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Investments in Painting: The interaction of monetary return and psychic income

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INVESTMENTS IN PAINTING:
The interaction of monetary return and psychic income

Prepared by M.M.G. Fase

University of Amsterdam

Société Universitaire Européenne de Recherches Financières
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CIP

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M.M.G. Fase
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FOREWORD

The financial press gives very regular attention to art and culture in their many forms. Business newspapers such as the *Financial Times,* the *Wall Street Journal, Het Financieele Dagblad* and *De Financieel Economische Tijd* give over plenty of space in their weekend editions to news of art auction prices and exhibitions of major or less well-known works. As well as this practical outlook, more theoretical economists have given increasing attention to the economics of art since the 1970s. There has been a remarkably large amount of research into the pricing of art and the closely associated subject of the return on purchases of art. This centres on painting in general and on individual painters.

The attention to painting in the business press is without doubt prompted by the need for journalistic variety, plus the wish to impart a cultural element to the reporting. The provision of market information to readers is, of course, another significant motive. It is less simple to explain the academic interest of economists. At first sight, it seems exotic. But that is a hasty conclusion. Along with intellectual curiosity, there is probably a role for the need to apply trusted analytical methods to new areas of research. Whatever the reason, there is a place for the systematic study of the literature on the sense and nonsense of investing in painting and this is the objective of this paper. It is, however, also a report of explorations in a field that has fascinated me personally as an economist for many years. I, therefore, wrote this essay with great pleasure and hope I can share my enjoyment with my readers in the same way that guidebooks can sometimes add to the pleasure of a trip. Finally, I would like to thank Ms M. Brouwer, Ms A.E.M. Fase-Franse,

Mr C.K. Folkertsma, Mr S.G.A. Kaatee, Ms C. van Renselaar and Mr P.J.G. Vlaar for their discerning remarks and critical comments on earlier versions. I have made good use of them and believe that my essay is the better for them.

M.M.G. Fase

The author

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Contents

1 INTRODUCTION 7
- 1.1 A historical illustration from the art world 8
- 1.2 Practice in the international art trade 10

2 INVESTMENT THEORY IN BRIEF 13
- 2.1 Some basic principles of portfolio theory 13
- 2.2 Behavioural finance as an alternative approach 14
- 2.3 Art as an element of an investment portfolio 16

3 THE MARKET FOR PAINTINGS 19
- 3.1 The nature of the art market 19
- 3.2 Size of the art trade 20

4 THE PRICE OF PAINTINGS 23
- 4.1 Auction prices 23
- 4.2 A price index for art 24
- 4.3 Example of a price index for nineteenth-century paintings 31

5 ART AS INVESTMENT 35
- 5.1 Actual return on painting in general 35
- 5.2 The return on specific movements or painters 39
- 5.3 Return on investments in antiques and other collectibles 43
- 5.4 Once again, the return on specific painters 44

6 RATES OF RETURN CONSIDERED MORE CLOSELY 49
- 6.1 The monetary yield on art and the market rate of interest 49
- 6.2 The market for paintings as a segment of the international capital market 53

7 IN CONCLUSION SOME POLICY IMPLICATIONS 57

LITERATURE 61

ANNEX I 69

ANNEX II 71

INVESTMENTS IN PAINTING:
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M.M.G. Fase

1. Introduction

Art comes in different types and sizes and there is certainly no agreement on exactly what can be called art. There is, however, agreement on the links between art and economics, even if the overlaps are as varied as the rich gradations in artistic expression. History offers an almost endless list of illustrative and concrete examples. The literature pays great attention to these links in an often deep and varied way, at a more abstract level. A pertinent illustration of this approach, sometimes regarded as economic imperialism, is offered by the academic *Journal of Cultural Economics*. This quarterly journal, which will be drawn on from time to time in this study, has appeared since 1976 and covers an astonishingly wide range of subjects with economic consideration as a common central theme. This economic approach is the vital fulcrum and, to quote Robbins (1932), covers the allocation of scarce resources with alternative uses. In terminology frequently used in the past, this is the key, in which the choice is on spending income and allocating of wealth to various types of investment. The specific subjects considered – the empirical object so to speak - run from the acquisition of works of art or art sponsorship to measuring the success of exhibitions, policy for subsidising the performing arts and the economic desirability of the dissemination of culture. Pioneers in this field of the economics of art such as Galbraith (1960, chapter 3), Wagenführ (1965), Baumol & Bowen (1966) and more recently Frey (2000) have always taken a broad economic approach, studying the many facets of artistic expression in society. Baumol & Bowen also point out the economic dilemma of the sluggish development of productivity in the service sector and also, therefore, in the performing arts, and the consequences for the remuneration structure. This Baumol hypothesis finds empirical support in the Netherlands (Fase & Winder, 1999), as in a number of other countries, and explains the high price rises in parts of the cultural sector. The diversity of culture as perception and the associated role of money was excellently illuminated many years ago by Pen (1974), with particular attention to the role of the government. De Grauwe (1990) was more critical of that role in his plea for more market involvement in many forms of art. The

