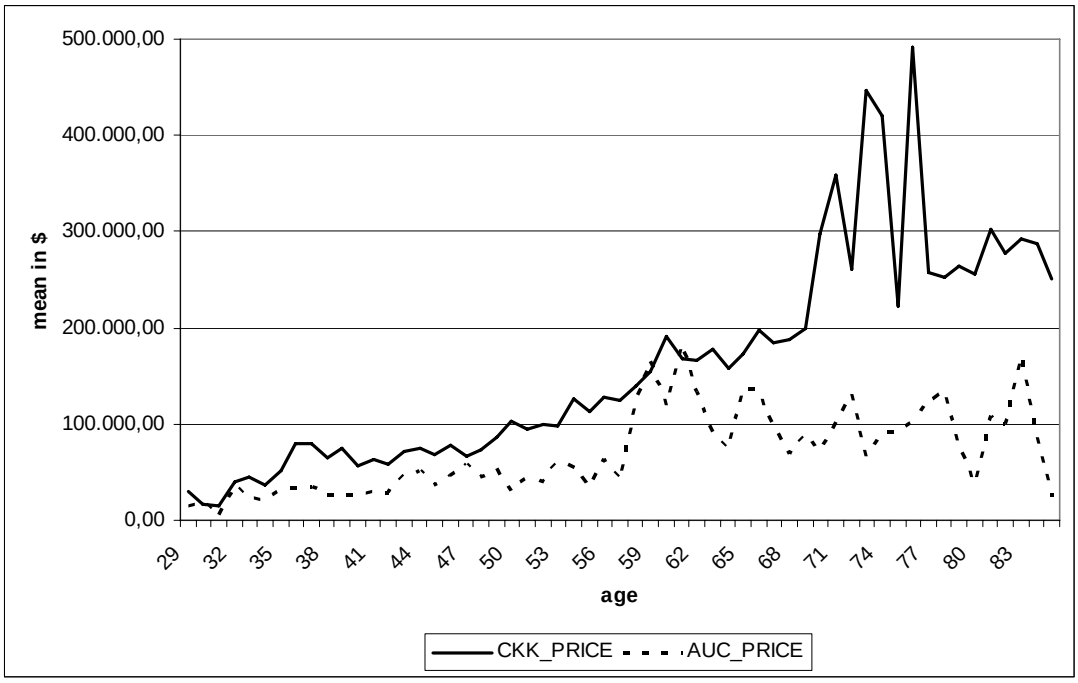
(5) Age of Artist and Price Development (H 1)

The relationship between the age of an artist at sale and the price at which his or her work sells in the two markets is the subject of our first investigation. For the test, we only used age values where prices for at least two artists are part of our sample. This leads to an age span from 29 to 85 years.

It can be observed that there is a distinct difference between dealer and auction price at all ages. Starting at the youngest age, dealer prices are at least twice as high as auction prices for works of the same artist. Between the age of 36 and 42, prices at galleries are on average 2.29 times higher. The gap widens gradually: between the ages of 50 and 57, the average price difference is 2.52, between 70 and 80 it is 3.85 times higher until the difference stabilizes beginning with age 81 at a level which is 3.99 times as high as the auction price.

A first result is the graphic representation of the two data sets in figure 8 where average prices per age of both markets are displayed.

Figure 8 Price Development at Different Ages in Dealer and Auction Markets



(own diagram)

The outliers in the data, notably around age 75 in dealer price and around age 60 in auction price, can be explained by small samples, by hidden effects of the art boom in the years 1989 and 1990 and by anomalies of the CKK. (see footnote 19)

The difference between the two price series is evident in graphic as well as in statistical comparisons. The data set has to be modified accordingly: a dummy variable AUCTION is introduced to distinguish between data from the auction market (1) and those from the dealer market (0), thus pooling all price data into a dependent variable called PRICE. Furthermore we built an interaction term between both age variables (AGE and AGE2) and AUCTION to control for different influence of age in both markets (INTER1 and INTER2). In addition, we use the reputation index called CKK_POINTS. This indicator is available in the CKK, and indicates the quality of the artist as mentioned. Assuming different influences of this variable in both markets we also used an interaction term, composed of CKK_POINTS and AUCTION (INTER3). To interpret the effects more easily, all variables have been centered. In running the estimation, we used the pooled data for simple linear regression (POOLED), random ef-

fects regression (RANDOM) and fixed effects regression (FIXED) controlling for artist specific heterogeneity. We have chosen the following econometric specification:

$$LN\_PRICE = \alpha 0 + \alpha 1(AGE\_Z) + \alpha 2(AGE\_Z^2) + \alpha 3(AUCTION) + \alpha 4(AGE\_Z*AUCTION) + \alpha 5(AGE\_Z^2*AUCTION) + \alpha 6(CKK\_POINTS\_Z) + \alpha 7(CKK\_POINTS\_Z*AUCTION)$$

Regression results are shown in table 6.

Table 6 Regression Results for LN_PRICE Corresponding to H 1

	POOLED	**RANDOM**	**FIXED**
AGE_Z	0.03253	0.07493	0.09535
	(3.06)***	(7.21)***	(8.44)***
AGE_Z²	0.00012	-0.00043	-0.00069
	(0.72)	(2.61)***	(3.94)***
AUCTION	-0.55463	-0.55463	-0.55463
	(2.50)**	(3.40)***	(3.42)***
INTER1 (AGE_Z * AUCTION)	-0.02503	-0.02503	-0.02503
	(1.66)*	(2.26)**	(2.27)**
INTER2 (AGE_Z² * AUCTION)	0.00020	0.00020	0.00020
	(0.86)	(1.17)	(1.18)
CKK_POINTS_Z*10^{-3}	0.04710	0.01709	0.01409
	(9.94)***	(3.59)***	(2.80)***
INTER3*10^{-3} (CKK_POINTS_Z * AUCTION)	0.02247	0.02247	0.02247
	(3.35)***	(4.56)***	(4.58)***
Constant	10.09768	9.22185	9.07289
	(64.43)***	(59.26)***	(53.85)***
Observations	3204	3204	3204
R-squared	0.33		0.39
Number of id		223	223
Absolute value of t statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

(own data)

According to the Hausmann-Test, unobserved heterogeneity is expected and the fixed effect model (FIXED) has to be chosen as the most appropriate. Altogether the regression shows highly significant influences of nearly all included variables.

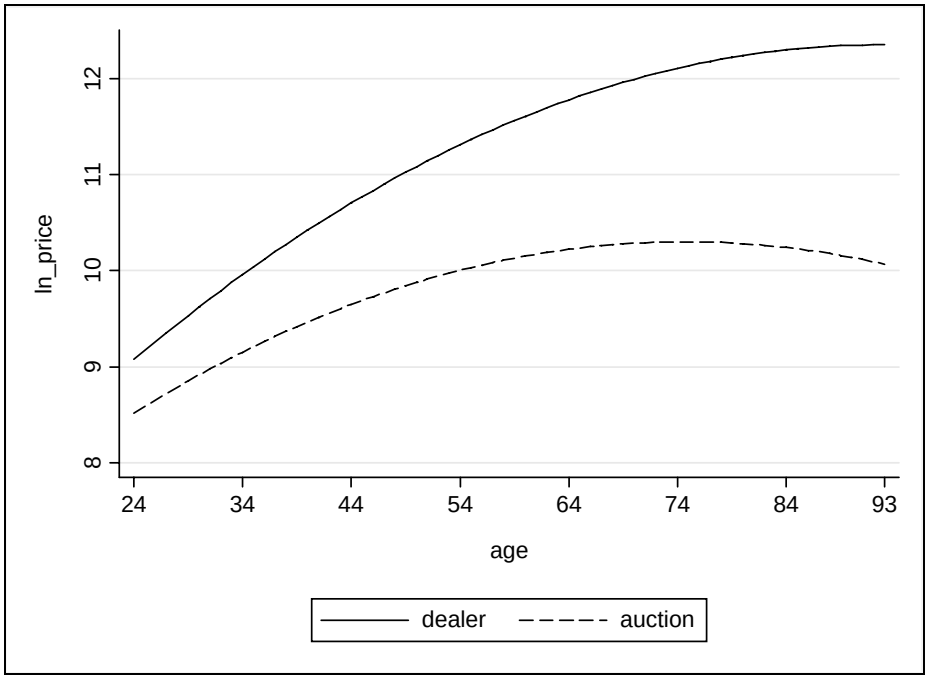
The influence of AGE_Z on auction and dealer prices results in a positive effect of 0.9535 % per year of age. The quadratic term AGE_Z² suggests a lower effect of age on price at higher ages. The negative effect of AUCTION suggests a generally lower price level in the auction market, confirming the observation of systematic differences

in the two price series. The interaction terms of AUCTION and AGE_Z and AGE_Z^2, respectively INTER1 and INTER2, measure the differences in change of price for the auction market when the artist gets older. With a negative influence of -0.0203 for INTER1 it is shown that in auction markets the age of an artist has less influence on the resulting price. Because of the very low influence of AGE_Z2 in general, the term INTER2 does not reach significant levels and is not relevant for our further considerations.

In order to control for the influence of the "artistic capital stock" we also tested for the influence of CKK_POINTS, as Singer (1990) had done. The assumed positive effect should show that reputation increases prices on both markets. The hypothesis is confirmed with highest significance levels with a factor of 0.01409, which means that an increase of 1000 CKK points results in a price increase of 1.409 %. A third interaction term (INTER3) measures the differences of this effect between both markets. A positive sign for this term would show that reputation is more important for the resulting price at the auction market than it is in the dealer market. This conjecture is confirmed with an influence level of 0.02247, which means that an increase of 1000 points in the CKK results in a total price increase of 3.656 % in the auction market.

To summarize the results: Prices increase generally with age in a nonlinear pattern, auction prices remain lower than dealer prices and the price increases due to age are lower in auction markets. The results are displayed by the regression plots of price on age for both markets in figure 9.

Figure 9 **Regression Lines for Influence of Age on Dealer and Auction Prices**



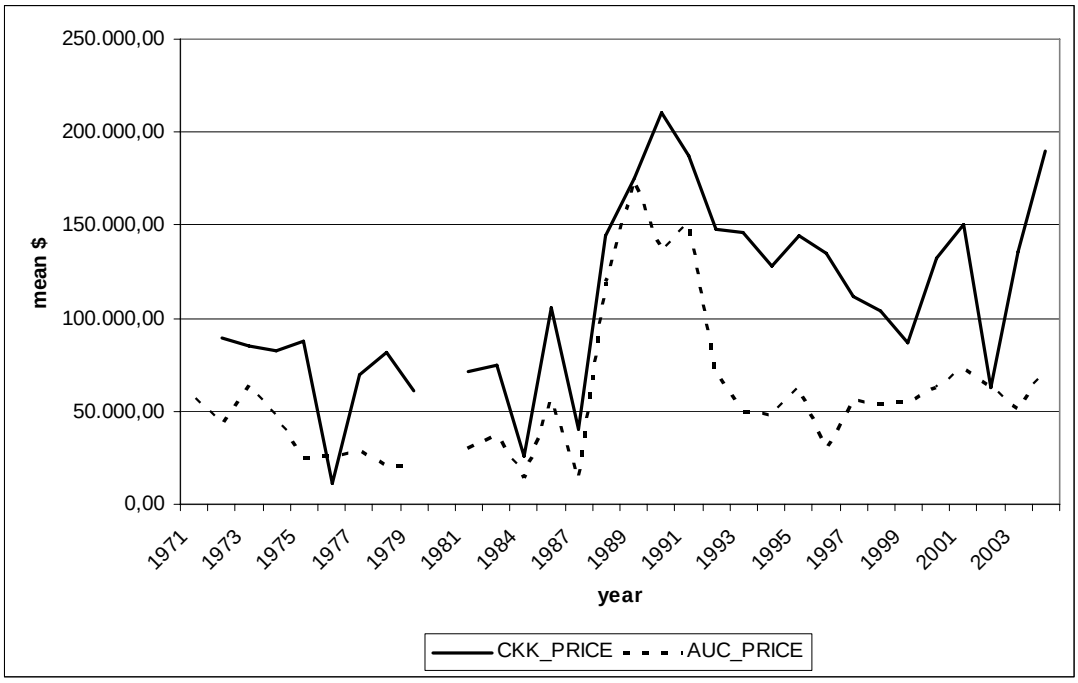
(own diagram)

(6) Differences of price level time series (H 2)

For our second test, we constructed simple indices by calculating the arithmetic mean value of the average dealer prices quoted in the CKK (CKK_PRICE) and the mean of the average auction prices (AUC_PRICE) of an artist's works by year.[21] The result is displayed in figure 10.[22]

[21] We left out the years 1970 and 1980 due to small sample sizes of only 5 and 2 data sets, respectively.
[22] The anomalies in the price development of the dealer market result from the peculiarities of the CKK mentioned in footnote 19.

Figure 10 Price Development from 1971 to 2004 in Dealer and Auction Markets

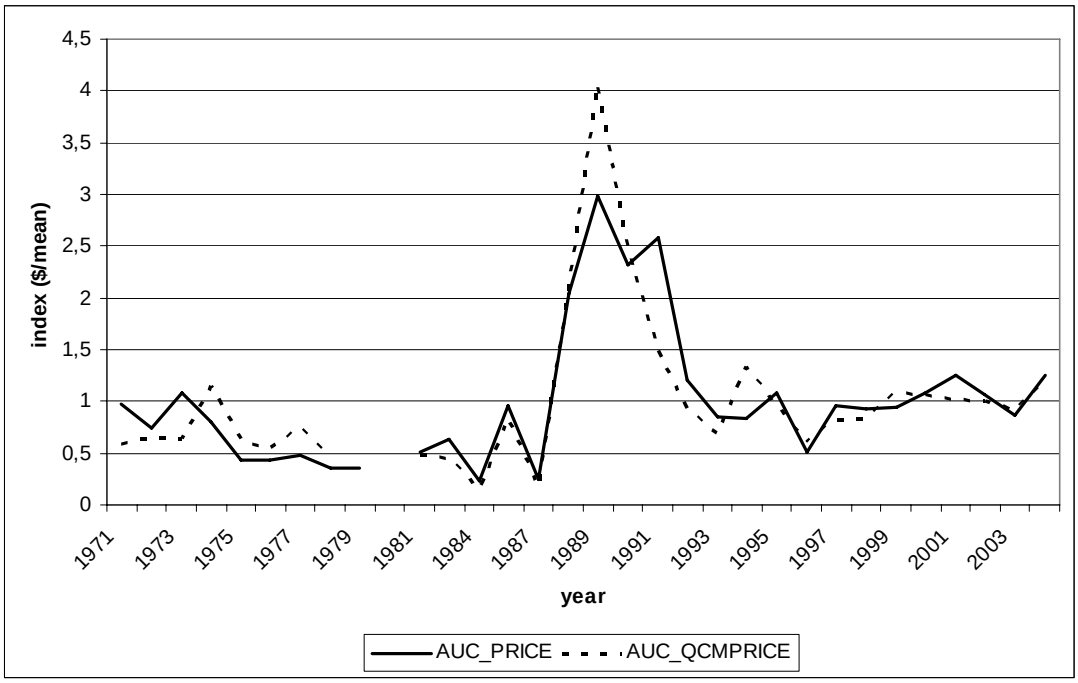


(own diagram)

In the years 1971 to1975, dealer prices were about 2.17 times higher than auction prices. Between 1977 and 1987, they were 2.54 times higher. During the art market boom, the difference was reduced to a factor of 1.25 on average. After the boom, the gap widened gradually. By 1996, dealer prices were 4.53 times higher than auction prices. From 1997 until 2004, the difference stabilizes at a level of 2.14 times above the auction price level, with the exception of a slump in 2002. Thus, prices in the dealer market declined much less after the boom years than they did in the auction market.

To check for comparability, we also calculated the average prices per cm2 (AUC_PRICE_QCM) for each year. In order to compare the auction market price (AUC_PRICE) to the standardized auction market price per cm2 (AUC_PRICE_QCM), we divided the yearly value by the mean value of all prices in the respective series to create a price index. The result, shown in figure 11, confirms the close similarity of the two auction price patterns and therefore the validity of our results.

Figure 11 Price Indices from 1971 to 2004 in Auction Markets



(own diagram)

In order to present statistical results regarding the different developments in the two markets, we used yearly regression variables to construct a hedonic price index. We included the dummy variable AUCTION to find general differences in the price level of both markets. We also included CKK_POINTS to account for reputation as an influence on the resulting price. INTER4 represents the assumed difference of the influence of CKK_POINTS in the auction market. Finally, we used yearly dummy variables for both markets (YEAR_D1971 until YEAR_D2004) and combined them with AUCTION to account for general differences between the developments of both markets (YEAR_D1971_INTER until YEAR_D2004_INTER). 2003 is the base year for this index.

The regression is constructed as follows:

$$LN\_PRICE = \alpha 0 + \alpha 1(AUCTION) + \alpha 2(CKK\_POINTS\_Z) + \alpha 3(AUCTION*CKK\_POINTS\_Z) + \alpha 4(\Sigma YEAR) + \alpha 5(AUCTION*\Sigma YEAR)$$

The regression results are displayed in table 7. Again, the Hausman-Test advises to use the fixed regression results (FIXED).