review of the literature, the *Culturele economie in de lage landen* (Cultural economics in the low countries), published recently by Van Puffelen (2000) under the auspices of the Amsterdamse Boekmanstichting provides a glimpse into the range of economic approaches to culture as a social phenomenon. His excellent and broadly oriented survey also illustrates the wide variety of approaches to this subject by economists and others. Much of this useful book is on the effectiveness of art subsidies. There is also consideration of the economic justification for government policy on the arts and the commercial aspects of, say, museum management. In addition, various types of art are examined from an economic viewpoint. Considerable attention is also given to, for example, the externalities of artistic expression and the maintenance of national art heritage as a social cultural good. Van Puffelen devotes three pages to the plastic arts, and only one of these is given over to art as an investment. This suggests that no inordinately great weight is given to investment in art as a subject of attention within cultural economics in the Dutch-speaking area. Nevertheless, consideration of the investment aspect of art is the subject of this essay. The choice of subject was not prompted so much by the belief that art can and should be seen primarily as an investment. This, as will be shown, is only a part of the case, as equal consideration is possible for art as a good to be enjoyed and used. More important than this question which goes beyond semantics is the belief that such an approach can serve to demonstrate the strength and relative quality of economic analysis and to show the scope of the subject and richness of interpretative opportunities. The similarity between an acquisition of pictures and a decision for more schooling is clear, in that schooling is seen as an investment in human capital. Often the enjoyment from studying prevails over the return to be achieved. Nevertheless, there have often been calls for a computation of the return from schooling and this has now become both accepted and carried out in practice many times.[1] Indisputably, consumption and investment merge here. This is no different for painting and this hazy boundary will be kept in mind below.

1.1 A historical illustration from the art world

A fascinating illustration of this view of investment and the necessary abstraction or narrowing of approach is offered by the story of the fate of Van Gogh's oil painting 'Portrait of Dr Gachet'. This picture was sold for USD 82.5 million at an auction at Christie's in New York on 15 May 1990. This not

[1] An example of an early plea is Drees (1966); Fase (1969, pp. 70-82; 1971) offers a substantive and similarly early computation of return on schooling for the Netherlands.

only set a monetary record in the art trade which has not yet been equalled, but also exceeded the old record of USD 53.5 million paid for Van Gogh's 'Irises' in 1987 by almost USD 30 million. Turnover at art auctions has been impressive since the 1980s, and this is not entirely unrelated to the boom in prices for modern art in those years, and appears to be a perfect reflection of trading on stock exchanges throughout the world. The pictures, sculptures, antique clocks, early porcelain, decorative objects and suchlike regularly auctioned by rival international houses Christie's and Sotheby's have been seeing often unprecedented prices. To illustrate this, Christie's turnover in the first half of 2000 was some USD 1.2 billion which was an increase of almost 20% over the same period a year earlier. The highest amount paid in this period for an individual oil painting was about USD 30 million for Picasso's 'Nature morte aux tulipes'. Although this is still a substantial price which is several times higher than the auction prices for seventeenth-century pieces, prices in 2000 (up to November) bear no comparison with the vast figures paid in the early 1990s for the Portrait of Dr Gachet, canvases by Pissaro, Renoir and other impressionists or for other late nineteenth-century modern art. Picasso's 'Femme aux bras croisés', a portrait from his 'blue period', set a new record of USD 55 million at Christie's auction in New York in November 2000. The opening bid, however, was only USD 15 million and, like Van Gogh's 'Dr Gachet' ten years earlier, this Picasso became the most expensive picture of the year. This picture is fifth in the top ten most expensive works of art, behind Cézanne's 'Still life', which was sold for USD 60.5 million at Sotheby's in 1999 and ahead of Van Gogh's 'Irises' in 1987, discussed above. The list in Box 1 shows that five of the ten most expensive pictures ever auctioned up to the end of 2000 are Picassos.

Box 1 Top ten most expensive paintings, year end 2000

1. Vincent van Gogh, 'Portrait of Dr Gachet', Christie's, New York, 1990: USD 82.5 million.
2. Pierre-Auguste Renoir, 'Le Moulin de la Galette', Sotheby's, New York, 1990: USD 78.1 million.
3. Vincent van Gogh, 'Self-portrait', Christie's, New York, 1998: USD 71.5 million.
4. Paul Cézanne, 'Still life', Sotheby's, New York, 1999: USD 60.5 million.
5. Pablo Picasso, 'Femme aux bras croisés', Christie's, New York, 2000: USD 55 million.
6. Vincent van Gogh, 'Irises', Sotheby's, New York, 1987: USD 53.5 million.
7. Pablo Picasso, 'Les noces de Pierette', Paris, 1989: USD 51.9 million.
8. Pablo Picasso, 'Femme assise', Sotheby's, New York, 1999: USD 49.5 million.
9. Pablo Picasso, 'Le Rêve', Christie's, New York: USD 48.4 million.
10. Pablo Picasso, 'Self-portrait', Sotheby's, New York, 1989: USD 47.8 million.

Alberto Giacometti's bronze statue 'Grande femme debout I' also reached a record price of USD 14.3 million at the same auction at Christie's where the record price was bid for Picasso's 'Femme aux bras croisés'. This was also the highest price ever made by a sculpture in general. These prices, achieved in the year 2000, give the impression that the late 1980s boom in the art market is repeating itself. The most expensive Rubens ever auctioned raised USD 7.5 million in 1989. That same year, an auction record for an old master of USD 35.2 million was paid for Pontormo's 'Portrait of Cosimo de Medici'. It now hangs in the Getty Museum. The conclusion, supported by similar examples for Rembrandts and other Dutch masters, is that the manifest shift in interest towards art of the first half of the twentieth century was without doubt at the expense of the old masters. The price of GBP 19.8 million (USD 28.7 million) paid at Christie's in London on 13 December 2000 for Rembrandt's 1633 'Portrait of an Elderly Woman,' from the Rothschild collection, is noteworthy in this respect. This too was an auction record for a portrait by Rembrandt and a major transaction for the Maastricht art dealer, R. Noortman.[2] However, and this supports the above conclusion, this dealer regarded his purchase as a relative bargain compared with impressionists and modernists of the second tier.

1.2 Practice in the international art trade

As noted above, the history of Van Gogh's 'Dr Gachet' is well documented and different aspects have been mapped out by art historian C. Saltzmann (1998). Her book not only reads like a detective story, but above all gives a case study of how richly faceted the consideration of a work of art can be, even with its repeated sales being at the heart of this excellent monograph. We learn that the first purchaser of the Gachet portrait, the Danish collector Alice Ruben, acquired the canvas through a Parisian art dealer, Amroise Vollard, in 1897 for FRF 300, about USD 58 at the time. Had she kept the portrait of Gachet for 93 years, the proceeds from the auction on 15 May 1990 of USD 82.5 million would have represented an average return of 16.5% a year. This idea is of course as imaginary as it is speculative. The portrait did not stay in the same hands but changed owners more than once, sometimes for respectable reasons but also under less pleasant circumstances. According to Saltzmann, the owners after Ruben were, in order: the Danish doctor Mogens Ballin, art dealer Paul Cassirer of Berlin, Harry Kessler[3] the collector and museum director in Weimar and, after

[2] See *Het Financieele Dagblad*, 23 December 2000, 28.

[3] See the excellent biography of H. Kessler by Grupp (1995) for details of this multi-faceted man and his cultural significance in compiling a German national art collection in the first decades of the 20th century.

he sold it through the Eugène Druet gallery, the city of Frankfurt. The latter purchase was made possible by the generosity of the wealthy Jewish banker and art lover Georg Swarenski of that city. The portrait would remain there for over 25 years until it was confiscated as degenerated art by the Nazis in 1937. The Jewish banker, Franz Koenigs, who had fled Germany to Amsterdam, acquired the portrait of Gachet through Nazi boss Hermann Göring and his artistic friends. He used the painting as collateral for a loan from the banker Siegfried Kramersky, who had also emigrated from Germany to the Netherlands. When the Kramersky family left the Netherlands in the spring of 1941 to set up in New York, they took much of their collection, including the Gachet portrait, to the United States. It was to remain there for almost half a century and was exhibited in public museums until the sale in 1990. The auction in 1990 was on the instructions of the Kramersky family, who had owned it since 1938 but who needed funds for the care of Kramersky's now elderly widow. After their flight from Amsterdam in 1941, the Kramerskys lent the canvas to the Metropolitan Museum of Art in New York. This gave their private property the nature of a quasi-public good. The purchaser in 1990 was a Japanese paper magnate, Ryoei Saito. The United States gained dollars in 1990, but lost a significant cultural item. This was perhaps also an unintended result of the unforeseen fickleness of the art markets in the United States and Europe in the days when great private wealth and a passion for collecting went arm in arm. In any event, it resulted in unexpectedly high market prices.

There is no doubt that a sample size of one, such as the price history of Dr Gachet's portrait, is entirely inadequate statistically to measure the return on art. The same applies for the example of Isaac Israëls' 'Mannequin in front of a full-length mirror', which was auctioned at Sotheby's in Amsterdam in 1980 for NLG 20,000 and then fetched NLG 816,000 in 1999.[4] The seller of the Mannequin thus enjoyed an annual average return of over 20%. Again, this is a chance illustration. The returns of 16.5% and 20% in these cases, therefore, merely serve as examples, with no general application. Nevertheless, they are worth noting, as very few portraits or other pictures have a detailed history in which successive owners and the amounts they paid are known. And this is especially the case with Van Gogh's Dr Gachet. Such an example also offers an exciting story of money, impassioned purchasing and artists. It is possible though to pose the question of the return on pictures and to make it specific by looking at certain art-historical movements in painting. This gives an idea of the return on paintings. In addition, greater detailing provides insight into its economic significance. This is, as noted above, the subject of this essay.

[4] See Loonstra & Partners, Nieuwsbrief No. 16 (December 1999, 2).

2 Investment theory in brief

2.1 Some basic principles of portfolio theory

It is said that the Rothschilds always divided their assets into three equal parts to invest in securities, property and jewellery, art, cash and other assets. In his history of the Rothschild banking house over two centuries, Ferguson (1998, 3) reports this anecdote on the Rothschilds' investment strategy along with other apocryphal stories of their wealth with a comment that he could not vouch for its historical accuracy, as there is no trace of this story in the Rothschild archives. He does note that the Rothschilds were ardent coin and art collectors, certainly in their first hundred years as bankers, partly because they regarded these items as a solid form of wealth. The Rothschilds' investment philosophy at the time was probably based on a mixture of common sense, business instinct and financial insight, best expressed in the popular saying that you should not put all your eggs in the same basket. This viewpoint is reflected in the doctrines of portfolio decisions in modern monetary theory and corporate finance.[5]

The heart of modern portfolio theory is the assumption that an investor is aiming for maximum utility from the bouquet of assets which together form his wealth, with rational expectations for the income from the individual components. This maximisation is subject to the limitation that all the assets will be invested at the best possible income and risk ratio. Wealth consists of identifiable elements which all have a price, in which all facets of financial and other assets are clearly visible. The main ones are market uncertainty and the degree of liquidity in comparison with competing assets. The decisive limitation is, of course, the amount of wealth. The above formulation of the problem of deciding on an optimum investment portfolio is in fact a mathematical problem of optimisation subject to uncertainty. The result is never a surprise, as this approach gives a somewhat distorted reflection of the earlier assumptions. This abstract presentation does form an intellectual basis for the often intuitive investment approach as used for example, by the

[5] See e.g. Ingersoll (1988, chapters 2 and 3), Blanchard & Fischer (1989), Duffhues (2000) and also Hicks (1967) and Mishkin (1995, chapter 4). Mishkin makes do with an informal but accessible explanation. A predominantly policy-oriented monetary-theory approach is given in Walsh (1999, chapter 2). Following Mishkin and for brevity, we limit ourselves to a fairly informal outline of this theory. For a more comprehensive treatment see the other cited text-books.