Table 7 Regression Results for LN_PRICE Corresponding to H 2

	POOLED	**RANDOM**	**FIXED**
AUCTION	-0.93449	-0.93449	-0.93449
	(5.58)***	(8.76)***	(8.83)***
CKK_POINTS_Z	0.05291	0.02330	0.02038
	(11.59)***	(5.70)***	(4.79)***
INTER4 (CKK_POINTS_Z * AUCTION)	0.02023	0.02023	0.02023
	(3.13)***	(4.92)***	(4.96)***
YEAR_D1971 - YEAR_D2004	[23])		
YEAR_D1971_INTER - YEAR_D2004_INTER			
Constant	11.18519	11.09628	11.45471
	(94.41)***	(117.72)***	(146.29)***
Observations	3204	3204	3204
R-squared	0.38		0.58
Number of id		223	223
Absolute value of t statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

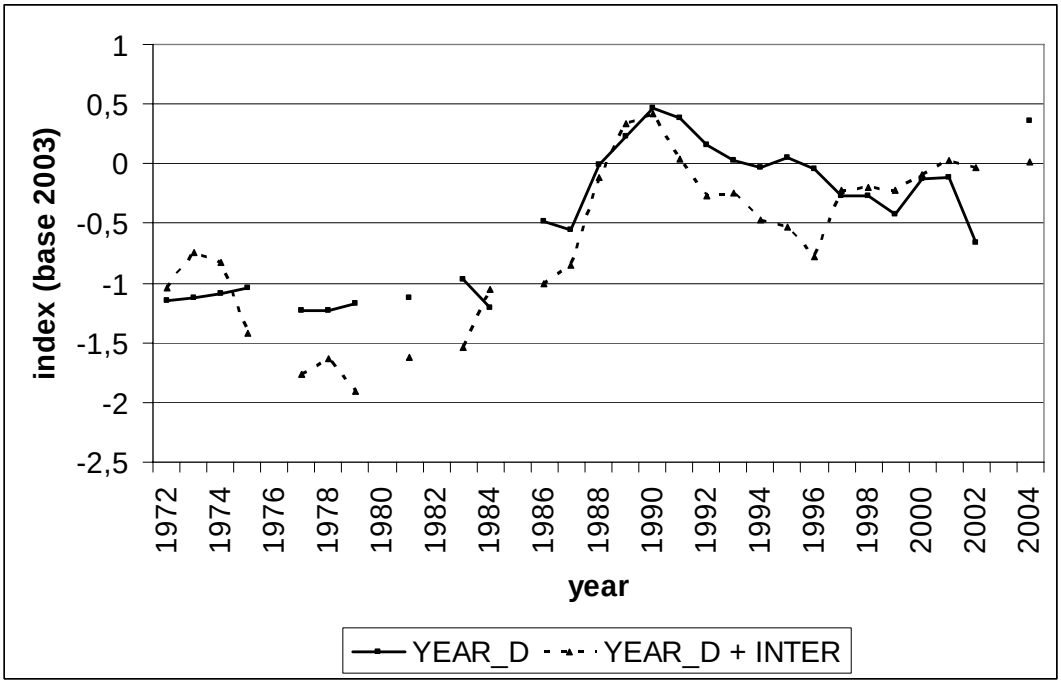
(own data)

This regression also confirms at highest significance level that the price level is generally lower in the auction market, with an influence of -0.93449. The influence of CKK_POINTS (0.02038) and INTER4 (0.02023) confirms the result that the reputation points of CKK have a positive influence on dealer and auction prices.

To graphically exploit the results of the regression and the resulting hedonic price index we printed the yearly dummies (price index for both markets) and the interacted yearly dummies (price index for the auction market) in figure 12.

[23] Detailed regression results are omitted here as they are plotted in figure 12. Please contact the author for more detailed information.

Figure 12 Hedonic Price Indices from 1972 to 2004 (2003 as reference)



(own diagram)

With the exception of the years 1971 and 1976 (omitted in figure 12), the resulting price index shows a quite detailed picture of price development in the art market of the last 30 years. As described before, the auction prices are generally lower than the dealer prices. Around the art market boom 1989/90, the prices come closer together, after the "crash", the gap widens beyond its former extent.

(7) Interpreting the Results

In interpreting the results of both tests, one must first take into consideration the quality of the data. Auction data reflect actual sales, even if there is a margin of manipulated transactions. The dealer data, on the other side, are figures released by an interested party, namely the potential sellers. Dealers have an interest in overstating their prices because prices are interpreted as indicators of demand. They quote their starting points in a bargaining game where the final price includes discounts and long-term arrangements, like deferred payments. In addition, we do not know the factual volume of dealer sales. We can only simulate the volume of artist-specific dealer transactions by using the number of corresponding auction sales as a proxy. A further problem could be sample selection bias: when registering the works of a particular artist sold in a

given year, the auctioned paintings tend to be "older" than the ones sold through dealers. There is mixed evidence in research about the connection between the time of execution and prices paid for works at a later point in time (Galenson & Weinberg (2000), Edwards (2004) and Galenson (2005)). Such considerations must be kept in mind, but they do not invalidate the significance of the differences between the two markets as registered in our two tests.

The age-price profile reported in section 5 supports Hypothesis 1: systematic price increase scripts are pursued in the dealer market. While auction prices show a moderate increase in prices for works of artists past the age of sixty, dealer prices climb steadily starting in earlier ages around thirty on an aggregate level (figure 8). The trend continues past the age of eighty, even if the price data show a less clear picture in the bracket of age 70-80.

The price level time series reported in sections 5 and 6 contain several insights with respect to Hypothesis 2a: Price levels in the dealer market were, on average, about twice as high in dollar value as corresponding auction market price levels.

Hypothesis 2b is supported by comparing the two price levels since 1971: Prices in the dealer as well as in the auction market were pushed up in the late 1980s. The reasons for the push were mostly external: liquidity among potential traditional buyers was unusually high and new groups of buyers entered especially the auction market. (Hiraki et al. (2003), Wieand et al. (1998)) Within two years, the mean dealer price increased by a factor of over 4, while the mean auction price increased by a factor of about 3 at its peak. Dealer prices were then only about 1.25 times higher than auction prices. When liquidity dried up and media attention ceased, auction prices adjusted quickly downwards to a level 1.6 times higher than before 1988. Dealer prices, however, took a decade to come back to a level 1.5 times higher than in the late 1980's.

This supports the claim that price scripts without tolerance for declining prices were successfully at work and held up the market price during that decade.[24]

We therefore conclude that the behaviour registered in dealer art markets provides evidence for an alternative strategy of raising market value by changing the preferences of consumers with respect to a fixed supply of particular goods with communication potential. Thus, standard price theory is expanded: Neoclassical price theory predicts that markets generate, in equilibrium, one price for any specific good. There may be adjustments for distance, lack of information, quality of services, economies of size for wholesale operations etc., but once these factors are taken into account, one equilibrium price remains. When the commodities on the market have immaterial communication properties, and yet are limited in supply, they can be used as the basis for a club good that forms a joint product with the ownership of the object. As a result of the club activity, preferences for the works of selected artists are changed in such a stable way that the media and their audiences accept these valuations and thus trigger correspondingly high prices in auction markets. The buyer acquires the object in a potentially anonymous transaction, and with the object comes the artistic valuation generated in the preceding dealer market. The conjecture of such generated or constructed valuations explains a significant part of endogenous preference change, in Art markets as well as in other markets for consumption goods.

4.2. Supply and Demand on the Art Market: Death-Effects

The second analysis will take a closer look at supply and demand dynamics in the auction market, as they are of special relevance for the arts as described in chapter 2.3.

Using a large and representative data set covering some 560 painters for whom we collected information on nearly 266,000 auction sales in the years 1959-2003 we demonstrate the existence of a "death effect" for a particular sub-group of these artists. When we distinguish between average and star painters as well as between an anticipated and an unexpected death we find a significant price increase immediately after

[24] We ignore the indications in the data that point to a new art boom starting around 2004.

the death of the "stars", but not the "average painters". Moreover, prices tend to revert to the pre-death level rather soon even for the works produced by star painters. We attribute this finding to a "nostalgia effect" resulting from media attention surrounding the death of more popular artists.

(1) Introduction

There is widespread belief among economists as well as art lovers that the death of an artist leads to a substantial increase in the prices of artworks produced by that person. This "death effect" is usually attributed to expectations on the part of art collectors concerning the future supply of that particular artist's works (Matheson and Baade, 2004). Since the value of an artist's work is partly a function of the number of his works and since an increase in supply will cause prices to fall, the question arises, whether an irreversible stoppage in production will lead to a particular price reaction.

Our study uses a very large dataset (see section 4) to analyze the impact of an artist's death on the development of auction prices. The data set covers a period of 45 years (January 1, 1959 - December 31, 2003) and includes more than 265,000 transactions of the works of some 560 artists. As an extension to the available studies (section 3) we distinguish between two particular groups of artists - the "average painters" and the "star painters" (i.e. persons whose works have been included in the 2004 exhibition of the Museum of Modern Art in Berlin) - and find that the price reactions are significantly different for these groups. Moreover, our analysis is the first to distinguish between the effect of an anticipated and an unexpected (sudden) death (we use different time windows around the death of an artist to estimate various regression models). Again, our estimations lead to significantly different results for the two groups of artists as well as for the different time windows.

The analysis proceeds as follows: Before turning our attention to the available literature, we first consider a possible death effect as the result of the interaction of supply and demand factors in the market for artworks (section 2). We conclude with a

summary of our most important findings and some implications for further research (section 5).

(2) Artists as Durable Goods Monopolists: Some Theoretical Considerations

Whether an artist's death affects auction prices for that person's works or not depends, in general, on supply and demand conditions in the relevant market. These conditions, however, are clearly and substantially affected by information concerning the past and future conditions of that particular market. The changing demand for an artist's works depends, inter alia, on the current average price for that person's artistic output, on the price of alternative artworks as well as alternative investments, on the expected future price of art, on income and - of course - on tastes and preferences.

Moreover, expectations concerning the future supply of artworks by a particular person also tend to influence (auction) prices: The value of an artist's work is a function of the number of his works, and, as with every good, an increase in supply will, ceteris paribus, lead to a decrease in price. A collector who buys a painting or a sculpture of a living artist must take into account that the artist may produce additional (similar) works in the future which will reduce the price of the purchased artworks. Thus, the prospect of a future increase in supply tends to reduce the current price of the works produced by living artists. The economic implications of this phenomenon have already been addressed some 35 years ago by Ronald Coase (1972) analyzing the problems faced by a "durable good monopolist".

An artist whose works are in high demand cannot credibly commit not to increase his production. The contractual and/or institutional arrangements that can be thought of in this context (an agreement not to produce anymore artworks, an offer to buy back the artworks at any time in the future, or the use of leasing rather than outright sale) are either not legally enforceable or involve (prohibitively) high costs.[25] The death of an

[25] An additional alternative is to make the good less durable: "If a less durable good is produced, a higher price can be charged because consumers do not have to fear that an increase in supply if they have to buy at the monopoly price. ... The reason why making a good less durable enables a producer to charge higher prices than he could if the good were extremely durable is that it makes it in his self-interest not to increase

artist removes the threat of a future increase in supply and therefore leads to an increase in the price of an artist's works. Moreover, old age and/or serious illness can also increase that value of an artist's works as these factors might also reduce the expectations of future output: "...death, and perhaps, anticipated death is, in effect, highly significant in the price history of artists because they are, in part, durable good monopolists - that is, 'monopolists' who can only extract 'competitive' or quasi-competitive returns for their art over their lifetimes." (Ekelund et al., 2000).

Thus, in the absence of an enforceable and durable arrangement between artist and art collectors that prevents the artist from "spoiling the market" by producing more and more artworks of a similar kind, prices - and therefore returns - will remain at the competitive level. However, "at death, an artist's output ends and a finite quantity of works are (potentially) available for sale in galleries and at auctions" (Ekelund et al., 2000). Moreover, "an increase in demand and prices takes place in anticipation of death due to the anticipated certainty that values will not be reduced by increased production or supply rates of an artist's work" (Ekelund et al., 2000).

Summarizing, a "death effect" is said to occur if (and only if) the prices for artworks produced by the deceased artist that have been auctioned around the person's death were significantly higher than they used to be. "...the death effect is a demand rather than a supply phenomenon. It is not fixed supply per se, but the after death certainty that a supply or a supply-rate will be reduced to zero that stimulates demand for an artist's work. In short, the demand problem facing the durable good monopolist may be applicable to artists as well" (Ekelund et al., 2000).

Matheson and Baade (2004) in their empirical analysis find that in the years following the death of a prominent athlete, the prices of sports memorabilia first increase and then decline, maintaining a slightly elevated level relative to the years prior to death. Since a similar finding has also been reported by Ekelund et al. (2000) in their analysis

supply since, if he did this, it would tend to lead consumers to believe that he might do this again in the future, a belief that makes it impossible for him to charge the monopoly price" (see COASE, R. (1972) Durability and Monopoly. *Journal of Law and Economics,* 15**,** 143-149., p. 147).

of 21 Latin American artists who died between 1977 and 1996, the former authors reject the notion of a "death effect" in favor of a "nostalgia effect". If the death effect is solely due to changed perceptions about future supplies (i.e. the elimination of the durable goods problem), a lasting impact on auction prices should occur. If, however, only a short-term peak can be observed, another explanation is required to account for the subsequent decline in prices. Matheson and Baade (2004) suggest that "the media attention that surrounds the death of a prominent artist or another notable figure increases the public interest in the person and the person's life and works. ... If this public interest is short-lived the increase in prices will result in a 'nostalgia spike', where prices increase immediately after the death of the celebrity but then fall back as the celebrity's death recedes into the past". Thus, a decline in the price of art works is inconsistent with the "durable goods monopolist effect", but compatible with the idea of a "nostalgia effect".

In an attempt to discriminate between these two effects we distinguish "average" and "star" artists. If the nostalgia effect dominates the durable goods monopolist effect, the changes in auction prices following the death of an artist should be more pronounced for the latter group as star artists passing away certainly receive more attention by the media which, in turn, may cause prices to increase. If, on the other hand, the durable goods monopolist effect dominates the nostalgia effect, the increase in auction prices should be of a permanent nature.

(3) Review of the Literature

So far, only a small number of studies exist that try to identify the "death effect" (see table 8).[26] To the best of our knowledge there are five studies using data from art auctions (Agnello and Pierce, 1996, Czujack, 1997, Ekelund et al., 2000, Agnello,

[26] A different, yet related type of empirical studies looks at the impact of sudden (and therefore unexpected deaths) of chief executive officers on abnormal stock market returns (see JOHNSON, B., MÁGEE, R. P., NAGARAJAN, N. J. & NEWMAN, H. A. (1985) An Analysis of the Stock Price Reaction to Sudden Executive Deaths. *Journal of Accounting and Economics,* 7**,** 151-174., WORRELL, D. L., III, W. N. D., CHANDY, P. R. & GARRISON, S. L. (1986) Management Turnover through Deaths of Key Executives: Effects on Investor Wealth. *The Academy of Management Journal,* 29**,** 674-694. and HAYES, R. M. & SCHAEFER, S. (1999) How much are differences in managerial ability worth? *Journal of Accounting and Economics,* 27**,** 125-148.). We return to the results of some of these studies below.

2002, Higgs and Worthington, 2005) and one study using information on deceased sports celebrities (Matheson and Baade, 2004). Unfortunately, all these studies use rather small samples: Czujack (1997) studies the development of auction prices for Picasso paintings only (n=921). Ekelund, Ressler and Watson (2000) analyze a sample of 21 Latin American Artists, Higgs and Worthington (2005) study price reactions for 60 Australian artists, Agnello and Pierce (1996) for 66 American artists and Agnello (2002) for 91 American artists.

Summarizing, the findings reported in these studies are quite contradictory: While Agnello and Pierce (1996) as well as Czujack (1997) fail to find a death effect, Higgs and Worthington (2005) report a statistically significant, but economically small impact of an artist's death on auction prices. Moreover, Agnello (2002) attributes the surprisingly large death effect he finds in his data to the particular mix of styles and artists in his sample. Thus, apart from the paper by Matheson and Baade (2004) who find a modest increase in the prices of trading cards of deceased Baseball players, only Ekelund, Ressler and Watson (2000) report a significant "death effect". Their paper, however, clearly suffers from a sample selection bias (they include only Latin American painters) and a very small sample size (n=630 paintings only). Thus, it is not yet clear whether the findings can be generalized to the rest of the art market.

Table 8 Survey of the Available Evidence

Author(s) and Year of Publication	Data Sample and Data Source	Major Findings
Agnello and Pierce (1996)	Sample: 66 American artists whose works have been auctioned between 1971 and 1992. Four of the artists died during the observation period, eight were still alive in 1992. Source: Hislop's "Annual Art Sales Index" (n=15,216 observations).	While the average nominal rate of return in art investment was about 9% for the whole sample, it was slightly higher for the deceased artists (14%, min. 11% and max. 18%), suggesting the existence of a death effect. However, the rate of return of the works of the artists still alive at the end of the period was even higher (18%, min. 2% and max. 26%).
Czujack (1997)	Sample: All paintings by Pablo Picasso that have been sold at auctions between 1963 and 1994. Source: Mayer's "Annuaire des Ventes" (n=921 observations).	Between 1973 and 1976 a price increase for Picasso paintings can be observed (the artist died in 1973) while the market showed no comparable change in that period, suggesting that the artist's death had a positive effect on prices for a few years. However, that difference was even more pronounced in the years 1982-1994, i.e. long after Picasso's death.

Ekelund, Ressler and Watson (2000)	Sample: Auction house sales records for 21 Latin American artists who died between May 1977 and November 1996. Source: Nader's "Latin American Art Price Guide" (n=630 paintings).	As the year of a sale moves away from the year of death of an artist, the prices of his paintings fall significantly. This, in turn, suggests the existence of a "death effect" defined as a clustered increase in artists' values immediately preceding death.
Agnello (2002)	Sample: 91 American artists whose auction transactions have been published for the years 1971-1996. Source: Hislop's "Annual Art Sales Index" (n=25,217 observations).	Being alive at the time of the auction is associated with a significantly negative effect on price (-21%). This, however, is likely to be the result of a particular mix of artists and styles in the sample and not necessarily indicative of price increases associated with the death effect.
Matheson and Baade (2004)	Sample: Baseball cards of 13 players who died between January 1991 and February 2001 and had been selected to the "Baseball Hall of Fame". Source: Beckett Services (n=259 observations, because the number of cards per player varies between 4 and 42).	The prices of cards of the deceased players increased compared to cards in general in nine out of 13 cases and declined only for three of the 13 athletes, suggesting the existence of a "nostalgia effect". In each of the cases where individual players experienced a decline in card prices, none of the declines was statistically significant. In eight of the nine cases where the Hall of Famers experienced a relative increase in their card prices, this increase was statistically significant.
Higgs and Worthington (2005)	Sample: 60 Australian artists whose paintings have been sold at auction over the period 1973-2003. 39 of them were deceased before the auction date. Source: Australian Art Action Records (n=37,605 paintings).	A deceased artist at the time of the auction is associated with a statistically significant price increase of 1.13%

(own data)

Another strand of literature that deserves being mentioned in this context looks at the impact of unexpected deaths of CEOs (i.e. car accident, heart attack, etc.) on the market values of their firms. Hayes and Schaefer (1999) for example find that when controlling for age and tenure of the CEO firms losing their managers to other firms experience an average abnormal return of -1.5% while firms whose managers die suddenly experience an increase in share prices of 3.8%. Worell et al. (1986) come to a completely different conclusion: In their sample the sudden death of a CEO is associated with a 2.7% decline in the cumulated abnormal returns over a seven day period. Thus, while these differences in returns across groups reflect differences in the value of managerial ability, the results remain inconclusive. However, the findings seem to suggest that the capital market does evaluate the abilities and/or the performance of deceased managers in a particular way.