Rothschilds and clarifies the fundamental significance of the roles of risk and uncertainty and, therefore, of expectations when composing an investment portfolio. In a classical portfolio model, the allocation of wealth to the different assets depends entirely on the expected relative return on the assets, which is also reflected in the degree of liquidity. If we choose a dynamic presentation, expected income, the degree of risk and the extent of risk aversion become explanatory factors along with the determining factors already found in the static framework. As soon as uncertainty and risk are taken into consideration, the assumed distribution of the stochastic rates of return on the various assets and their association – the statistician refers to covariance – play a role. These partly influence the nature of the portfolio decisions, while often the assumption of rational expectations introduces an element of elegance but practical intangibility.[6] Greater uncertainty, measured by the distribution of the returns on each of the assets, will generally increase the return required by the investor. Risk aversion can either mitigate or boost this. Concrete analysis of this requires a particular functional form of the utility function used in the investment portfolio, as it is no longer enough to use the very general formulation which, for didactic reasons, most textbooks prefer in their explanations. Furthermore, experience shows that the choice of, say, a formulation which departs slightly from the usual specification of the utility function, or abandoning the common assumption that income from the investments is immediately reinvested, rapidly results in complex solutions.[7] We will make do with this comment for the sake of theoretical perspective. For my purposes, practical simplicity is, however, enough. The example given in the introduction of a computed return of 16.5% to the owner of 'Dr Gachet', however, implicitly assumes the fiction that there was no change in legal ownership. As Saltzmann's story illustrates, this was not the case, but the continuous changes in owner can be seen as a type of art leasing.

2.2 Behavioural finance as an alternative approach

Portfolio theory and rational expectations are closely linked and neither is uncontested. In any event the two are reflected in the assumed price formation. The assumption is that a price incorporates all relevant market information as, otherwise, opportunities for profit would be unused, and that

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6. In my inaugural lecture in Rotterdam in 1981, I discussed this critically but favourably and I pointed out the danger of 'measurement without theory' when operationalisation is tested. This opinion is reprinted in Fase (1999a, chapter 2, pp. 25-43).

7. Fase (1999b) shows the implications of abandoning what is, for the freedom of spending by the investor, a very limiting assumption by considering nested utility functions for portfolio composition and investment proceeds per period, respectively.

is not rational. Consequently, all opportunities for arbitrage are used. Such a market is described as efficient. An efficient market is the expression of rational investment behaviour in the context of portfolio theory, as outlined above. This approach is currently the dominant paradigm in investment theory. According to efficient market theory, share and bond prices, and the prices of other assets, including pictures, reflect all market information and there is no place for individual market sentiment. Efficient market theory does not have sufficient empirical support, however, and so its general applicability has attracted doubt from all sides in recent literature. Many factual studies, often performed with much statistical ingenuity, further undermine this ideal image of the capital market. This deviation or anomaly demands an explanation and also requires an alternative view of investor behaviour. It demands a different theoretical angle from the efficient market approach and portfolio theory. A fruitful alternative, put forward here for that reason, is the behavioural finance hypothesis. This is attracting increasing attention in the literature. The behavioural finance approach has provoked a stream of empirical research which is paying particular attention to the equities market.[8] There are, however, enough reasons to widen the attention to the entire capital market, including that for painting.

An important element in behavioural finance theory is that investors can think differently about market developments and thus about the expected return on the investment of their choice. Unlike the classical portfolio allocation model with rational expectations, the behavioural finance approach recognises the possibility of active investment behaviour. The underlying thought is that the observed facts and available information can lead to more than one reasonable explanation and, therefore, theory. In the behavioural finance approach, the trading arising from such an interpretation of the facts also leads to a market equilibrium. Consequently, there is no single universal portfolio investment model, as postulated by the classical portfolio approach, where expected yields are the guiding factor. In other words, there is room for alternative investment strategies and the one selected is determined mainly by the rationalised feelings of the investor. This distinguishes win and lose situations, market reinforcing or weakening reactions by the investor, which are partly prompted by changing interpretations of the actual market. In short, market sentiment, fed by information and the investor's know-how, plays

8. See for example, Barberis, Shleifer & Vishny (1998); Daniel, Hirschleifer & Subrahmanyam (1998), De Bondt & Thaler (1985, 1987). Shleifer (2000) gives a good overview. Kemna (1995) and Vriezen (1996), to name just two, clearly illustrate the use of this approach in the development of a practical investment strategy. An interesting attempt to test the approach of De Bondt & Thaler against Dutch data is given in Jacobsen (1997, chapter 3).

a major role in the formation of price expectations and the actual investment behaviour relies on this in accordance with the behavioural finance approach. This opens opportunities for integrating the technical analysis popular with financial analysts into a theoretical behavioural framework with useable forecast methods – mean reversion, mental accounting and trending patterns – as practical investment strategy. Unmistakably, the behavioural finance approach is an attractive model for investment in painting. It allows for personal preferences and feelings and this seems to make it more realistic than the portfolio allocation model based on rational expectations and market efficiency. In the behavioural finance approach, the flesh and blood is, as it were, returned to the market. The clinical *homo economicus* of the elegant and rational expectations hypothesis rich *in abstracto* steps back in favour of a market of practical reality, where sentiments are also important. The market for painting is undeniably part of this. Consequently, the behavioural finance model offers a credible basis for explaining investment in painting and the large price fluctuations in the associated markets during the past decade.

2.3 Art as an element of an investment portfolio

According to the line of though presented by the portfolio investment theories as outlined above, owning works of art is regarded as just one of many ways of holding wealth. Art then becomes an object of investment. The economic literature occasionally follows this approach, as for example the works of Czujack et al. (1996) and Flôres et al. (1999) illustrate. Naturally, such an investment is made in addition to other types of investing. This means that the various candidates for the investment portfolio are weighed up in terms of income, with uncertainty and taste also playing a role. In theory, the latter occurs entirely in the choice of the assumed utility function and its characteristics. In contrast, uncertainty with respect to the expected returns and their interdependence follows entirely from the assumed probability structure of investment income. In that connection, the literature often distinguishes between systematic and non-systematic risk. The latter contributes a unique character, a feature of which is that it bears no relationship to the expected rates of return on the other assets. This is a way of reducing the risk through portfolio diversification. In investment practice, this latter is expressed by the saying ‘don’t put all your eggs in the same basket’.

Nevertheless, it can be asked whether art is entirely comparable with financial assets such as shares and bonds as part of an investment portfolio. Unlike them, works of art also have an intrinsic value. The owner derives a certain

utility or psychic income from the object. There is a similarity with house ownership and schooling, discussed below and above respectively. A house, for instance, is both an investment and a functional good which provides accommodation to the owner-occupier. These services and the associated utility jointly determine the attractiveness of the investment, which, therefore, does not depend exclusively on the expected monetary return. It is the same with a painting. Consequently, the similarities between the financial markets on the one hand and the housing market or the market for painting on the other are limited. This takes nothing away from the fact that art being regarded as part of the investment portfolio is functional and enlightening.

A completely different facet is the nature of the market. In investment theory, the assumption of an efficient market is dominant. This assumes that all relevant information is built into the price as a result of the free play of market forces. This is the case in particular for well-organised markets for financial investments with many participants, as confirmed by extensive empirical research.[9] However, for other assets such as real estate, land or paintings, with less liquid markets, it is appropriate to ask whether the efficient market hypothesis is not above all merely an heroic assumption with hardly any value in reality. The behavioural finance theory approach meets this objection and seems to fit the market for paintings. This alone is reason enough to look at this alternative investment approach in corporate finance theory, partly in the light of the nature of the market for paintings and other collectibles. In any event, it does justice to the typical features of these markets – and those for housing – in comparison with the financial markets in general, as the distinction between consumption and investment goods such as pictures and houses is not sharp.

[9] Campbell, Lo & MacKinlay (1997) provide a good theoretical and empirical overview for this.

3 The market for paintings

3.1 The nature of the art market

The huge price rises in the market for paintings in the 1980s with the arrival of wealthy Japanese art collectors on the auction circuit – in fact a repeat of what had happened a century earlier in the United States – provoked many protests. These originated from the fear of the supposed effect on prices. In that context, a new term, '*commodification'* of art, was coined. This neologism was used by Saltzmann (1998, p. 315) and others. The noteworthy feature of this is that it highlights the fact that the market for art is special. This feature lurks of course to some extent in the nature of the traded objects which, as the use of the word commodification suggests, is slowly becoming commercialised. The arrival of new purchasers from outside the traditional circle of collectors reduces the emotional link between the object and owner and replaces it with a predominantly rational one. This probably affects market behaviour.

The art market – like, in some respects, the market for existing houses or gold – differs from most other commodity or financial markets by the fixed supply. This is mainly a consequence of the fact that the goods traded on the art market cannot be reproduced. Furthermore, the market for paintings from the past is a secondary market. Pictures and drawings are always unique. In terms of demand and supply, this means that supply (except for contemporary art) is fixed and that the price of a work of art is dominated entirely by demand. According to Marshall's well-known classification (1890, p. 410-411), there is – to use De Jong's terminology (1965, p. 270) – an ultra-short market period.[10] In other words, the quantity of goods on offer is limited upwards and cannot be expanded in the short term. Supply can, however, fall if suppliers take products off the market, or because works of art become immobile if they end up in museums which cannot or do not want to offer their possessions for sale.

With respect to the nature of the market, and this certainly applies to paintings, there is an imperfect market where supply is not homogeneous. This does not mean that there is no substitution possible between pictures. As in day-to-day life, one can choose between apples and pears or different types

[10] See also Delfgaauw (1965, p. 206), who gives preference to the, in his and my opinion more precise but less attractive, term 'infra-short period'.

of financial asset on the basis of their properties and price inter-relationships, and this also applies to the purchase of works of art. If two pictures are offered for sale and both offer the combination of specific qualities desired by the collector, price often determines the decision to buy.

3.2 Size of the art trade

Compared with the markets for shares or bonds, the art market is not only opaque but also small in size and, therefore, not very liquid. The best proof of this is provided by comparing the turnover of auction houses for art with that of the stock exchanges. In 1989, at the then peak of the market, the combined turnover of auction houses worldwide was almost GBP 3 billion. In 1993 this had fallen, possibly as a result of the poorer economic climate after 1989, to just over GBP 800 million. Art auction turnover in the Netherlands in 1992 was less than GBP 15 million. These figures only cover part of the market. Sales figures for the overall art market are not known for every year. According to the Art Sales Index databank (ASI databank), worldwide turnover on the international art market in the 1996/97 season as recorded by the major auction houses was GBP 1.2 billion or over USD 2 billion, with turnover of over GBP 25 million in the Netherlands. The Netherlands, with a market share of 2%, occupies a modest place compared with the United States or the United Kingdom, which have shares of over 47% and almost 29% respectively.