(4) Data and Empirical Findings

Our data is particularly large and includes all artists who are either mentioned in one of the annual editions of "Capital Kunstkompass" (Rohr-Bongard, 2001) in the years 1970-2004 or are listed on "Artcyclopedia" (Artcyclopedia: The Fine Art Search Engine, 2005). For that group of artists we have information on more than 265,000 transactions, including the medium (oil on canvas, watercolor or prints), the size (m squared) and the price at which the artwork was sold (auction prices were deflated by the consumer price index for the year 2000 for the country in which the auction was held and national currencies were transformed into US$ by using the exchange rate of the month in which the auction was held). Moreover, we add to the data set information on the artist's year of birth and, eventually, the year of his/her death. Table 9 provides information on the composition of the sample and on the steps we have taken to construct our final sample.

Table 9 Construction and Composition of the Sample

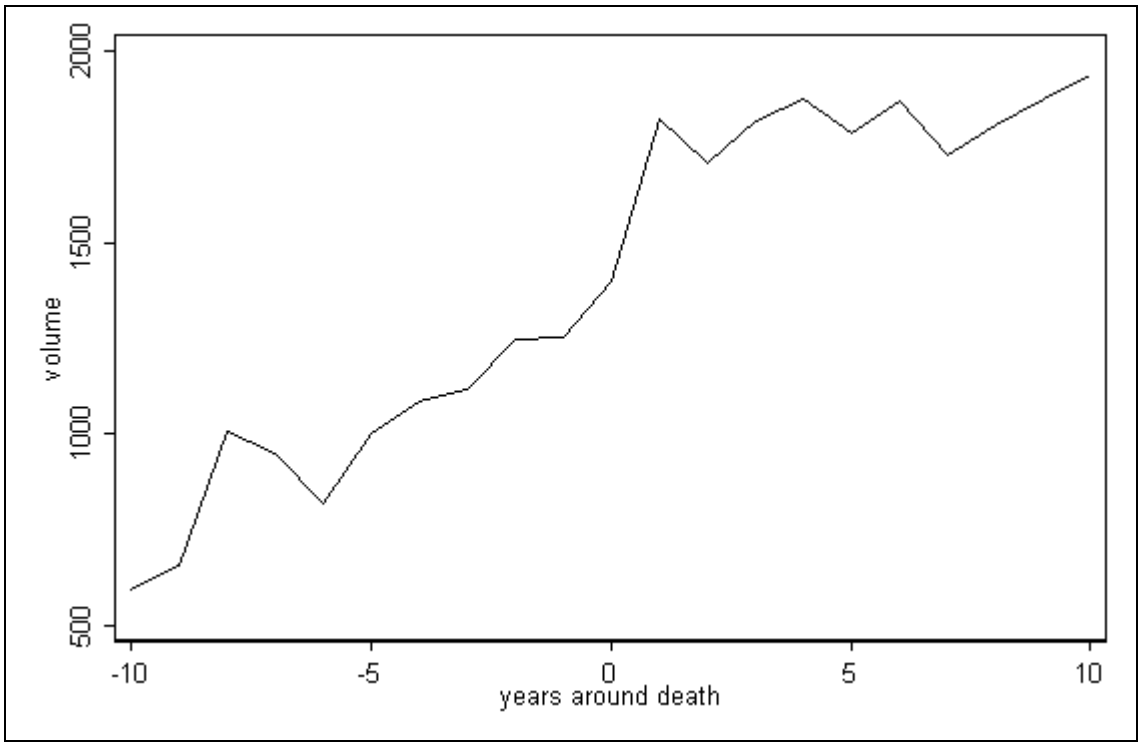
Sample composition	Number of Artists	Number of Transactions
Step 1: Assembling complete auction data for all artists who are listed in the "Capital Kunstkompass" in either of the editions 1970 - 2004 as well as on "Artcyclopedia" results in … cases	1,696	344,868
Step 2: Deletion of all transactions that occurred before 1959 leaves us with … cases	1,599	342,612
Step 3: Deletion of all artworks where information on size is missing leaves us with … cases	1,522	297,892
Step 4: Deletion of all artists for whom less than 100 transactions have been recorded leaves us with … cases	560	265,881

(own data)

We first present some descriptive evidence on the demand for the artworks of deceased artists. It appears from figure 13 that one year after a person's death the demand for his/her artworks increases steeply and remains at that rather high level in the first five years after that person's death. This immediate and sharp increase is surprising insofar as there is some "noise" in our data that is likely to distort the relationship: Unfortunately, we have only the year of death for the artists in our dataset and no information on the exact dates. This means that in some cases the works of an artist might have

been sold at an action when he was still alive while we have classified him as deceased in our analysis.

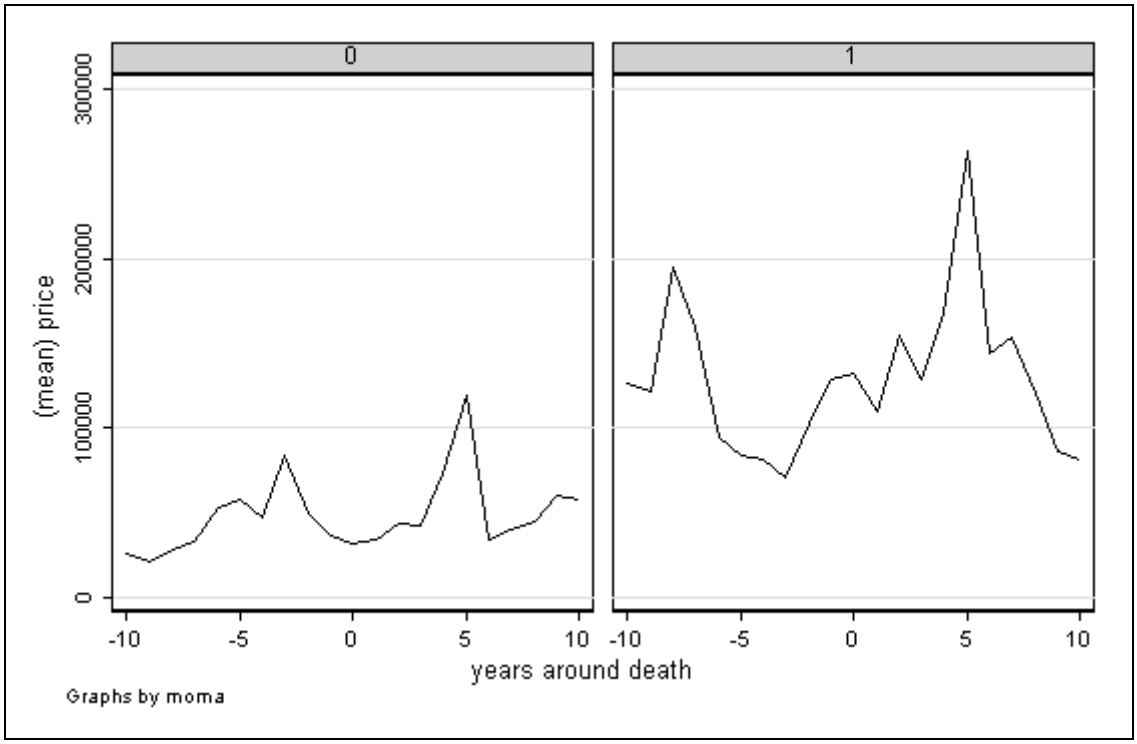
Figure 13 Volume Traded Around the Death of Artists



(own diagram)

Looking at the prices of the artworks traded immediately after the death of an artist, a surprising finding emerges (see figure 14): Although the number of artworks sold increases quite dramatically around the time of an artist's death, this leaves the prices virtually unaffected until four or five years after death. Even more surprising is the difference between "ordinary painters" (left panel in figure 14) and "superstars" (right panel of figure 14). In both groups, auction prices peak in the fourth year after an artist's death and decline thereafter. In the first two years after an artist's death no particular price reaction occurs.

Figure 14 Development of Auction Prices for Different Groups of Artists[27]



(own diagram)

In order to control for the influence of other (potential) determinants of auction prices we include in our estimations a number of variables that have been found to be statistically significant in other studies (table 8 above). Table 10 displays the means and standard deviations of our dependent variable (PRICE) as well as the independent variables. Of particular relevance in our context is the "superstar dummy" denoting artists whose works have been shown in the 2004 exhibition of the Museum of Modern Art in Berlin and the number of transactions per year which is considered a measure of market activity.

[27] Ten years before and ten years after death (0=year of death); left: "average painters", right: "star painters"

Table 10 Means and Standard Deviations of Variables

		Mean	Std. Dev.	Min.	Max.
PRICE	Price at auction (corrected by CPI 2000)	98,840	754,028	287	9,880,000
MD_OIL	Medium: Oil on Canvas (0=no; 1=yes)	0.45	-	0	1
MD_WAC	Medium: Watercolor (0=no; 1=yes)	0.46	-	0	1
MD_PRINT	Medium: Print (0=no: 1=yes)	0.09	-	0	1
SIG	Dummy variable for artwork signed by artist (no=0; 1=yes)	0.71	-	0	1
MOMA	Dummy variable for participation in the 2004 MoMA exhibition in Berlin (0=no; 1=yes)	0.26	-	0	1
SIZE	Size of artwork (in m squared)	3,827	7,975	9	340,312
TPY	Number of transactions per year	5,908	4,040	341	12,430

(own data)

The models we estimate are of the following general forms:

$$\ln(AP) = \alpha_0 + \alpha_1 TW + \alpha_2 TW * MOMA + \alpha_3 SIZE + \alpha_4 SIZE^2 + \alpha_5 \Sigma MD + \alpha_6 SIG + \alpha_7 TPY + \alpha_8 \Sigma AH + \alpha_9 YD + \varepsilon$$

where

- ln(AP): log of auction price (in 2000 US$)
- TW: time window around artist‘s death (various measures; see below)
- MOMA: artist’s works displayed at the “MoMA” exhibition in Berlin in 2004
- SIZE: size of artwork in m (plus squared term)
- MD: vector of medium dummies (oil (ref. cat.); watercolor; print)
- SIG: signed by artist (dummy; 0=no; 1=yes)
- TPY: number of artworks auctioned in respective year
- AH: auction house dummies (n=13)
- YD: vector of year dummies

Moreover, we also include dummies denoting the most prestigious auction houses as we assume that their reputation will result in significantly higher prices. Apparently, the market shares of the two most prominent auction houses (Christie's and Sotheby's) are quite considerable (more than 56% of all transactions in our sample occurred in these two places).

Table 11 Market Shares of Different Auction Houses in Sample[28]

Auction House	Abbreviation	Market Share (in %)
Sotheby's	ah_sotheb	31,8
Christie's	ah_christ	24,4
Finarte	ah_finart	2,3
Guy Loudmer	ah_guylou	1,7
Ader, Picard & Tajan	ah_aderpi	1,6
Hauswedell & Nolte	ah_hauswe	1,5
Blache	ah_blache	1,5
Phillips	ah_philli	1,3
Lempertz	ah_lemper	1,3
Ketterer	ah_ketter	1,3
Francis Briest	ah_franci	1,3
Kornfield	ah_kornfi	1,3
Villa Griesebach	ah_villag	1,1

(own data)

To the best of our knowledge the following analysis is the first to distinguish between

- the effect of an anticipated and an unanticipated (sudden) death (we use different time windows around the death an artist) and
- two different types of artists (we separate "average artists" from "superstars").

We estimate four different models (see table 12) that differ only with respect to the particular time window (TW) around the artist's death. Models (1) and (2) are based on the assumption that the market may anticipate an artist's death (i.e. because of age, reported poor health, drug addiction, etc.). Models (3) and (4) assume that the artist's

[28] The total number of auction houses in our sample is 353. Thus, the degree of con-centration is quite high.

death was not anticipated. Moreover, time windows around the artist's death have been constructed as follows:

- Model (1): 2 years before and 2 years after death
- Model (2): 4 years before and 4 years after death
- Model (3): 2 years after death
- Model (4): 4 years after death

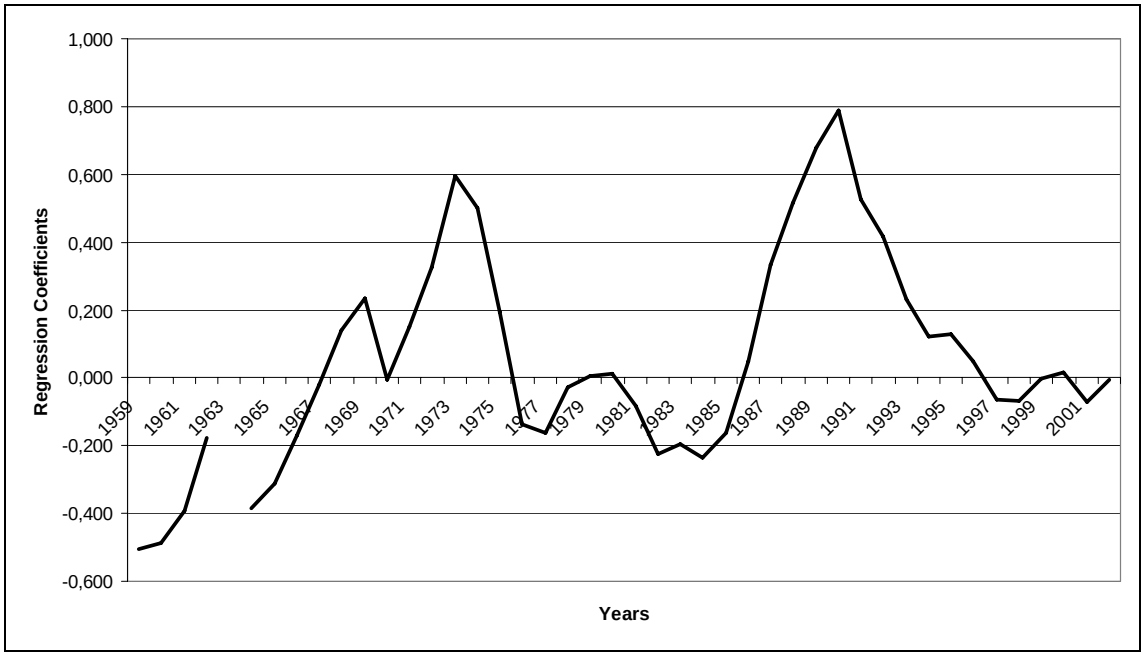
Table 12 Regression Results for Models (1) to (4)

	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
tw2	0.034 (3.42)**	-	-	-
tw2 * moma	0.045 (3.17)**	-	-	-
tw4	-	-0.012 (2.39)*	-	-
tw4 * moma	-	0.067 (9.12)**	-	-
tw_r2	-	-	0.047 (4.41)**	-
tw_r2 * moma	-	-	0.029 (1.86)+	-
tw_r4	-	-	-	0.020 (3.65)**
tw_r4 * moma	-	-	-	0.034 (4.27)**
md_wac	-1.357 (245.38)**	-1.357 (245.40)**	-1.357 (245.38)**	-1.357 (245.43)**
md_print	-2.531 (245.28)**	-2.527 (244.62)**	-2.532 (245.48)**	-2.530 (245.06)**
sig	0.448 (81.71)**	0.448 (81.67)**	0.448 (81.73)**	0.448 (81.70)**
size	0.746 (157.73)**	0.746 (157.77)**	0.746 (157.75)**	0.746 (157.78)**
size_2	-0.038 (88.57)**	-0.038 (88.60)**	-0.038 (88.58)**	-0.038 (88.61)**
ah_sotheb	0.737 (125.09)**	0.737 (125.07)**	0.737 (125.11)**	0.737 (125.11)**
ah_christ	0.681 (110.28)**	0.681 (110.29)**	0.681 (110.28)**	0.681 (110.29)**
ah_finart	0.233 (14.51)**	0.232 (14.47)**	0.234 (14.57)**	0.234 (14.56)**
ah_guylou	0.272 (16.29)**	0.272 (16.28)**	0.272 (16.29)**	0.272 (16.27)**
ah_kornfi	0.544 (28.54)**	0.545 (28.58)**	0.544 (28.52)**	0.545 (28.55)**
ah_aderpi	0.304 (17.80)**	0.304 (17.84)**	0.304 (17.81)**	0.304 (17.82)**

ah_philli	0.315 (17.17)**	0.315 (17.15)**	0.316 (17.18)**	0.316 (17.19)**
ah_lemper	0.164 (8.57)**	0.164 (8.61)**	0.164 (8.57)**	0.164 (8.58)**
ah_hauswe	0.202 (11.01)**	0.202 (11.04)**	0.202 (11.01)**	0.202 (11.01)**
ah_blache	0.128 (7.09)**	0.128 (7.08)**	0.128 (7.10)**	0.128 (7.12)**
ah_ketter	0.111 (5.86)**	0.113 (5.92)**	0.112 (5.86)**	0.111 (5.85)**
ah_franci	0.182 (9.61)**	0.182 (9.58)**	0.183 (9.64)**	0.183 (9.67)**
ah_villag	0.394 (19.03)**	0.393 (18.99)**	0.394 (19.04)**	0.394 (19.03)**
tpy * 10^{-3}	0.062 (12.89)**	0.062 (12.89)**	0.062 (12.89)**	0.062 (12.92)**
Year dummies	Included[29]			
Constant	8.747 (147.49)**	8.747 (147.52)**	8.746 (147.49)**	8.745 (147.47)**
Number of Observations	265881	265881	265881	265881
Number of Artists	560	560	560	560
R2	0.46	0.46	0.46	0.46
Absolute value of t statistics in parentheses				
+ significant at 10%; * significant at 5%; ** significant at 1%				

(own data)

Figure 15 Price Index 1959 to 2002 (2003 as reference)



(own diagram)

Our estimations show that in every single case the fixed effects specification is to be preferred (the Breusch Pagan- as well as the Hausman-Test always resulted in statis-

[29] Coefficients not reported here, but plotted in Figure 15. Please contact author for detailed information.

tically significant values). Moreover, the signs of the control variables are as expected and their coefficients are without any exception statistically significant: Oil pictures are - all else equal - significantly more expensive than pictures drawn in watercolor or prints. Size has a positive, but declining impact on auction prices (the squared term is significantly negative). The "optimal" size in terms of auction prices is approximately 9.186 square m (only few of the pictures in our sample exceed that size threshold).