Table 1: Geographical distribution of turnover in international art auctions

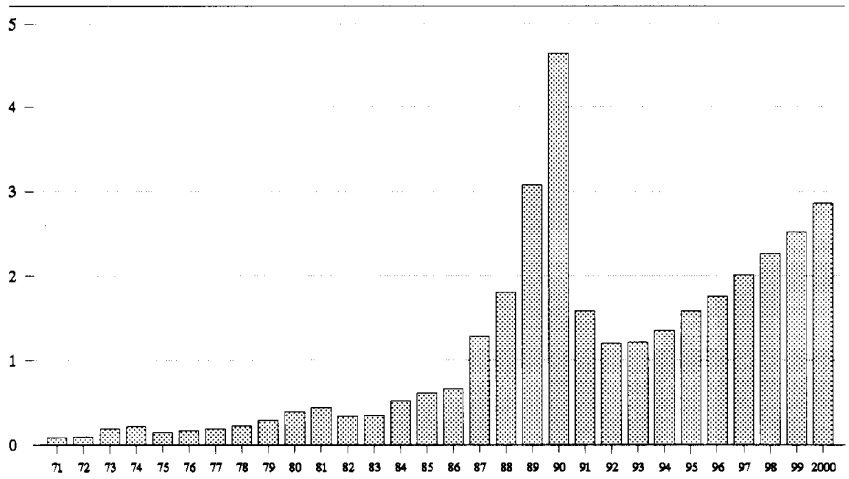
Country	Turnover (x GBP million)	Percentage share	Number of lots
Australia	14. 2	1. 2	2,954
Germany	40. 6	3. 3	10,709
France	70. 2	5. 7	13,532
Italy	24. 3	2. 0	4,252
The Netherlands	25. 3	2. 0	5,098
Austria	19. 9	1. 6	3,876
United Kingdom	352. 4	28. 5	32,852
United States	582. 6	47. 2	22,158
Sweden	18. 5	1. 5	4,976
Switzerland	22. 9	1. 9	4 ,176
Other countries	63. 4	5. 1	17,139
Total	1,234. 3	100	121,722

Note: relates to the 1996/97 season according to information from Art Sales Index Ltd., London. Converted into dollars, the total turnover was USD 2,018.9 million.

The market in the Netherlands is comparable in size with those of Italy and Switzerland, but significantly smaller than those of Germany and France. Table 1 gives details of turnover in the auction market (see also Annex I), which is mainly a wholesale market. In addition there is private trade, which has a more local nature.

There are also local traders, however, who work for an international public (see for example, the interview with art dealer Robert Noortman in *NRC-Handelsblad*, Cultureel Supplement, 24 November 2000). However, little statistical material has been compiled on the size of this market. The amount of the turnover for the period 1970-2000 is shown in Figure 1, which suggests that the good times of the 1980s appear to be coming back.

Figure 1: Total art auction turnover (paintings)
(x USD billion)



The relative size of the art trade is clearly illustrated by comparing it with turnover on the stock market, for example. In 1992, a year taken at random before the start of the later economic boom, the turnover on the Amsterdam stock market was almost NLG 450 billion, i.e. more than 10,000 times greater than the turnover on the Dutch market for paintings. The art market is, therefore, small when measured in monetary terms, despite the enormous prices sometimes paid. This view does not change if the number of participants on the art market is taken into consideration. The fact that certain artists have predominantly regional significance – for example, South America and Mexico or the United States, as studied by Ekelund, Ressler & Watson (1998; 2000) and Ginsburgh & Penders (1997) – impairs the creation

of a global market for paintings. Another aspect of the art market is that demand and supply are sometimes subject to government regulations which forbid the sale of national heritage abroad, and this creates a certain national segmentation. It is clear that such regulations hinder free price formation and the creation of a global market for paintings. This, therefore, is significantly different from price formation in other capital markets. The art market is, in global terms too, in all probability not an efficient market while, according to much research, the stock or bond markets are close to being efficient. Price formation is thus less certain and to a large extent subject to the whim of rapidly changing preferences. A good illustration of this is the displacement of old seventeenth-century masters by modern art in the final quarter of the nineteenth century and the renewed interest in Italian, Dutch and French seventeenth-century art. There are various hypotheses on the background to this. One of these is that the new world (especially the United States), with increasing wealth and purchasing power, felt the need to distance itself from centuries-old European court art with its elitist overtones. The new money in the United States focused on the artistic preference of the industrial *nouveaux riches* in the Europe of the nineteenth century. The collecting behaviour of, say, J.P. Morgan in the United States at the turn of the nineteenth to the twentieth century, but also that of the German Harry Count Kessler at about the same time offer a telling illustration.[11] Another hypothesis is that the major influence of new, often Jewish collectors who had a certain indifference to mainly Christian inspired art[12] perhaps occasioned a shift in demand in favour of modern art. According to this hypothesis the Van Goghs, Monets, Picassos and Renoirs, to name just a few examples, offered a welcome alternative, liberating the acquisition mania of these new collectors. The new participants in the market exercised their purchasing power and prices reflected this in full.

11. See footnote 2 and Strouse (1999).
12. See 'New century, old masters', *The Economist*, 29, July 2000, p. 88.

4 The price of paintings

4.1 Auction prices

Various ways have been tried to enhance transparency in the art market. A potential purchaser can make enquiries ahead of an auction about the estimated price of a piece. Furthermore, sale catalogues often list price estimates for the works of art. In addition, regular attendance at viewing days and auctions can build up insight into the market price structure, while lists of auction results appear after the sales. It is, however, difficult or impossible to discover prices in the art trade outside auctions and the expected prices of unsold auction items. In such cases, the market fails as a source of information.

There is much uncertainty in the art market on the quality of a work as well as the price. To start with there is the possibility of a fake. For example, there are more than 5,000 pictures by Corot in the United States alone even though Corot himself only painted 2,000 pictures.[13] A second risk is the chance of incorrect attribution. 'The man in the golden helmet' is now worth only a fraction of its original value, since the participants in the Rembrandt project regard it as wrongly attributed.[14] In this connection, provenance, in other words the 'family history' of a work of art, is vital for the purchaser and in fact indispensable in forming a sound opinion of the value of the work to be purchased. In addition, there is not a single price but many prices and these can vary widely between works. This too causes problems. The nineteenth-century Dutch statistician C.A. Verrijn Stuart noted that if there are many prices, there is insufficient clarity to build up a general picture. The presence of quality differences between the commodities under consideration makes it even more difficult,[15] and this also applies to the price of paintings.