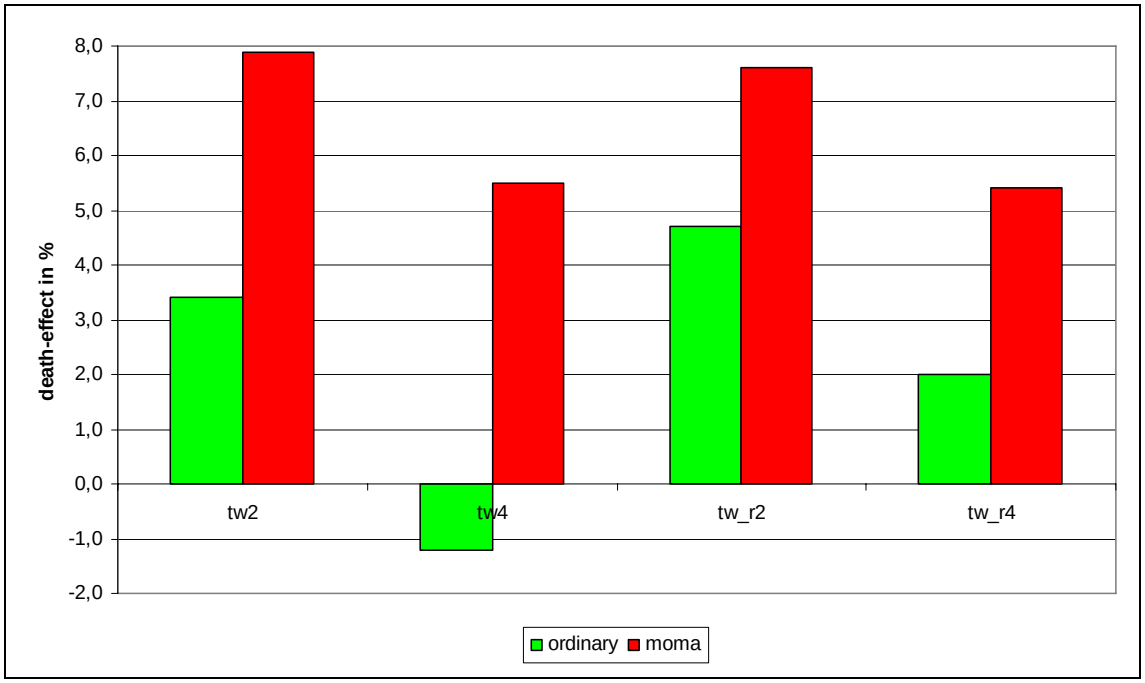
Our estimates reveal a number of interesting findings, most of which are in stark contrast to the available literature:

First, in almost every specification, the coefficient of the "death-variable" has the expected sign and is highly significant. The only exception occurs in the case of "ordinary artist" when we consider a rather long period of time around the death of the artist. Here, the coefficient is negative.

Second, anticipation effects play a minor role only: Comparing the coefficients of the estimates that not only take into account the years immediately following a person's death with the coefficients we receive when also controlling for the years preceding death, we end up with virtually identical coefficients.

Third, and certainly most important in our context, is the finding that there are pronounced differences in the reactions of the market when we compare "ordinary" artists and "stars": The death effect is two to three times as large in the case of the latter (in order to facilitate comparisons across the different estimations, the coefficients of the time window variables are summarized in figure 16).

Figure 16 Coefficients of Various Measures of Time Window around Artists' Death



(own diagram)

Moreover, as expected are the coefficients of the auction house dummies: Artworks that have been sold at either Christie's or Sotheby's are about 70% more expensive than those at sale at less prominent auction houses (the reference category that is composed of more than 300 auction houses with small market shares only). However, a number of other auction houses manage to realize high prices too, among them Kornfield and Villa Griesebach, but also Guy Loudmer, Phillips, Finarte and Ader, Picard & Tajan.

(5) Summary and Implications for Further Research

Our estimates show that prices tend to rise quickly following an artist's death and then fall back over time. This is clearly inconsistent with the durable goods monopolist effect. We suspect that media attention that surrounds the death of a prominent artist increases the public interest in the person and that person's works.

If, however, this public interest is short-lived, the increase in prices will result in a "nostalgia effect": Prices increase immediately after the death of a celebrity and then fall back as time goes by. Thus, we expect two different developments (which we will explore in the near future): Since media coverage of "celebrities" has increased over

time, we expect the "nostalgia effect" to be more pronounced in the 1980s and 1990s compared to the 1960s and 1970s. Moreover, we expect that effect to be more pronounced for "average artists" who usually disappear much faster from people's minds than "superstars".

Moreover, the measure for "superstardom" we use in our estimations (a dummy for presence at the Berlin exhibition of the Museum of Modern Art in 2004) is certainly a very crude one. Replicating the estimations with refined measures of superstardom is certainly advisable.

Apart from these minor shortcomings our results offer convincing evidence in favour of the "nostalgia effect": Auction prices do indeed rise following the death of an artist, but tend to revert to their pre-death level very soon. Moreover, these effects are limited to the more famous artists while for the average painters this effect cannot be demonstrated to the same extent.

4.3. Middle-Men, Experts and the Media: Artists as Superstars

The last analysis of this thesis analyzes the influence of the softer factors surrounding the art market, namely expert appraisals and the artist-specific consumption capital stock, on the income of artists in respect to superstardom. As stated in chapter 2.2, these factors are of increasing relevance for the art market.

(1) Introduction

In recent years the art market and its actors have played the game of superstardom in a way that was formerly only found in popular music and film: fans queuing up early in the morning for admission to the MoMA exhibition in Berlin over a period of months in 2004, the crowded re-opening of the MoMA in New York and of the temporary exhibition of the Guggenheim in Bonn in 2006 - such phenomena are more readily associated with pop concerts than art exhibitions. The "high-class" fans (called collectors or connoisseurs) travel the world to attend the most important art shows, such as

the biggest art party "Art Basel Miami Beach", as well as private exhibitions and gallery openings with closed guest lists and champagne all night long.

The press focuses on the big art events and their attendees in order to present it to the (excluded) public. Reports on new record auction prices even reach public newspapers and everybody can swap small-talk about at least one famous new trend (e.g. "the Leipziger Schule" or Chinese art), or about artists and their private lives. Galleries, dealers and auction houses do their best to accelerate the market and sell more and more of the big stars for higher sums than ever before.

Furthermore, artists act increasingly like Hollywood stars, either living out their obsessions in public ("sex, drugs and rock n' roll" as it used to be called) and having large amounts of money to spend on private consumption or unprecedented projects, or withdrawing into a private sphere and being presented in the media as a reclusive genius. Artists are decoding and using the art world and its hidden mechanisms for their private wealth and professional advancement.

In addition to this anecdotal evidence, a more specific definition of superstardom has been provided in the economic literature, especially in the area of cultural economics. The relevant theory was developed by Rosen (1981) in the early 1980s, was extended by Adler (1985) and MacDonald (1988), and continues to be used for analysis in many areas today, but it has hitherto not been used for the visual arts in any depth. This is quite surprising, as many of the theories developed in other areas of cultural economics have been adopted for the visual arts in recent years.

Because of this lack of theoretical analysis and the mystical aura surrounding superstardom in the visual arts it is the goal of this analysis (1) to find out if the theories of superstardom are valid for the sphere of the visual arts and (2) to test why superstars, in an economic sense, exist in the visual arts. To analyse the first question, recent literature on superstardom will be used and adapted with reference to the visual arts in chapter 2. Chapter 3 describes the data needed for the analyses conducted in chapter 4,

the aim of which is to show for what reasons superstardom exists or not. Chapter 5 presents a conclusion drawn on the basis of the facts and insights presented.

(2) Superstardom in Cultural Economics and the Visual Arts

The theoretical foundations of the superstar theory were established in the literature of cultural economics between 1981 and 1988 by three authors: Rosen (1981), Adler (1985) and MacDonald (1988). On the basis of these texts and the various applications and extensions of this theory[30], it is possible to (a) define the phenomenon of superstars and (b) describe the reasons for the development and existence of superstardom in markets for visual arts. The facts presented will be tested for their applicability to the market for visual arts.

Table 13 Overview of Literature Published so Far

Author(s) and Year of Publication	**Data**	**Major Findings (partly taken from the author(s))**
Rosen (1981)	Theoretical considerations.	Small differences in talent result in large differences in income if imperfect substitutability and technology for joint consumption are fulfilled.
Adler (1985)	Theoretical considerations.	A learning process on the customer side is responsible for the superstar phenomenon. Music consumption of a particular artist increases "consumption capital" and while discussing with others about this music the capital is accumulated. This interaction creates positive network externalities which snowballs an artist into a star. No differences in talent have to exist for this explanation.
MacDonald (1988)	Theoretical considerations.	With a dynamic model of Rosen's superstar model it is shown that the observed quality of an artist's performance influences his or her future success. Bad first-period performers leave the business and the remaining performers can charge higher prices and possibly become superstars.
Frey & Pommerehne (1989b)	Theoretical considerations together with some income distributions of special years and professions.	Chapter 9 deals with the income of artists. Beside general considerations of income and its determinants, unemployment and risks facing artists, anecdotal evidence is also given for the existence of superstar effects in several artistic professions. The topic closes with the application of Adler's and Rosen's theories in the context of the risks involved in taking up this profession.
Hamlen (1991)	Billboard top 1000 singles (1955 to 1987), billboard top 40 hits and billboard book of Gold & Platinum Records together with several data representing the voice quality.	Testing "voice quality" as a measurement of talent in the Marshall-Rosen sense compared to income. The popular music industry seems not to be an example of the superstar phenomenon.

[30] See table 13 for an overview of the literature published so far.

Chung & Cox (1994)	Number of Gold-Record Awards by the RIAA between 1958 and 1989 with 1377 performers.	A statistical model developed by Yule and Simon is deployed as a probability mechanism for predicting the buyer behaviour of consumers. It is shown that different talents are not needed for the superstar phenomenon to arise.
Hamlen (1994)	See Hamlen (1991).	Analyzes the 1955-1987 market for the recorded popular music within the context of the multi-level market superstar process described by Glenn MacDonald. A discussion on the music industry of the United States can be found with a clear focus on the "superstar phenomenon" and the factors contributing to superstardom.
Frank & Cook (1996)	Theoretical considerations.	Emphasizes the role of the "winner-takes-all" markets in supporting inequality and making the United States market less productive. There is a dependence on relative performance. To restore this, a progressive tax structure is needed in order to restore equality of incomes and boost economic growth.
Hausman & Leonard (1997)	Seasonal data on local, regional and national over-the-air rates between 1989/1990 and 1992/1993 from A.C. Nielsen.	Television ratings are higher when special players are involved in the game. Superstars create external effects on the opposing teams and even on the whole league. These superstar externalities can lead to inefficient player talent distribution and free ride effects. Salary caps are discussed as a way of solving these problems.
Chung & Cox (1998)	Cast listings of over 12000 major movie releases with 13155 movie stars.	This study uses the statistical model of Yule and Simon for predicting the number of appearances of movie stars in films. It is shown that individuals minimize search costs by choosing the films with the most popular movie stars.
Cox & Falls (1998)	unknown	Examines the superstar phenomenon as an implication for the probability mechanism by which golf tournaments are won. Determination of whether the Yule distribution can explain the relative frequency of golf tournament victories by successful golfers; existence of a marked skewness in the distribution of output and earnings among individuals in various socio-economic fields.
Frey (1998)	Theoretical considerations.	For the case of "world famous museums of art" superstardom is analysed. A demand and supply side explanation is offered for the evolution and existence of superstar museums.
Dobson & Goddard (2001)	English football club-level data with extensive international comparisons.	This book presents an original economic analysis of the English professional football industry. The economic influences on decisions taken by owners, managers, players and spectators are all considered, using theoretical and empirical methods of economic investigation. Special research on contractual arrangements in the players' labour market touches on superstardom theory.
Frick (2001)	998 NBA player incomes and performance between 1990 and 2000. 819 NHL player incomes and performance between 1997 and 2000.	The pay difference between superstars and "water boys" in the sports is more distinctive than for normal jobs and results from individual player performance and audience preferences. This can be explained by technological possibilities and the existence of scale effects.
Nelson et al. (2001)	Weekly box-office data for nominated and non-nominated films.	This article examines the impact of an Academy Award nomination and award for best picture, best actor/actress, and best supporting actor/actress on a film's (i) market share of theatres, (ii) average revenue per screen, and (iii) its probability of survival. The results indicate substantial financial benefits for a nomination and award for best picture and best actor/actress. The structure of rewards is consistent with that found in two-stage, single-elimination tournaments.

Khurana (2002)	Theoretical considerations.	This article evaluates the effect of charismatic chief executive officers (superstars) in their companies. The author's new research reveals that the widespread belief in the powers of charismatic CEOs can be problematic.
Leone & Wu (2002)	I/B/E/S and First Call data of institutional investor rankings for financial analysts.	Evaluates the logic behind rankings and how they influence the behaviour of economic agents in the case of financial analysts. The presented results suggest that the market for analysts is a market with superstars. On average, highly talented analysts are identified (ranked) early in their careers and remain in the profession while less talented analysts leave.
Lucifora & Simmons (2003)	Rare data of individual earnings and other personal characteristics of a set of soccer players in the 1995-1996 Italian league season.	Given the popularity of "top" soccer players, the relationship between individual productivity and pay can lead to "superstar" effects. In that context, the marginal revenue product of a soccer player is related to the extra price that a spectator is willing to pay to see him play (live or on television) times the number of spectators who are attracted. Earnings are found to be highly convex in two performance measures after controlling for a set of personal characteristics and team fixed effects.
Berri & Jewell (2004)	unknown	The purpose of this article is to extend the work of Hausman and Leonard via an examination of road attendance in this sport. The evidence we report suggests that a superstar externality also exists on the road in the National Basketball Association. Policy suggestions to remedy this issue are offered in the text.
Deuchert et al. (2005)	Oscar nominations, weekly returns and movie survival times.	This paper investigates the effect of Oscar nominations and awards on movies' financial success by estimating the impact on weekly returns and on movies' survival time. The findings suggest that nominations for Oscars generate substantial extra revenues, while winning an award contributes only little to this extra rent.
Krueger (2005)	232911 concert reports for 1275 artists between 1981 and 2003 out of the Pollstar Boxoffice Report database. Artist information from The Rolling Stone Encyclopaedia of Rock & Roll.	Explanation of the ticket price rise and the decrease in the number of sold tickets. Superstar theory explains the long-term price trend in the industry but not the recent surge in prices and revenues.
Lehmann & Schulze (2005)	Wage and individual data of German first-division soccer players between 1998/1999 and 1999/2000 out of Sportbild and Kicker.	Individual performance and media presence explain a large part of German soccer players' pay but evidence is not found for the theories of Adler and Rosen because small differences in performance and media presence do not result in disproportionately large differences in earnings.
Malmendier & Tate (2005)	Hand-collected list of the CEO award winners between 1975 and 2002 from several American sources. Additional data contains demographic and compensation data of CEOs as well as data of firm performance.	The impact of winning high-profile tournaments on the subsequent behaviour of the tournament winner in the context of chief executive officers of U.S. corporations is analyzed. It is found that the firms of CEOs who achieve "superstar" status subsequently underperform beyond mere mean reversion. At the same time, award-winning CEOs extract significantly more compensation from their company following the award. The results suggest that media-induced superstar culture leads to behavioural distortions beyond mere mean reversion.

Berri & Schmidt (2006)	1996/97 until 2001/02 data from the NBA containing information about salaries.	The purpose of this inquiry is to examine how wage inequality impacts the productivity of the firm. The literature suggests that wage inequality may promote firm productivity. In contrast, other writers have argued that wage disparity lowers firm output. During the 1990s, the National Basketball Association experienced dramatic increases in the level of wage inequality. The empirical evidence reported here supports a third possibility. Specifically, wage inequality and firm productivity are not related.
Franck & Nüesch (2007)	Number of articles in quality and tabloid newspapers, press agencies, weekly and music magazines mentioning American Idol finalists of season 1 to 3	Media companies generally enjoy increasing profits if more customers watch a program. The viewer drawing capability of stars serves as a prominent instrument to increase the audience. The literature distinguishes between two different types of stars: highly talented and therefore 'self-made' superstars, and famous but 'manufactured' and thus rather trivial celebrities. Whereas 'self-made' superstars attract viewers by providing services of superior quality, 'manufactured' celebrities draw attention by fabricated fame. Illustrating the Pop Idol series and comparing the abilities of superstars and celebrities to generate and to capture value, we show why 'manufacturing' celebrities is a lucrative business for the media.
Garcia-del-Barrio & Pujol (2007)	Spanish professional soccer league for the season 2001/2002.	In labour markets where few companies compete for many workers, economic theory predicts monopsony rents. Surprisingly, soccer clubs do not profit from the expected rents. The purpose of this study is to explain such contradictory evidence. The model and empirical test suggests that monopsony rents that the clubs were to obtain from most of the soccer players would eventually revert to the superstars. The study also illustrates that the market value of players stems both from their sporting performance and their economic contribution.
Matthews, Sommers & Peschiera (2007)	Round-by-round results from the 2000 LPGA tour with rank and price money for each player finishing at least four rounds of the game.	This study explores the role of incentives on the 2000 LPGA Tour. Overall, it finds them to have limited effectiveness. Several possible explanations are considered, including unmeasured differences in both abilities and courses and variations in the distribution of prizes across tournaments. The existence of a "superstar effect" is also considered.

(own data)

(a) Definition of the phenomenon

First, the phenomenon of being a superstar has to be described. Therefore Rosen defines the phenomenon of a star "wherein relatively small numbers of people earn enormous amounts of money and dominate the activities in which they engage" (Rosen, 1981). This sentence includes three important points that can be used to formulate a proper definition:

(1) The most obvious factor for recognising a superstar is his **high income** compared to others in his artistic guild. Conversely, young artists, entrants to the market

and non-superstars "earn incomes well below what their current alternative offers" (MacDonald, 1988).

A view of the income of artists has been given by Filer (1986) and Frey & Pommerehne (1989b) who provide a mixture of anecdotal and statistical evidence. According to Frey & Pommerehne "some of the artists generating high quality achieve exorbitant incomes" (Frey and Pommerehne, 1989b), but many unknown artists suffer poverty and sell works for prices close to the cost of production. The latter normally serve the primary market, whereas superstars normally sell in the tertiary market, which is international and dominated by auction houses, major galleries and art dealers.[31] The income earned by superstars from record sales is assumed to be significantly higher than for their impecunious colleagues - despite the fact that an unknown portion of the money does not go directly to the artist, because the auction houses, galleries and dealers act as agents and charge high commission fees for the arranged transactions.[32] According to Filer, the image of the "struggling" artist cannot be confirmed, since many artists earn quite a lot better than they would if they worked in alternative positions open to them in other sectors of the economy. On the basis of data from the 1980 census, Filer shows that artists do not earn less, and are younger, than similar personnel in equivalent positions. Artists also have a lower rate of switching professions. When considering artists over 40 years of age, Filer also finds that artists commonly earn more than the general workforce. He considers this to be explained by the high dropout rate in the early years. Those who survive the competition in their younger years will have a long working life with a high income. Whether this "high income" is a hint towards superstardom remains unsolved, but it is to be assumed that Filer looked at the average artist and not the high end of the market in his analysis.

(2) When viewing the whole market, superstars should - according to the theory - **dominate** the area in which they work. According to Adler (1985) "output is concen-

[31] For a closer description of the art market hierarchy see THROSBY, D. (1994) The Production and Consumption of the Arts: A View of Cultural Economics. *Journal of Economic Literature,* 32**,** 1-29.
[32] With the implementation of "Droit de Suite" in the EU, artists should obtain a greater share out of future sales of their art.

trated on those few who have the most talent". In an economic sense, "domination" can be translated into many different attributes and "output" is not necessarily only to be understood in terms of physical goods. Therefore such "domination" may indicate a large number of transactions in comparison with others, the realisation of higher prices than others, attendance at the most important events of the sector or frequent media appearances, and so on.

When applied to the visual arts, these points can be adopted in their original meaning. Domination can signify a large number of sales and selling-rates[33] for superstar artists. This phenomenon can be seen at art auctions, galleries and art fairs all over the world right now, with certain high-end artists selling their works almost before they have finished drying. The high prices which are reached correspond to the disparity between supply and demand in this case. In accordance with the definition, these artists also are present at the main exhibitions and in the mainstream media. Since attention for its own sake appears to constitute a kind of "output" for artists (and seems to be important for the explanation of superstardom that follows below), we are venturing into an area that is difficult to quantify, as Franck (1998), for example, describes in his "economies of attention". But not only the artistic good (e.g. the picture) is part of the product to be sold; nowadays this good is a means of entry into the "art set", leading to invitations for gallery openings, exhibition parties and so on. This "added value" is mostly added by galleries or other middle-men selling art. Therefore domination can also be seen in this light: dominating the attitudes of art buyers and acting as a gatekeeper to the exclusive art world.

(3) By definition, the superstar effect **applies to a small number** of market actors. As "success is rare" (MacDonald, 1988) the majority of market actors are not affected by superstardom.

[33] At auction this is the ratio of actual sells to buy-ins, which is what it is called when auction houses "buy" the auctioned good at the seller's reserve price in order to prevent it from appearing as unsold.

It is an obvious fact that the number of affected artists in the visual arts is small, and that is closely associated with their high income and market domination which, per se, excludes the possibility of artists throughout the whole market being affected.

In short, superstars are rare and conspicuous members of their artistic guild, who sell many items at a very high price and enjoy a dominant presence in the art world in general. In contrast, the rest of the market conforms more or less to the image of the "struggling artist" (not necessarily in terms of income but relative to their superstar colleagues), most of whom work at a regional level without relevance for the broader market.

As one can see, the definition of superstardom seems to be appropriate for the visual arts market and therefore we can find no theoretical drawbacks that might affect our further analysis.

(b) Reasons for the development and existence of superstardom

Next, several reasons will be presented regarding the question as to why superstardom develops in markets for artistic goods. Many of the reasons are quite obvious when one has read the definition above, but some need more detailed discussion when being adapted to the market for the visual arts.

(1) Rosen (1981) defined the most important assumption for the existence of superstardom as **imperfect substitutability** of the artistic goods of superstars. People are unwilling to substitute lower degrees of talent at a lower price for higher degrees of talent - "lesser talent is a poor substitute for greater talent" (Adler, 1985). Frey (1998) gives a demand-side explanation for this: firstly, the cost of comparing artists and their work has decreased as a result of the lower cost of travel and owing to the modern media. This means that everybody can afford to compare, therefore find and lastly see the best performance. Secondly, there are cognitive limitations to the ability to remember every artist, so that each individual short-lists a certain number of artists in their mind, and these personal shortlists are largely made up of the same superstars. Finally, con-

sumption today is socially shared (interlink to Adler's theory) and concentration on a few superstars is quite normal because of positive network externalities.

In the visual arts this can be proved, as people "choose not to spend time looking at lesser known Cubists when they can enjoy Picasso's paintings". (Frey, 1998) On this basis the most important explanation for superstardom is **differences in talent**. Due to these differences and imperfect substitutability, the crowd is willing to pay much more for an artistic performance of marginally higher quality than for a performance perceived as "second-rate". But this explanation is also problematic as the recognition of talent by the unpractised public is questionable, especially in the visual arts. Very often artist names or famous art-schools are used as signals for quality, as the real talent of an artist behind this "labels" is not observable for the public. As these "labels" themselves are results of other mechanisms described later, it is assumed that talent in the visual arts is of lesser importance for the generation of superstardom.

(2) Next, Rosen was the first to explain a second reason for the existence of superstars: namely, the development of **technical improvements for endless reproduction at a fixed cost** over the past centuries and, in particular, recent decades. Following this argumentation, the development of printing, newspapers, radio, TV, audio tapes, CDs and lately the internet, has been very much conducive to the emergence of superstars. These media have made it possible for them to perform in front of a bigger and more international audience than in earlier periods, when modern transport facilities did not exist, without incurring significantly higher production costs. This has had positive effects on the income of artists and lastly leads to superstardom.

For the visual arts this argument is more complex. Since a copy of a work of art is not the same as the original (de Marchi et al., 1996, Benjamin, 1963), the role of the modern media seems questionable. Although journals, posters, art books, internet pages with virtual exhibitions and so on can probably represent endless reproduction of the original to a certain extent, there is more to it than that. But the point being made is that it is not necessary to transport the "content" of the works of art but rather to transport

the "information" about events, exhibitions, prices and superstars in general. Hollein (1999) has given a good explanation, noting that the art and art-communication system has extended enormously over the past decades. This reduces individual search costs, as people can use their own TV, radio, magazines and the internet to stay informed. Frey (1998) says that "modern media produce significant economies of scale" which reinforces this argument.

(3) Next, Adler (1985) added a quite convincing explanation regarding situations in which observable talent differences are not needed for the development of superstars. The process of **accumulation of consumption capital** (knowledge) seems to play a major role in the creation of superstars. Discussing works of art with others builds up more specific consumption capital. When well-known superstars are concentrated on, the search costs required in order to find discussion partners are reduced. This results in positive network externalities.

Here the role of the media is more important than in the point presented above. The media take an active role in knowledge accumulation, with the more important publications, such as "art" in Germany, "Art in America" in the USA and "Parkett" in Switzerland, influencing the attitudes of the interested public, setting the "labels" needed for evaluation and therefore actively contributing to the process of building up consumption capital. As the number of these publications and general possibilities of staying informed have increased in recent years (Hollein, 1999), this could be an explanation for the rise of superstardom. Together with the new possibilities presented by the internet, this point seems to be of increasing importance. Internet portals like Artfacts.Net, artnet.com, Artprice.com, art-in.de, Artist-Info.com and Kunstmarkt.com provide both general and artist-specific news to a wide range of internet users and disseminate information about the market, new trends and so on more rapidly than ever before.

(4) Finally, MacDonald (1988) has added an important point: namely, that the role of **experts and their appraisals** has an effect on superstardom. As first-time reviews

have predictive power for second-period performances, the development of superstars is encouraged by ongoing positive appraisals by experts.

Precisely this definition was given by Bonus & Ronte (1997) who said concerning artists that "the process by which credibility is created is path dependent". With their definition of cultural quality as a specific type of cultural knowledge built up by experts from the art scene, they describe exactly the power and influencing role of the middle-men in the art market.[34] Beckert & Rössel (2004) have pointed out that quality is the reason for a particular price and this quality is formed by appraisals of viewers and institutions; reputation and appraisal by experts and institutions constantly boosts prices in the art market. The information about visual arts and artists presented in the media is normally presented by experts and therefore strongly affects consumers, their attitudes and mind-setting. In addition, artist rankings such as those of Capital Kunstkompass[35], AI-Index[36] and Artfacts Artist Ranking[37] are regularly published which aggregate the opinions of experts and present the results to the interested public. Due to these expert appraisals the need for the (mostly impossible) individual assessment of an artist's talent is reduced.

Taking these points together, it would seem that the nature of artistic goods as "experience goods" is largely responsible for the creation of superstars. As is evident from the facts presented so far, the existence of superstardom in the visual arts is, by definition, dependent on expert appraisals and differences in artist-specific consumption capital more than on differences in talent. Furthermore, the given reasons seem to fit the art market even when it can be seen that the middle-men seem more responsible for producing the effects needed to build up superstars more than the artists themselves.

[34] Special attention to the role of "middle-men" and "market makers" without connection to the art market was given by Rust & Hall RUST, J. & HALL, G. (2003) Middlemen versus Market Makers: A Theory of Competitive Exchange. *Journal of Political Economy,* 111**,** 353-403. They refer to middle-men as dealers and brokers owning private market information about prices, and market makers as specialists posting ask and bid prices. In analogy to this, middle-men in the art market are art dealers and galleries, market makers are auction houses.
[35] See below for further information.
[36] Started in 2006 by Manfred Schumacher and published first in ARTInvestor No. 05/2006 pp. 70.
[37] Was developed in 2003 and covers a time-span from 1998 to the present. See http://www.artfacts.net/index.php/pageType/ranking/paragraph/1 for further information.

Application of the concept of superstardom to the field of the visual arts is quite rare. Two exceptions are Frey & Pommerehne (1989b) and Frey (1998), whose work is at least indirectly linked to the present topic. Frey & Pommerehne dealt with this matter in anecdotal form. In chapter 9 of their book they presented some evidence for the existence of superstardom in history and in our times. Frey took up this theme and applied it to museums. There has evidently not been any application of the superstar theory to the visual arts and especially to artists.

To summarise the theories of superstardom presented above, one can see that two main explanations exist to account for this phenomenon in the visual arts: expert appraisals, on the one hand, and the artist-specific consumption capital stock, on the other. In the following chapters, these two explanations will be tested by applying the following hypotheses:

(1) The higher the artist-specific consumption capital stock of the public, the higher the chance of becoming and/or remaining a superstar. The ability to build up artist-specific consumption capital is strongly dependent on the amount of media attention focused on the artist and the response of the public to this attention. The greater the media attention or public response, the greater the possible consumption capital associated with the artist. This lastly should lead to higher chances of becoming and/or remaining a superstar.

(2) Better expert appraisals lead to superstardom. Experts and their appraisals are indicators for quality and reputation of artists. These indicators are used by the public to get information about quality of an artist, which is hard to observe for inexperienced viewers and non-experts. First-time reviews therefore have predictive power for second-period performances and lead consequently to superstardom.

(3) Dataset and Methodology

For the analysis, three types of data are needed in order to indicate if an artist qualifies for superstar status: (1) data about the artist-specific consumption capital, (2) data about expert appraisals and (3) data about the income an artist achieves.

Before starting with the data itself, a list of artists had to be assembled. Therefore artist names from Artcyclopedia (Artcyclopedia: The Fine Art Search Engine, 2005) were taken as a basis. Artists from the sources described below were added if they were not on the original list. A unique identifier (ID) was introduced to ensure comparability and connectivity between the various datasets. In total, 1806 artists born between 1280 and 1979 were included in the sample, covering the artistic periods from Byzantine art (pre-Renaissance) to contemporary art. Of course, the spelling of the artist's names, their dates of birth and death, as well as their nationalities were harmonised before starting further research.

To obtain information about the **artist-specific consumption capital** devoted to an artist, the total number of hits by the internet search engine Google was used.[38] The information on the number of Google hits per search word is used to gauge the popularity of each artist as media attention and the public response to this. According to Garcia-del-Barrio & Pujol (2007), who used Google to calculate the revenue-generating capability (in contrast to the sporting capability) of Spanish football players, this seems to be quite a good measure to use.

Every hit on Google represents a webpage dealing with the artist or with his or her life or works. Hits may be biographical pages, information about exhibitions, information about the latest sales, excerpts from printed articles and so on. It may be assumed that nearly all printed information is "echoed" on the internet, so that an article in a famous newspaper, for example, is printed in a short version on the internet, is commented on in blogs or on other websites etc. Interestingly, this mechanism provides for the automatic weighting of the original information: more important on- and offline publications about an artist get more response on the internet (with links, citations, blog comments or other articles referring to the original). These responses are also listed by Google and therefore increase the number of total hits. The original information (one

[38] The values were computed with the average number of total hits in February 2006. The corresponding search term was constructed in the manner "'name of artist' AND 'artist'" in order only to find information about the popularity of the artist in the English-speaking area. For the German-speaking area the terms used in the search were "'name of artist' AND 'künstler'".

hit on Google) produces several more hits with referred information and therefore increases its own relevance and the popularity of the artist in general, respectively his artist-specific consumption capital.

Table 14 Structure for Google Data

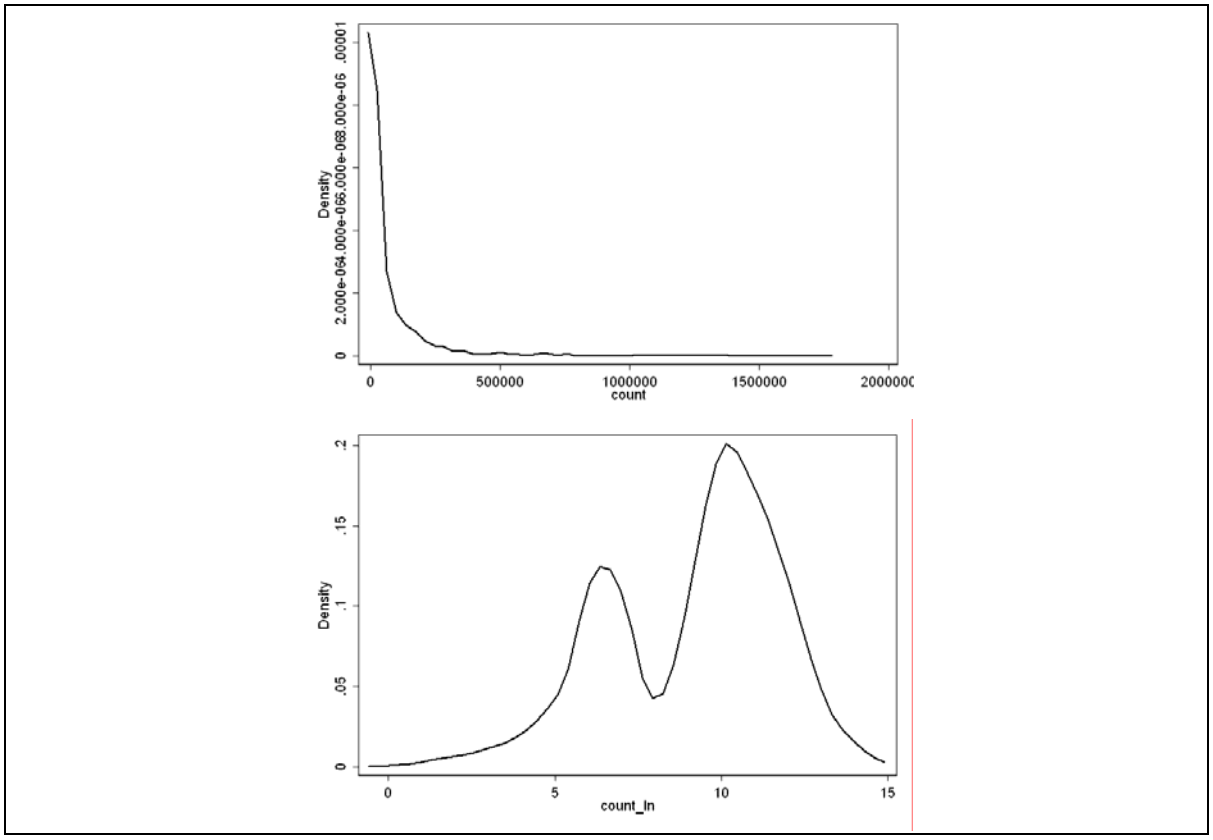
Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.				
COUNT_EN * 10-5	Count of total hits for artist on Google together with the search term "artist" in 100000s.	0.6962263	1.659189	0	17.72000
COUNT_DE * 10-5	Count of total hits for artist on Google together with the search term "künstler" in 100000s.	0.1946759	0.6334514	0	12.75000

(own data)

As one can see, the span of the total number of English-language hits on Google (COUNT_EN) extends from 0 (Carlo di Giovanni Braccesco) to 1772000 (Andy Warhol). Close to the top there can be found Salvador Dalí (1676000), Pablo Picasso (1618000) and Vincent van Gogh (1585000). In total we made counts for 1805 artists.[39] The distribution shown in figure 17 is skewed to the left, which shows that many artists range in the lower regions of COUNT_EN. A small number of artists have an extremely high number of hits on Google, which could be interpreted as a possible superstar effect resulting out of a huge amount of artist-specific consumption capital.

[39] The artist named "BEN" had to be dropped due to an irregularly high number of counts. This is because of the generality of this name - even when connected with the search term "artist" or "künstler" respectively.

Figure 17 Distribution of Google hits



(own diagram)

When calculating the log values of COUNT_EN (COUNT_EN_LN) a quite astonishing picture comes to light: the distribution seems to be bi-modal, pointing towards two groups of artists in the sample - one at the high end and one at the low end of the sample. As the variables COUNT_EN and COUNT_DE are only independent variables in the forthcoming regressions, no quantile regressions have to be done. But to cater for this speciality separate regressions for the two groups of artists were carried out in order to check for differences.

The data about **expert appraisals** for an artist was taken from the Capital Kunstkompass (Rohr-Bongard, 2001) between 1970 and 2005.[40] This dataset covers the top 100 artists for each year determined by their participation in museum exhibitions, one-man and group shows, appearances in galleries, publications and so on. With these occurrences the quality and reputation of an artist is rewarded by the institutions

[40] The Capital Kunstkompass is released at the beginning of the Art Cologne each November. From 2007 this has changed, as the Art Cologne has moved its schedule to spring.

and its experts organising the exhibitions and publishing articles. For each occurrence, a specific number of points are awarded depending on the influence of the institution in the professional art world. When added up, these points specify the top 100.