The analogy between commodities, wine and painting is evident in terms of price formation and the resulting price, as shown by Ashenfelter's (1989) astute argument. Prices are formed in bilateral trade or at auctions. For paintings this is a carefully organised trading technique with quality

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[13] F. Arnau, s.a. See also the article by G. Telgenhof, 'De stier van Potter op maat gemaakt' in *NRC-Handelsblad* of 20 July 1994.

[14] NIBE, 1993.

[15] Verrijn Stuart (1915, p. 220).

assessments and some grouping of pieces into movements. This adds homogeneity to the supply and somewhat simplifies price formation. Price indications are often given, so that price formation gains in transparency and the market in efficiency. In short, in the words of Haccoû (1948, p. 443), the auction technique gives the art market an active fulfilment of duties, in which the market, in our case for pictures and related illustrations, gains in significance as a means of price formation.

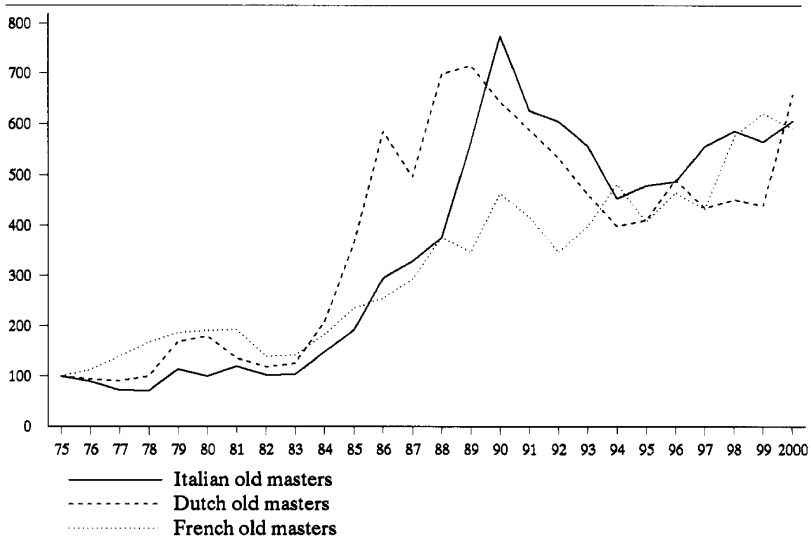
4.2 A price index for art

The basis for computing the monetary return on goods which are not physical capital goods or means of production is the movement in prices in the market for the good concerned. In paintings this is the price trend (according to Art Market Research in London). Figure 2 shows the trend in prices for French, Italian and Dutch old masters recorded at auction in London over the past 25 years, while Figure 3 shows the trend for three movements of modern or contemporary painters compared with old masters (for the assessment, Annex II lists the names customarily used for these movements, without claiming to be complete). As always in assessing a price trend and as noted by Verrijn Stuart (see above), it is advisable to have an index which reflects the idiosyncrasies of the art market. Indices come in various types and sizes and the search for the ideal price index has kept many economists and statisticians, and certainly not the least among them, busy.[16] In the literature and practice of the art trade, four methods of determining indices receive particular attention. Before moving to my own assessment, I briefly consider these four methods. They are the geometric price index method, the repeat sales regression index method, the hedonic price index and Sotheby's price index for art.

Geometric price index
It is assumed in computing the geometric mean price that the observed auction prices of individual pictures form a sample of the underlying probability distribution of picture prices. The price index of the entire collection which results from this geometric mean is based on this sample of actual auction prices. To allow comparison over time, the population from which the pictures to be auctioned have been taken must be stable and precisely defined. In practice, this condition is met by including only pictures

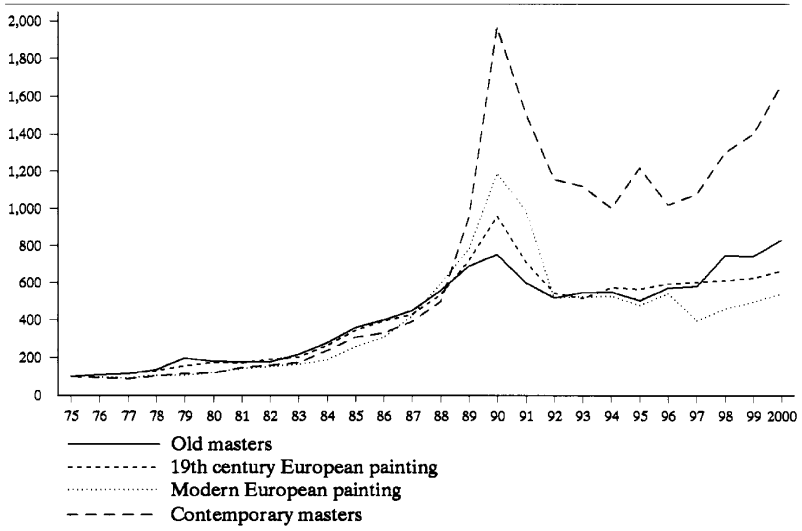
[16] E.g. Fisher (1922), Haberler (1927), Keynes (1930), Frisch (1936) and Kloek (1966). For a list see Stigler (1987) and Aldrich (1992). Fase & Mourik (1986) and Fase & Van Tol (1994) give examples of applications.