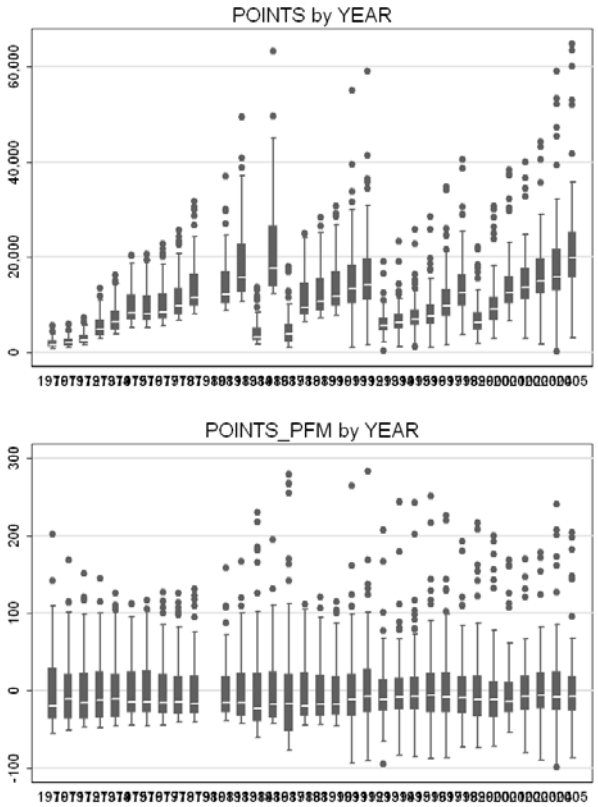
Table 15 Structure for Capital Kunstkompass Data

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.				
YEAR	Year of the Capital Kunstkompass.	1989.114	10.621	1970	2005
POINTS	Points for the artist.	11057.820	7600.700	150	64800
POINTS_PFM	Percentage from mean of points (centered points).	0	47.235	-99.133	284.234

(own data)

The resulting list is biased towards German artists and there are also some anomalies in the CKK dataset which are described in depth by Hutter el al. (2007). To overcome the limitations of these structural breaks over time, a variable POINTS_PFM (points percentage from mean) was created to cover the position of each artist relative to the mean number of points each year (this is commonly called centring).

Figure 18 Distribution of Capital Kunstkompass Points



(own diagram)

As one can see in figure 18, there is quite a homogeneous distribution of POINTS_PFM. There are some outliers in the high-end area between 100 and 300 % of the average given points, which could be the superstars we are searching for. The CKK data includes 3927 entries for 509 artists of the total sample and points were awarded ranging from 150 (Guo-Qiang Cai, 2004) to 64800 (Gerhard Richter, 2005).

The use and interpretation of the CKK points as an indicator for expert appraisals is to be discussed further, as this has been the topic of several other papers. As a criticism Bonus & Ronte (1997) say that "Bongard's weights are somewhat arbitrary" because the structure of the art market has changed over the years. As we centred the data (as described above) we overcame the restriction of the changing weights for awarding points in the CKK over the years. We only look at the position of each artist per year relative to the mean of the points awarded. Nevertheless Schneider & Pommerehne (1983) introduce "aesthetic evaluation" by experts using CKK points as a proxy, which confirms our view of CKK points as an indicator for expert appraisals. Connected to this, Singer (1990) has developed his own expert index with an analogous system for the American art market. He shows that the accumulation of reputation in the art world leads to the development of trade from the primary to the tertiary market and therefore rising prices. Grampp (1989) explained the correlation between prices and CKK points. Adding 10 % to the number of points awarded to an artist leads to an increase of 8 % in his prices on the market. Finally, Beckert & Rössel (2004) used the CKK as a basis for selecting artists for further analysis of their career. They found out that the reputation of an artist measured by CKK points plays an enormous role in determining the sale price of their works. All in all, one can say that there are good reasons for using the CKK points as a proxy for expert appraisals, as it is a good measure for the quality and reputation of an artist based on expert appraisals by several institutions and was used in this context several times.

The data about **income** respectively prices on the auction market was taken from Hislop's Art Sales Index (Hislop's Art Sales Index, 2006) for 2D works of art (oil, wa-

tercolours, drawings, prints and photographs). This data covers the international auction (tertiary) market.

Table 16 Structure for Auction Data

Data	Description	MEAN	SD	MIN	MAX
ID	Unique id for each artist.				
DATE	Date of the transaction.				
NAME	Name of the artwork.				
MEDIUM	Medium of the artwork. Dummies M_OIL (Oil), M_WCD (watercolours/drawing), M_PRI (print) and M_PHO (photo) were created.				
SIGNED	Dummy variable for a signed work.	0.6905	-	0	1
PRICE	Price of a work of art at transaction in US dollars on the basis of 2000 CPI.	93771.62	733128.8	205.98	98800000
SIZE	Size of the work in m^2.	0.4173	0.8565	0.0009	43.4343
AUCHOUSE	Auction house of the transaction. Dummies AH_SOT (Sotheby's), AH_CHR (Christie's) and so on were created for the auction houses covering more than 1 % of the total transactions.				

(own data)

The data was then reengineered in several ways. The currencies of the transaction prices were harmonised to US dollars and standardised to the American consumer price index of 2000 (PRICE), the size in square metres was calculated from the textual sizes given (SIZE) and dummies were created for the media used[41] and for the auction houses. For the complete number of 758 auction houses, only dummies for the houses covering more than 1 % of the total market were calculated.[42] As a result, we recorded 308778 transactions between 1954 and 2004 covering a period of 51 years.

Due to the visibility of the tertiary market, it is the only chance to obtain valid information about prices and therefore about the incomes of artists. But the connection between auction results and income requires some explanation. Artists, especially famous ones, mostly sell works of art via the secondary market (galleries, dealers). As this market is not visible to outsiders it is not possible to obtain valid information about

[41] Oil: M_OIL 46.74 %, Watercolour and Drawings: M_WCD 44.22 %, Prints: M_PRI 8.25 % and Photos: M_PHO 0.79 %

[42] Sotheby's: AH_SOT 30.7 %, Christie's: AH_CHR 23.8 %, Finarte: AH_FIN 2.2 %, Phillips: AH_PHI 1.5 %, Lempertz: AH_LEM 1.4 %, Hauswedell & Nolte: AH_HAU 1.4 %, Ketterer: AH_KET 1.2 %, Francis Briest: AH_FRA 1.1 %, Cornette de St.Cyr: AH_COR 1.0 %, Dorotheum: AH_DOR 1.0 %

prices.[43] But the prices realised there can be accounted as artist income to a certain extent (the price of a picture is usually divided 50/50 between the artist and his gallery). Because there is an interconnection between gallery and auction prices, it can be assumed that high prices at auction result in high prices in galleries, which consequently result in higher incomes for artists. This assumption is likely to be reinforced further in the future as a result of the introduction of "Droit de Suite" in the EU, whereby artists are to gain from all transactions involving their art. (Rushton, 2001, Stanford, 2003)

To sum up, the calculations below are based on the following assumptions. (1) The total number of Google hits concerning an artist are a good proxy for his **artist-specific consumption capital**, based on media attention and public response to this popularity. (2) The points awarded by the Capital Kunstkompass are a good proxy of **expert appraisals** for quality and reputation of each artist. (3) The auction market and the prices realised are a good indicator of the **income** of artists and therefore an indicator of superstardom.

(4) Results

The following tests try to find connections between the presented indicators of artist-specific consumption capital, expert appraisals and the realised price at auction. First, the influence of the artist-specific consumption capital on auction prices is evaluated in (a). Then the influence of expert appraisals is analysed in depth in part (b). After this, the connection of these two models is tested in part (c) in order to obtain a clearer picture at the level of both influencing factors.

(a) Differences in artist-specific consumption capital

In order to search for the influence of artist-specific consumption capital on the prices attained by works at auction, a hedonic regression with all the available price-influencing factors was carried out. A dummy for the medium of the work of art was introduced. On the basis of older studies it is to be expected that works in oil will have

[43] For discussion of the difference between price formation mechanisms in auction and gallery markets see HUTTER, M., KNEBEL, C., PIETZNER, G. & SCHÄFER, M. (2007) Two Games in Town. A Comparison of Dealer and Auction Prices in Contemporary Visual Arts Markets. *Journal of Cultural Economics,* 31.

the highest positive effect on price. Also signed works are expected to fetch a higher price. The size definitely has an effect on the resulting price, but this effect should weaken the larger the work is. Finally, the variable GOOGLE was introduced and expanded in extending powers between 2 and 9 to test for the influence of the consumption capital stock. Where the phenomenon of superstardom is concerned, a disproportionately large positive effect on price is expected the higher GOOGLE is. This model was transformed into the following specification (as an example with GOOGLE up to the fourth power):

$$\ln(PRICE\_CPI) = \alpha_0 + \alpha_1 \Sigma MEDIUM + \alpha_2 SIGNED + \alpha_3 SIZE + \alpha_4 SIZE^2 + \alpha_5 GOOGLE + \alpha_6 GOOGLE^2 + \alpha_7 GOOGLE^3 + \alpha_8 GOOGLE^4 + \alpha_9 \Sigma YEAR + \alpha_{10} \Sigma AUCHOUSE$$

M_OIL, YEAR2000 and AH_SOT were used as reference categories for the upcoming robust OLS regressions[44]. The resulting factors of the first regression printed in model (1) of table 17 are very convincing for the application of GOOGLE in the fourth power: The media watercolour and drawings (-95.2 %), prints (-128 %) and photographs (-63 %) generate lower prices than works in oil. The signature of a work of art has a positive effect of 22.1 % on the resulting price. Every square metre of a work of art adds 47.4 % more onto the price, with the effect being smaller the larger the work is. The maximum price is paid for works of art with a surface area of 11.74 m^2. The dummies for the years give a very good representation of the commonly known price indexes for visual arts. In 1989/90 the years of the international boom are evident, as well as the general upward trend of prices.[45] The influences of the auction house are also as expected. Sotheby's and Christie's obtain the highest prices on the market. Finarte, for example, attains prices about 14.4 % lower than Sotheby's when selling

[44] Fixed or random regressions based on the artist are not suitable in this case because there is a close connection between GOOGLE and the artist. Nevertheless, these regressions were tested but the variables containing GOOGLE information were dropped due to the expected co-linearity.
[45] For a more detailed description see figure 23.

equivalent pieces. This is because a selection effect of auction houses exists in art markets.

Table 17 Regression Results for Models (1) to (7)

	(1) GOOGLE ALL ln(price)	(2) GOOGLE LOW ln(price)	(3) GOOGLE HIGH ln(price)	(4) CKK ALL ln(price)	(5) CKK REDUCED ln(price)	(6) COMB. ALL ln(price)	(7) COMB. REDUCED ln(price)
m_wcd	-0.952 (128.56)**	-0.829 (64.07)**	-1.019 (119.09)**	-0.649 (24.94)**	-0.674 (24.22)**	-0.640 (24.70)**	-0.664 (23.91)**
m_pri	-1.281 (136.24)**	-1.035 (58.32)**	-1.414 (126.32)**	-1.469 (48.73)**	-1.246 (36.10)**	-1.481 (49.32)**	-1.243 (36.15)**
m_pho	-0.636 (29.01)**	-0.760 (19.37)**	-0.615 (23.45)**	-0.783 (21.82)**	-0.654 (17.11)**	-0.766 (20.96)**	-0.633 (16.23)**
signed	0.221 (36.63)**	0.163 (14.90)**	0.250 (35.16)**	-0.003 (0.15)	-0.001 (0.05)	-0.004 (0.17)	-0.002 (0.09)
size	0.474 (21.61)**	0.583 (16.92)**	0.426 (17.84)**	0.580 (33.02)**	0.546 (32.85)**	0.586 (33.08)**	0.552 (32.98)**
size_2	-0.021 (6.09)**	-0.028 (5.09)**	-0.018 (4.89)**	-0.026 (12.01)**	-0.024 (12.13)**	-0.026 (11.95)**	-0.024 (12.11)**
ckk_points_pfm				0.663 (24.11)**	0.655 (19.87)**	0.651 (23.62)**	0.635 (19.09)**
ckk_points_pfm_2				-0.185 (11.19)**	-0.132 (4.76)**	-0.191 (11.53)**	-0.117 (4.22)**
google * 10-5	0.165 (16.33)**	113.208 (12.26)**	0.295 (24.24)**			-2.208 (11.49)**	-2.009 (9.74)**
google_2 * 10-5	-0.071 (17.97)**	-32,726.418 (20.22)**	-0.110 (24.40)**			5.385 (9.57)**	4.941 (8.19)**
google_3 * 10-5	0.010 (21.38)**	1668545.283 (23.02)**	0.014 (26.96)**			-3.849 (8.40)**	-3.590 (7.34)**
google_4 * 10-5	-0.000 (21.98)**		-0.001 (27.10)**			0.793 (7.39)**	0.741 (6.51)**
year1970 - year 2004	[46])						
Christie's	0.423 (62.76)**	0.378 (30.38)**	0.439 (55.40)**	0.270 (13.96)**	0.274 (12.57)**	0.265 (13.65)**	0.269 (12.26)**
Finarte	-0.144 (9.95)**	-0.136 (6.29)**	-0.166 (8.51)**	-0.349 (6.72)**	-0.239 (4.02)**	-0.327 (6.37)**	-0.223 (3.85)**
Lempertz	-0.381 (20.38)**	-0.497 (14.06)**	-0.321 (14.44)**	-0.855 (21.46)**	-0.849 (20.61)**	-0.853 (21.13)**	-0.853 (20.55)**
Cornette de St.Cyr	-0.668 (26.23)**	-0.415 (9.20)**	-0.762 (25.48)**	-0.644 (7.48)**	-0.681 (7.85)**	-0.664 (7.70)**	-0.691 (8.04)**
Ketterer	-0.248 (13.29)**	-0.256 (6.46)**	-0.208 (9.60)**	-0.888 (14.38)**	-0.877 (13.22)**	-0.872 (14.20)**	-0.859 (13.05)**
Dorotheum	-0.643 (26.96)**	-0.697 (16.55)**	-0.659 (22.50)**	-0.791 (13.73)**	-0.751 (12.14)**	-0.757 (13.62)**	-0.718 (11.98)**
Francis Briest	-0.229 (9.52)**	-0.296 (6.96)**	-0.200 (6.99)**	-0.463 (5.35)**	-0.625 (6.35)**	-0.495 (5.79)**	-0.656 (6.77)**
Hauswedell & Nolte	-0.010 (0.55)	-0.045 (1.16)	0.027 (1.29)	-0.844 (12.66)**	-0.834 (12.20)**	-0.858 (13.05)**	-0.852 (12.70)**

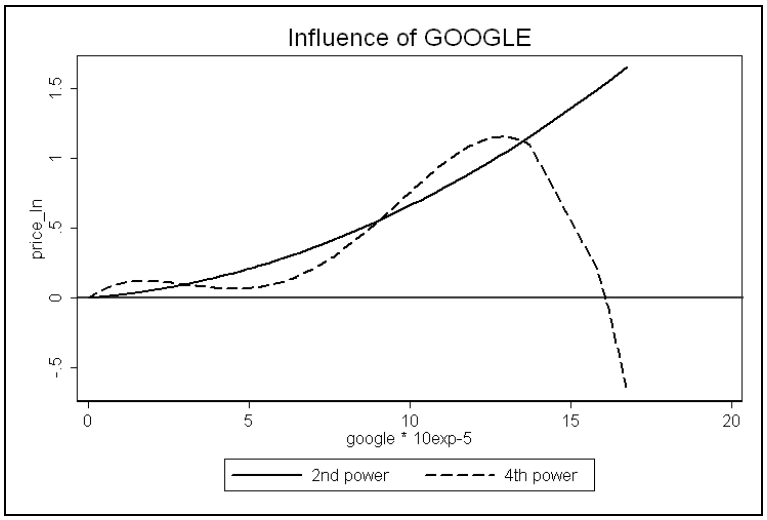
[46] Detailed regression results are omitted here as they are plotted in figure 23. Please contact author for more information.

Phillips	-0.366 (16.02)**	-0.254 (5.87)**	-0.403 (15.28)**	0.130 (2.24)*	0.111 (1.85)	0.132 (2.27)*	0.122 (2.03)*
Constant	9.479 (562.68)**	9.644 (286.39)**	9.394 (473.12)**	9.708 (206.32)**	9.624 (182.39)**	9.778 (206.03)**	9.686 (182.81)**
Observations	308778	85046	223732	19115	14616	19115	14616
R-squared	0.22	0.22	0.23	0.41	0.43	0.42	0.44
Robust t statistics in parentheses							
* significant at 5%; ** significant at 1%							

(own data)

When looking at GOOGLE, an astonishing result comes to light. GOOGLE fits into two specifications, the ones with second and fourth power. Both models show a growing positive effect of artistic capital stock on prices at auction. Significance levels for the models with powers 3, 5, 6, 7, 8 and 9 were not reached. To illustrate the different effects of the significant specifications, regression lines for GOOGLE were drawn in figure 19.

Figure 19 Regression Lines for Google



(own diagram)

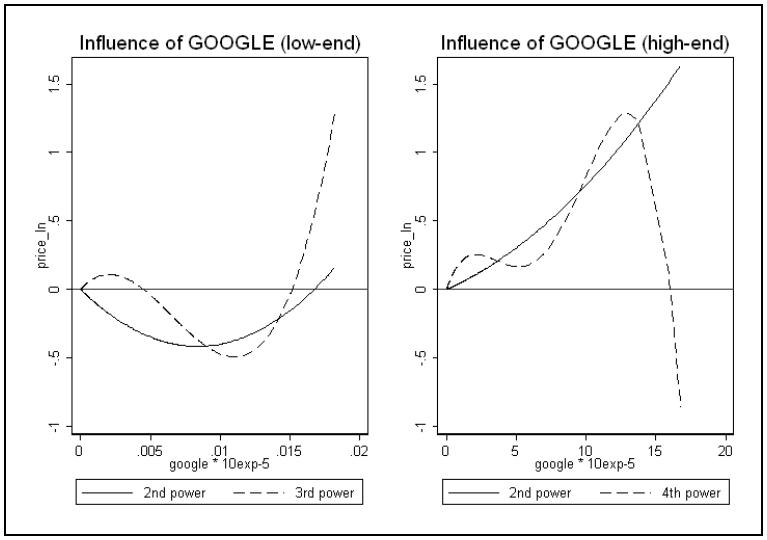
Analysis of the model including GOOGLE and GOOGLE^2 (second power) shows that a positive influence on price with a growing marginal revenue of additional hits on Google can be found for the full range, suggesting the existence of superstardom. Comparing this with the model for the fourth power of GOOGLE, a plateau beneath a general positive influence can be shown. At the low end (up to 176000 hits) the influence increases; between this local maximum and 451000 hits (minimum of the plateau) the influence decreases again; it then increases significantly between this minimum and 1.289 million hits. Up to this maximum, the two specifications representing the second

and fourth power correlate and confirm the existence of superstardom. Surprisingly, after the maximum at 1.289 million hits on Google, the effect of GOOGLE decreases significantly, unlike the specification with the second power. As only seven artists have hits higher than 1.289 million (Yoko Ono, Claude Monet, Raphael, Vincent van Gogh, Pablo Picasso, Salvador Dalí and Andy Warhol) it has to be assumed that for these "stars of the stars" other factors exist which have a stronger effect on the resulting price at auction than their artistic capital stock measured by Google hits. These may be trends favouring young art, genre effects, death effects[47] or similar anomalies. With hits exceeding 1.609 million, a negative effect of GOOGLE can even be shown. This only affects Pablo Picasso, Salvador Dalí and Andy Warhol, and again the question arises as to how this is to be explained. Probably these artists, or at least their names, are common knowledge even among those sections of the public who are not interested in art and therefore the high number of hits cannot be explained by a high degree of artist-specific consumption capital only in the arts sector. This result is definitely not as expected and does not confirm the theory of superstardom as regards the highest end of the popularity stakes among artists.

To evaluate these results more closely, two additional regressions were done in respect to the bi-modal distribution of GOOGLE. The sample was split into a low-end and high-end group of artists (see the distribution of the logarithm of this variable presented in chapter 3). Again several robust OLS regressions were done to find the best specification for Google's influence on prices. The models (2) and (3) in table 17 show the respective results. The corresponding regression lines for the significant specifications are also drawn, depicting the influence in graph form in figure 20.

[47] See FRICK, B. & KNEBEL, C. (2007) Is there really a 'Death Effect' in Art Markets? , Witten/Herdecke University. for a further analysis of death effects in the visual arts.

Figure 20 Regression Lines for Google (2 groups)



(own diagram)

Again two specifications fit the presented model on significant levels. The specification with GOOGLE in second power and the regressions with the third and fourth power, respectively, of GOOGLE are suited to the data. As one can see in the lower regions of Google hits, an effect of around 0 or lower can be shown up to 1512 hits in the third power specification (1674 hits in the second power). After this, a positive effect of Google hits on prices is shown. This can be interpreted as indicating that an artist requires a certain level of attention in the media to build up a stock of consumption capital and to gain positive effects on his prices at all. The importance of this basic attention is very high in order to establish prices on the market. Below this visibility threshold an effect close to zero or in the negative is shown, which means that artists who are not known very well (or at all) fetch significantly lower prices at auction than their better known colleagues. The regression lines of the high-end artists are quite similar to the presented results of model (1) and therefore need not be explained again.

In conclusion, it may be stated that all the factors of the regression show the expected results, except that in some respects the influence of GOOGLE differs from the assumptions. The total hits for an artist's name on Google (his or her media attention and public response resulting in artist-specific consumption capital) is important at the low end in order to achieve visibility on the market at all and therefore to reach a certain price level. After crossing the visibility threshold, an "attention plateau" allows for

only small differences in prices, but growing marginal revenues can be realised once the artist advances to the high end of the market. Up to this point the existence of the superstar effect can be confirmed. After this climax a "hall of fame" seems to be reached, where the influence on price of attention measured in terms of Google hits decreases. Possible explanations could be that other mechanisms influencing the price step in here (trends, genre, death and so on), and therefore the hits represented by Google do not differentiate this effect sufficiently. Nevertheless, these confusing results - decreasing marginal revenues of attention where the number of Google hits is highest - affect only a small number of artists, so that to a certain extent the existence of superstardom has been shown successfully in the context of artist-specific consumption capital.

(b) Differences in expert appraisals

A similar hedonic regression with the following model was done with the combined dataset of Capital Kunstkompass and auction prices to isolate all price-influencing factors and the effect of the CKK_POINTS. Among the assumptions presented in (a) was the expectation of a positive and growing effect of the points awarded in the Capital Kunstkompass in fulfilling the criteria of superstardom.

$$\ln(\text{PRICE\_CPI}) = \alpha_0 + \alpha_1 \Sigma \text{MEDIUM} + \alpha_2 \text{SIGNED} + \alpha_3 \text{SIZE} + \alpha_4 \text{SIZE}^2 + \alpha_5 \text{CKK\_POINTS\_PFM} + \alpha_6 \text{CKK\_POINTS\_PFM\_2} + \alpha_7 \Sigma \text{YEAR} + \alpha_8 \Sigma \text{AUCHOUSE}$$

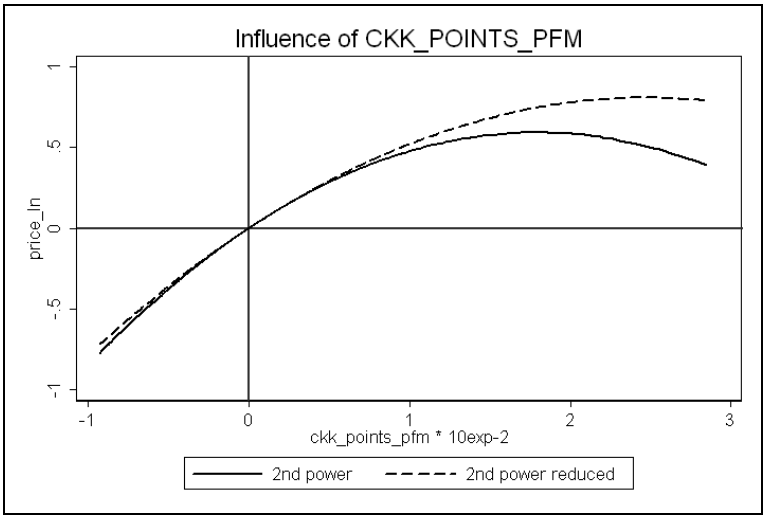
As reference categories the dummy variables M_OIL, YEAR2000 and AH_SOT were used again. The results of the robust OLS regression are shown in table 17 model (4).

In the resulting regression all variables correspond well to the assumptions presented for (a) and to the results of several other studies. Watercolours and drawings seem to be 64.9 %, prints 146.9 % and photos 78.3 % cheaper than oil works with the same characteristics. Unfortunately, the influence of the signature on the works of art

shows no significance in this model, which may be explained by the irrelevance of originality information for high-end artists as they are covered by the CKK. In this model, an additional square metre of work again adds 58 % to the price, the effect being less strong in the case of larger works and with the highest prices being attained by works of 11.05 m^2 (turning point). The dummies for the years and auction houses show expected and similar results as in (a), with the difference that Phillips as an auction house has a positive influence on prices, amounting to 13 % in this model. This can be explained by the different artists included in the overall sample in interconnection to a selection effect of auction houses. The selection bias of the CKK does not represent the market as completely as with the model presented in (a).

Coming to the effect of the CKK points, our assumptions were partly confirmed at significant levels. The general influence of CKK points on price is positive, with a growing number of points corresponding to higher prices being achieved. Astoundingly, however, this effect weakens in the case of the top-ranking artists (the suspected superstars) rather than intensifying. The maximum influence is reached at 179.328 % over the average awarded CKK_POINTS, in which case the resulting prices are 59.47 % higher. Artists being awarded more than this maximum percentage away from the mean are Joseph Beuys (1986, 1991-2000, 2004, 2005), Sandro Chia (1984), Francesco Clemente (1984, 1987), Enzo Cucchi (1987), Mimmo Paladino (1984, 1987), Bruce Nauman (1994-1998), Robert Rauschenberg (1970), Gerhard Richter (2004, 2005), Julian Schnabel (1984, 1987) and Andy Warhol (1999, 2000, 2004, 2005) - one can easily find them by looking at figure 18. Five of the artists appearing only in the years 1984 and 1987 have been listed in the CKK as “newcomers” (young artists below the age of 40; see chapter 3). The remaining artists could be described as superstars, but again the influence of CKK on the prices of works by these artists is lower than for others (but it remains positive). See the regression line (second power) in figure 21 for an illustration of the influence of the CKK_POINTS on the price at auction.

Figure 21 Regression Lines for Capital Kunstkompass Points



(own diagram)

As the CKK also includes data about dead artists, and since the lists of 1980, 1984 and 1987 (young artists under 40 years of age, representing trends in contemporary art) seem to disturb our analysis, this information was dropped for a second regression (see table 17 model (5) and the regression line for second power "reduced"). All variables move along the presented trends, except that the maximum influence of CKK is reached here at 247 % over the mean of awarded points, adding 81 % onto the price at auction. The effect shown for this sample is stronger and does have a turning point where there are no artists in the sample who have had higher points awarded to them. Therefore for the whole sample prices grow when higher points are awarded. But also decreasing marginal revenues of additional points awarded can be found - contradicting the superstar effect, where increasing marginal revenues are a must. To test this result for validity, regressions with higher powers from 3 to 9 of CKK_POINTS_PFM were also done but the influencing variables did not reach significance. This confirms the results presented above and is in need of explanation.

The explanation could be that the top 100 selection of the CKK includes a sample selection bias in favour of superstars. The CKK only includes artists who have the 100 highest numbers of points for expert appraisals and therefore we only see superstars in this top 100 list. Owing to the omission of less appraised artists, the analysis cannot say anything about the influence of expert appraisals from the low- to the high-end of art-

ists - the results presented here are only valid for the high-end artists. For this special sample a superstar effect could not be shown. The points awarded by the CKK show decreasing marginal revenues on the resulting price at auction.

Since the existence of superstardom is highly reliant on the non-substitutability of the artists and their artistic goods, another explanation can be given: namely, that the artists and works of art by this high-end group could be substitutable. This sounds confusing in view of the different genres, oeuvres, colours, techniques and so on. But in economic terms works of art have several utilities, namely storage of value and speculation - representing the material utilities; and consumption (aesthetic dividend) and status - representing immaterial utilities or private-value components.[48] As regards these factors the artists and their works could, at least to a certain extent, be close substitutes. When this assumption is accepted it is no wonder that no evidence of superstardom could be shown on the basis of the presented connection between CKK points and prices, since the analysis concerned a group of artists who are exchangeable and are therefore probably all superstars within their respective genres and co-exist. Coming again to the differentiation between low-end and high-end artists, there the substitutability is questionable because of fundamental differences in the utilities. As a result, superstar effects may exist between low- and high-end artists but these could not be shown by the presented analysis of the influence of the Capital Kunstkompass, since this takes account only of the high-end market of substitutable artists.

(c) Connecting expert appraisals and artist-specific consumption capital

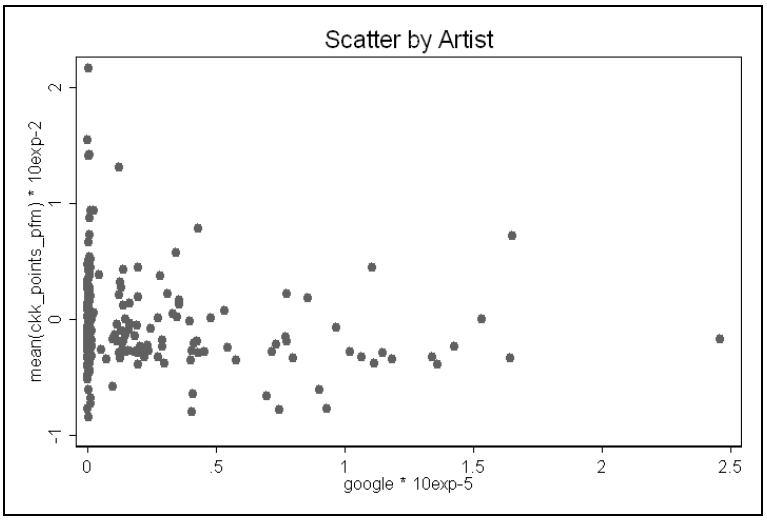
Quite obviously, the presented price-influencing factors, namely the number of points awarded in the Capital Kunstkompass and the numbers of hits obtained by the Google search engine, are interconnected and show aspects of both sides of a coin. In analogy to Garcia-del-Barrio & Pujol (2007) we present the following explanation: CKK points give a professional judgement of the quality and presence of an artist in

[48] For more information on art as an asset class and its value components see FREY, B. S. & POMMEREHNE, W. W. (1989a) Art Investment: An Empirical Enquiry. *Southern Economic Journal,* 56 396-409., GOETZMANN, W. N. (1993) Accounting for Taste: Art and the Financial Markets over Three Centuries.

the professional world of arts, resulting in an indicator of expert appraisals. As the public very often has little interest in professional appraisals of an artist, but is interested in his or her spectacular (and understandable) works of art, recording the number of Google hits gives an indication of the public popularity of an artist and the consumption capital available for the public. When professional appraisal and general popularity are combined, it is probably possible to arrive at a valid explanation of the prices paid for works by an artist and therefore of his or her status as a superstar, thus shedding some more light on the results presented above.

In order to analyse this theoretical connection, a dataset containing both information from the Capital Kunstkompass and the number of total hits on Google was created. In contrast to the model set out above, this time the number of Google hits was taken from the German site (GOOGLE_DE) so as to maintain comparability between the German-biased CKK and the Google hits. To test the theoretical interconnection, a correlation between both variables was carried out. With a correlation factor of -0.1417 between GOOGLE_DE and CKK_POINTS_PFM it can be seen that no connection at the level of the data exists. To illustrate this, figure 22 shows the scatter plot of CKK_POINTS_PFM (mean by artist) and GOOGLE_DE:

Figure 22 Scatter Plot with Google Hits and Capital Kunstkompass Points



(own diagram)

American Economic Review, 83 1370-1376. and FREY, B. S. & EICHENBERGER, R. (1995a) On the Return of Art Investment Return Analyses. *Journal of Cultural Economics,* 19**,** 207-220..

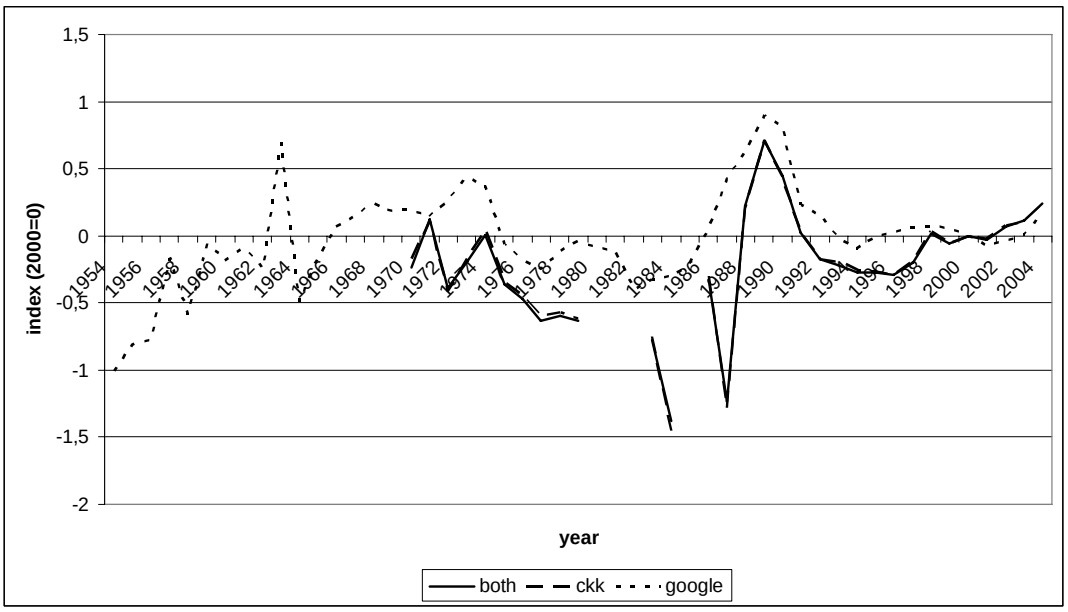
Because of this statistical independence it is possible to form a regression model containing both sets of information, as presented in the models below:

$$\ln(PRICE\_CPI) = \alpha_0 + \alpha_1 \Sigma MEDIUM + \alpha_2 SIGNED + \alpha_3 SIZE + \alpha_4 SIZE^2 + \alpha_5 GOOGLE + \alpha_6 GOOGLE^2 + \alpha_7 GOOGLE^3 + \alpha_8 GOOGLE^4 + \alpha_9 CKK\_POINTS\_PFM + \alpha_{10} CKK\_POINTS\_PFM\_2 + \alpha_{11} \Sigma YEAR + \alpha_{12} \Sigma AUCHOUSE$$

With this model a robust OLS regression was done. The results can be seen in table 17 model (6). Again all variables correspond quite well with the assumptions: water-colours are 64 %, prints 148.1 % and photographs 76.6 % cheaper than works in oil. The signature again has no significant influence due to its unimportance for the high-end artists contained in the CKK. With each additional square metre of a work the price increases by 58.6 %, with a decreasing influence on larger works (the maximum price is reached at 11.26 m^2). The yearly dummies confirm the general price trend, which is also illustrated in figure 23[49]. With regard to the auction houses, Phillips (13.2 %) and Christie's (26.5 %) attain higher prices than Sotheby's (the reference category). All other houses have lower prices, e.g. Finarte with -32.7 %.

[49] When comparing the resulting hedonic price indexes quite a good picture develops. With the exception of 1963 for the index resulting from the Google regression and 1980, 1982 and 1985 for the regression with Capital Kunstkompass, the index represents the market developments as shown in other papers.

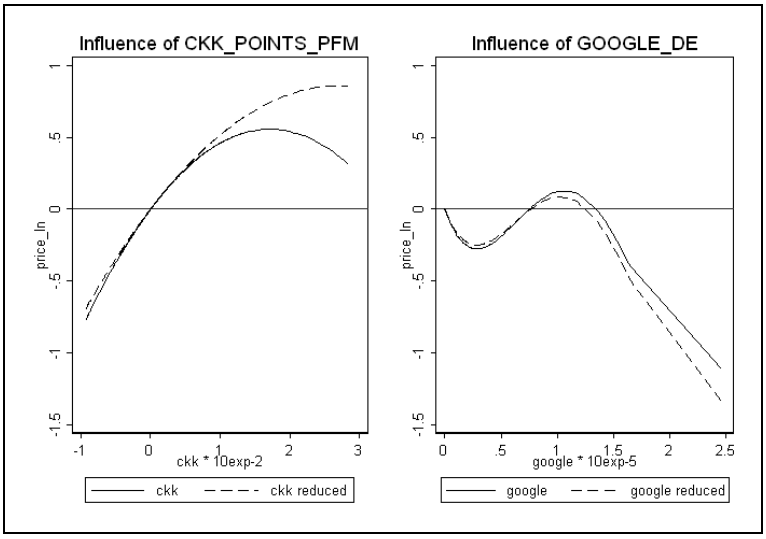
Figure 23 Hedonic Price Index 1954 to 2004



(own diagram)

Examination of the GOOGLE and CKK variables confirmed the results presented above. The influence of the points awarded in the Capital Kunstkompass show similar values to those in model (1) presented in (b). As regards the influence of Google hits, a slightly different picture emerges. A general positive influence of GOOGLE on the resulting price can no longer be discerned. There is only a small range of positive values between 74975 and 134705 hits, with a maximum influence of 12.7 % on price at 106393 hits. When the number of hits concerning an artist is either below or above this range, the influence on price is negative. Both results are presented in regression lines in figure 24 below.

Figure 24 Regression Lines for Google Hits and Capital Kunstkompass Points



(own diagram)

Also a regression was done with the dead artists and the years 1980, 1984 and 1987 being deleted, owing to the reasons presented in (b). The results are presented in table 17 model (7) and are displayed in the regression lines as "reduced". Here again the influence of CKK corresponds to the expectations as calculated in (b), but the influence of GOOGLE is negative for most numbers of hits, except within a small range between 76250 and 126054, with a maximum being reached at 102448 where 8.4 % was added to the price at auction. When the results are viewed on the same scale, the weakness of Google hits as an indicator in comparison with the influence of CKK also comes to light. It would seem that the hits on Google have a smaller impact than the CKK points.

But how are these results to be explained, considering that they partly confirm and partly diversify the results recorded in (a) and (b)? Of course, the selection bias introduced by the CKK has to be analysed. As already mentioned, the CKK focuses on the German-speaking area and only prints the top 100 list for each year - in contrast to the data used in (a) which focused on the international and English-speaking art market involving a much larger number of artists from the low to the high end. The selection of the CKK naturally focuses on the supposed superstars of the whole art market. When related to the results presented here, it would seem that the number of points awarded by the CKK has a positive effect on prices with decreasing marginal revenue at the high end. The influence of Google hits seems not to be so relevant for the sample of the

CKK artists, which indicates that high-end artists do not rely so much on public attention as on expert appraisals to establish high prices.

(5) Conclusion

In the theoretical section 2 it has been possible to show that the theories developed so far seem to be suitable for application to the art market and do make sense in this context. Researchers have independently given several indications which fit well into the image of what constitutes superstardom, thus confirming its existence in an anecdotal way. It has been found that the importance of talent for the creation of superstardom in the visual arts seems to be reduced due to problems of evaluation for the public. In this context the role of experts and their appraisals and the artist-specific stock of consumption capital are of greater relevance. These factors are actively influenced by so called middle-men, experts and the media in our times, who actively influence the transformation of artists into superstars. Furthermore, these reasons for the development of superstardom have been transformed for the purpose of this study into testable hypotheses.

With regard to the test itself, the results are mixed. For less well known artists the specific consumption capital, represented by the total number of hits on Google, is an important factor for the resulting prices at auction. A certain level of public familiarity is needed for positive effects on price and income to be realised. With growing consumption capital the effect on prices at auction increases with growing marginal revenues up to a tipping point. Beyond this tipping point, affecting only a few artists who enjoy extremely high levels of popularity, the influence of Google hits significantly decreases - a strange phenomenon for which other factors seem to be responsible. In general, however, it can be stated that a connection between superstardom and artist-specific consumption capital can be shown. This result constitutes evidence that Adler's theory concerning the necessity of accumulating consumption capital in order to become a superstar can be confirmed for the visual arts.

With regard to the high-end market, artist-specific consumption capital is not sufficient to explain the resulting prices. Here expert appraisals of quality and reputation, like those of the Capital Kunstkompass, are more important factors in explaining the differences. The effect of points awarded in the Capital Kunstkompass is positive over the full range of points but shows decreasing marginal revenues. Therefore MacDonald's theory can only be partly confirmed, i.e. while expert appraisals have a positive effect on becoming a superstar, this influence shows no positive quadratic interrelation. Substitutability and a sample selection bias focusing on the high-end artists in the presented analysis seem to be responsible for this.

In general this points towards the importance of the so called middle-men on the art market who have a direct influence on both expert appraisals and the artist-specific capital stock. In the visual arts the artist himself seems only to be responsible for laying the foundations of his or her career and therefore stardom. In order to advance into the highest echelons of the art market, powerful promoters are needed to push the artist's presence in the media and establish his reputation among the experts and the public, which if done successfully can result in very high incomes.

The artist-specific consumption capital stock and expert appraisals, in this respect, are good indicators for distinguishing the famous artists from the less well known. It seems as if an established circle of stars has been defined by the public and expert appraisals, and the superstars from among this circle periodically alternate in accordance with rules set out by the experts. Admission to this charmed circle requires a certain degree artist-specific consumption capital combined with excellent expert appraisals.

Finally, the presented statistics do not prove beyond doubt the existence of superstardom in the visual arts. There are few artists who earn a great deal more than their colleagues and dominate the market. This is mainly because of differences in the stock of consumption capital, shown by the number of results for a Google search reflecting the popularity of an artist, and different appraisals by experts, shown by reference to the Capital Kunstkompass. But along with these general facts, which are valid for most

of the artists, there are phenomena at the high end which militate against the existence of superstardom but can be explained with some theory.

5. Conclusion

This thesis provides three examples of an imperfect market for perfect goods. It was the aim of this dissertation to add impetus to research on the economics of the fine arts and to widen the research agenda. By finding new topics which have not previously been focused on in detail and by using new data to prove the results, this aim has been fulfilled completely. Nevertheless, it is worth considering the outcomes of this thesis more closely.

Another aim of this thesis was to provide an overview of the history and foundations of research in the field of the economics of the fine arts. In chapter 1 the history of research in this subject area was outlined using two classifications and the need for further research in particular areas was shown. Chapter 2 set out the required foundations for understanding the topics presented in this thesis. The numerous classifications of art were presented as a mixture of tangible and intangible characteristics. Then the art market itself and its actors were introduced in order to show that difficult structures exist which are far from constituting a perfect market organisation. Next, the resulting pricing mechanisms were set out, which are also far from reflecting a perfect market.

Beginning with chapter 3, this thesis presented a major step forward in research in this field. On the basis of auction data, a dataset of unprecedented volume was accumulated, which made it possible to conduct some interesting calculations. As regards the secondary market, the price information given in the Capital Kunstkompass partly solves the problem of visibility on this market. Thus, this thesis investigated the pricing of art in the secondary and tertiary market, resulting in the analysis presented in chapter 4.1 above. In order to consider the softer aspects of the art markets, reputation and popularity data was used, based on the total number of Google hits for certain searches. In particular, the data about the popularity of artists has never previously been introduced into economic art market analyses and has therefore added worthwhile information. This information, combined with the afore-mentioned price information, has made it possible to investigate new aspects, such as the concept of superstardom presented in chapter 4.3. Hence, one conclusion

from this thesis is that when different in-depth data on the same subject are combined, interesting and new results can be produced.

Coming to chapter 4, three analyses have been presented that show state-of-the-art research in the economics of the visual arts. Three special topics have been analyzed using similar data and methodology but with reference to different topics taken from the daily business of the art market. Each of the analyses has its own specific conclusion, which will not be presented here again, but one general conclusion remains: namely, that adapting research results from cultural economics to the fine art markets is an interesting area of research which adds new insights into art markets and their strange behaviours. By taking advantage of the new technical possibilities of data analysis, these insights can be proved and therefore add relevance for practitioners in the art markets.

To follow up my ideas in the future, the methods presented here can be used in various fields of research in connection with cultural economics and therefore be adapted to this wider field, encompassing the performing arts, music markets, the film industry and even classic areas such as publishing.

As well as adapting my research methods to other fields of cultural economics, it will also be possible to conduct further research in the fine arts and the respective markets. A field often mentioned but never analyzed in detail is the area of behavioural economics. The application of economic theories to this area of research has been very fruitful, e.g. in the area of investment analysis or for understanding the "homo oeconomicus". Possible future topics of analysis might be January, holiday, Christmas and small-firm effects, or endowment, opportunity-cost and sunk-cost effects using the kind of data presented above. This would undoubtedly shed some more light on the dynamics of supply and demand. In addition, game theory is predestined to be adapted for the arts markets, but so far it has not been used extensively in this context.

Amongst all these ideas, I hope that this thesis has fulfilled its aim of affording new insights into the fine art market and its anomalies, as well as showing the way to fulfil this

aim, namely by making full use of the possibilities of the modern media and the latest technology to gather new data and combine it in innovative ways.

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Appendix A:

Data Sources for Art Market Information

Name	Author / Source	Data	Time span	Description	Price
absolutearts.com	http://www.absolutearts.com	Information Artists, Art Movements, Biographies and Artwork		"Buy contemporary art, get art news, purchase art from our 24,000+ artists and art galleries - online since 1995." Belongs to http://www.wwar.com.	
ADEC International Art Price Annual: Annuaire des Cotes	Michel, E.	Auction prices: Fine arts	1988 - today	For 1988 only French auction data. Since 1989 also Western Europe, North America, Japan and Scandinavia. Entries in English and French. Online data available at artprice.com.	Book: 99 EUR per year
Artcyclopedia: The Fine Art Search Engine	http://www.artcyclopedia.com	Information: Museums quality artists and resources		There was compiled a comprehensive index of every artist represented on over 2300 art sites. There are offered over 95000 links to as estimated 180000artworks and 8200 renowned artists. The focus is drawn on museums quality artists.	
Art Sales Index Ltd.	Hislop, R. http://www.art-sales-index.com	Auction and dealer prices: Fine arts	1920 - today	Often used data source. A season runs from August until July. Over 2.8 million transactions of over 250000 artists. Drawings are listed since 1976, sculptures since 1983. Only works beginning with a value of 250 USD.	Book, CD, Online: 150, 449 and 750 EUR per year

Artfact Inc.	http://www.artfact.com	Auction prices: Fine arts, antiques, jewelry	1986 - today	More than 5 million auction results with texts and pictures from catalogues. Merged with Invaluable.com in 2007.	Online: 1995 USD per year
Artfacts.Net	http://www.artfacts.net	Information: Artists, Exhibitions, Galleries and museums		"Artfacts.Net is an international online gallery and museum guide for modern, contemporary and emerging art." Also there is offered an artist ranking.	
art-in.de	http://www.art-in.de	Information: Contemporary art market		German internet for auction houses, museums, galleries, exhibitions and artists focussing on contemporary art.	
ARTINFO.com	http://www.artinfo.com	Information: News, events, artists, galleries and art market		"ARTINFO.com offers breaking news, profiles of top and emerging artists, stories about collectors and collecting, gallery round-ups from around the world, the best of student art, market trends and analysis, and detailed coverage of art fairs."	
artist-info.com	http://www.artist-info.com	Information: Contemporary art		artist-info.com is a portal and a marketplace for contemporary art.	
Art Market Research	http://www.artmarketresearch.com	Auction prices: Fine arts	1985 - today	Only offers ready-calculated indices.	

artnet.com	http://www.artnet.com	Auction prices: Fine arts	1985 - today	Over 2.4 million entries of 500 auction houses out of 28 countries. Over 176000 artists. Entries partly with pictures.	Online: 30 searches per month for 80 USD
art-online	http://www.art-online.com	Information: Fine art internet directory and search engine		Similar internet directory to Yahoo focussing on fine art. A service by artprice.com.	
artprice.com	http://www.artprice.com	Auction prices: Fine arts	1987 - today	Over 3.7 million entries with more than 306000 artists out of 270000 catalogs of auction houses. Partly with text and pictures. Older art sales available as a book.	Online: 99 USD per year
ART FRONT PAGE	http://www.artpost.info	Information: Press, exhibitions and openings		"ARTPOST.info was launched in 2003. It is an online art information portal with up-to-date international exhibition information from galleries and museums."	
artvalue.com	http://www.artvalue.com	Auction prices: Fine arts	1987 - today	Over 160000 artists are referenced in this database with approximately 1500000 auction results and an average of 900 auction houses. This service is based on the Guide Mayer which was bought in 2001 by the ARTVALUE SA.	Free and unlimited online access

AskART	http://www.askart.com	Auction prices: American and international fine arts	unknown	Over 32000 North American artists with auction prices and catalogue information. The service was extended in 2007 to the international art market covering over 100000 artists.	Online: 19,50 USD per month
d'ART	http://www.fine-art.com	Information: Galleries and artists		"d'ART is a marketplace and community of fine artists and dealers." Over 4000 worldwide artists offered by their galleries. Focussing on the secondary market.	
Davenport's Art Reference & Price Guide	Davenport, R.J. http://www.gordonsart.com	Auction and dealer prices: Fine arts	unknown	More than 250000 international artists with price information. Is offered on a yearly updated basis.	Book, CD, Online: 159, 185 and 240 USD per year
Falk's Art Price Index	Falk, P.H.	Auction prices: Fine arts	1992 - today	Results from over 360 auction houses from 27 counties. Lists "bought-ins" and transactions beginning at 100 USD.	Book: 109 USD per year
Falk's Print Price Index	Falk, P.H.	Auction prices: Prints	1991 - 1992	From 1993 on published together with Falk's Art Price Index.	Not available anymore.
FindArtInfo.com	http://www.findartinfo.com	Auction prices: Fine art	unknown	Over 1.1 million art prices of more than 47000 signatures and 290000 photos of artwork.	Online: free price information, detailed information for 69.95 USD per 6 months

Gabrius S.p.A.	http://www.gabrius.com	Auction prices: Fine arts	1985 - today	Lists transactions beginning at 1000 EUR. The data can be extended with books to begin in the 14th century.	Online: 990 EUR per year
Gordon's Photography Prices	Gordon's Art Reference Inc. http://www.gordonsart.com	Auction and dealer prices: Photographs	1970 - today	More than 145000 transactions from auction and dealers, bibliographic information and pictures also available.	CD, Online: 595 USD per year
Gordon's Print Prices	Gordon's Art Reference Inc. http://www.gordonsart.com	Auction and dealer prices: Prints	1978 - today	Best source for print price information. More than 675000 entries including prices of transaction, further text and pictures.	Book, CD, Online: 350, 595 EUR per year
Guide Mayer: International Auction Records	Mayer, H.	Auction and dealer prices: Fine arts	1963 - today	Over 120000 auction results to more than 50000 artists. Also artists with lower prices are listed. Was bought in 2001 by ARTVALUE SA and is available since then under http://www.artvalue.com.	Book: 80 EUR per year Since 2007 Online: Free of charge
Invaluable.com	http://www.invaluable.com	Auction prices: Antique and fine arts	15+ years in the past	Over 1000 auction houses with more than 20 million price results from over 5000 artists. Merged with Artfact Inc. in 2007.	Online 950 UKP per year

Kunstmarkt.com	http://www.kunstmarkt.com	Information: News, artists, auctions and galleries		This German portal is a mixture of journalistic information of the art market and database on artists, auctions and galleries. It seems to focus on the secondary market.	
Kunstpreisjahrbuch	Diverse (Weltkunst Verlag)	Auction prices: Fine arts, furniture, manuscripts, coins, icons	1978/79 - today	Focus on German market but containing 15000-20000 transactions per year, partly with texts and pictures.	Book: 125 EUR per year
Lawrence's Dealer Print Prices	Gordon's Art Reference Inc. http://www.gordonsart.com	Dealer prices: Prints	1992 - today	Over 250000 prices of art dealers.	CD, Online: 595 USD per year
Leonard's Index of Art Auctions	Theran, S.	Auction prices: Fine arts	1980 - 1998	American artists sold in America. Very good for unknown artists because all prices are covered. Partly continued for Latin American Art.	Book: 245 USD per year
Mageda	http://www.mageda.de	Auction prices: Fine arts	unknown	Over 103000 transactions with prices, text and pictures of over 18000 artists. Limited to 40 auction houses from the German speaking area.	Online: 710 EUR per year
Nagel's Art Price Index	http://www.auction.de	Auction prices: Asian and modern fine art, furniture	unknown	25 categories with over 25000 auction results of the Stuttgart based auction house.	Free of charge

Photographic Art Market Auction Prices	Persky, R.S	Auction prices: Photographs	1980 - today	Only auctions of Sotheby's, Christie's, Swann Galleries and Butterfield & Butterfield are registered.	Book: 70 USD per year
Proarte	http://www.proarte.at	Auction prices: Fine arts	1975 - today	More than 365000 transactions of over 40000 artists. Mainly data of "Dorotheum Wien" and "Wiener Kunstauktionen". Since 1996 partly extended to Germany, Czech, Switzerland and Hungary.	CD, Online: 150, 100 EUR per year
Reitlinger's Economies of Taste	Reitlinger, G.	Auction and dealer prices: Fine arts	17th century - 1960	Compilation of price data in three volumes. Partly selected data by the author's taste.	Book: 100 USD
RLG's Art and Rare Book Sales Catalogs Database	http://www.rlg.org	Auction prices: Fine arts and books	1599 - today	More than 894000 entries of Northern American and European auction houses. The data is assembled by public institutions.	Online: 1000 searches for 890 USD
the-artists.org	http://www.the-artists.org	Information: Modern and contemporary artists and works, art movements		Up to 6000 major modern and contemporary visual artists with portrait, brief biography, links to articles, essays and artist interviews. Also art movements are described.	

World Collectors Annuary	Diverse	Auction prices: Fins arts	1946 - 1994	Limited number of auction houses. Special data e.g. about Israel, Russia or Sweden available. Season lasts from June until July.	Book: 175 USD per year
World Wide Arts Ressources	http://www.wwar.com	Information: Artists and gallery portfolios, art movements, biographies and artwork		"The largest site for contemporary art, art news, art history, contemporary artist and gallery portfolios, online since 1995." Belongs to http://www.absolutearts.com.	