Figure 2: Price trends for three categories of old masters



Source: Robin Duthy and Art Market Research

Figure 3: Price trends for old masters and contemporary masters



Source: Robin Duthy and Art Market Research

in the population which were painted before a given period, and whose painters have died. The relationship between the geometric mean of individual prices in the sample and the base period is multiplied by one hundred to provide the price index. The choice of a geometric rather than an arithmetic or other mean is closely related to the objective of this price index which centres on percentage changes in the elements. There are also a number of other statistical considerations of a technical nature in this choice which we will not go into. The technical details of the geometric price index used here are summarised in Box 2.

Box 2 The geometric mean price index

The price index formula is:

$$P_t = \prod_{i=1}^{n} p_{it}^{1/n} / \prod_{i=1}^{n} p_{is}^{1/n}$$

where P_t is the composite price index, p_{it} and p_{is} are the prices for painting i at times t and s respectively, and n is the number of paintings considered, in other words the sample size. A geometric mean is normally used for computing a mean of ratios.

The logical basis for this price index formula is the following. Assume that the population consists of n pictures. If Dp_i/p_i is the mean for the monetary appreciation of painting i over the time period Δt between times s and t, the mean relative price rise is equal to:

$$P_t / P_s = \exp[1/n \sum_{i=1}^{n} (Dp_i / p_i)\Delta t]$$

Substitute D (ln p) for Dp_i/p_i and the above price index results at the limit. The relationship with Divisia's price index, described in F. Divisia (1928), is noteworthy and is also sometimes applied for the preparation of monetary aggregates across countries, as this avoids the conversion problem without creating distortion, as illustrated in e.g. Fase (1985, 2000a) or Fase & Schuit (1992) and Fase & Winder (1994). A significant application of the geometric price index for calculating returns on art is offered by Stein (1977). The index formula set out above can be summarised as a special case of a wider class of means.[17]

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[17] The various types of weighted means, such as arithmetic, geometric, quadratic, harmonic, etc. are all justified by the nature of the values observed which are averaged. They can be generalised into a single formula in which the economist recognises the so-called CES function. This is: $\psi = (\sum_{i=1}^{n} \alpha_i X_i^{-\rho})^{-\frac{1}{\rho}}$ where for example, for $\rho = 1$ ψ is an arithmetic mean and for $\rho \to 0$ ψ is a geometric mean where $\sum_{i=1}^{n} \alpha_i = 1$.

The advantage of using a geometric price index is that all auction data are used. A disadvantage of this method is that no distinction is drawn between different artistic movements. There is an implicit assumption in its computational method that the paintings auctioned are always of equal quality, but this assumption may not be realistic.

Price index using repeat sales regression

The Repeat Sales Regression (RSR) price index method was originally developed to measure the trend in property prices. The justification for this approach is mainly that the method allows for the heterogeneity of the objects – houses or paintings, for example – by taking account of their main differences. This permits a degree of standardisation of the price. When applied to painting, the RSR method uses the purchase and selling prices of individual paintings to estimate the change in value of a painting deemed to be average or representative for a given time period. In other words, only data for a painting which has been sold several times can be used, and so the price trend of the same picture is examined over the course of time. The approach is as follows. The logarithm of the price relationship is computed for each pair of sales, in other words the logarithm of the price made on the first sale. In ordinary language, this is roughly the percentage price change and using it, regression analysis is performed on a set of dummy variables, with a dummy variable for each sale. Box 3 gives further details of the RSR method.

Box 3 The Repeat Sales Regression (RSR) method

The regression equation is:

$$r_{itt'} = \sum_{j=1}^{T} b_j x_j + u_{itt'}$$

Where $r_{itt'}$ is the logarithm of the price relationship of painting i, on a first sale at time t and a final sale at time t', T is the number of observations, and x_j a dummy variable equal to 1 during the second sale and which otherwise has value 0. b_j is the value of the logarithmic price index in the period j and $u_{itt'}$ is a disturbance term. The logarithm of the opening value of the index, in other words b_0, is normalised at nil and is, therefore, the base of the price index. The following values of the logarithm of the price index are estimated by the regression coefficient b_j. This approach was frequently used in the literature on the return on art in the early years, e.g. Baumol (1986), Frey & Pommerehne (1989), Goetzmann (1993) and Pesando (1993). They also give the econometric details and refinements connected with this approach. Buelens & Ginsburgh (1993) consider the shortcomings and argue for the hedonic regression method as a useful alternative on both theoretical and practical grounds. In practical terms, the need for at least two sales is a serious limitation for the RSR method, as some of the available sample data remain unused and consequently the quality of the estimate is unnecessarily impaired.

The advantage of using the RSR method is that the increase in value of a single painting is measured which means that it is not necessary to adjust for quality differences between paintings. The disadvantage, as noted above, is that only a small part of the available selling data are used, so that any fluctuations in value between the two sales are hidden.

Price index using the hedonic regression method
In the hedonic regression method, adjustments are made for differences in a paintings quality, format, previous owner, etc. In any transaction the observable characteristics of a painting are for example the name of the artist, the measurements of the painting, the school it belongs to, a quality assessment, etc. The hedonic regression method estimates – entirely in the spirit of Lancaster's (1966) consumption theory – the implicit price of these characteristics, so that the characteristics of a painting can be converted into binary or dummy variables which explain the observed effective prices. The regression coefficients estimated in this way are the implicit or shadow prices of these characteristics. These shadow prices are then deducted from the effective price of the painting to create a harmonised market price. The annual averages of these variances give, as it were, the price of a 'standard' painting thus creating comparability in a proper way. A price index is computed from the resulting series of standard prices. The return is often obtained by isolating a type of trend term. This is the most commonly used method for determining the return on works of art. See Box 4 for the technical details of the statistical method behind this approach.

The advantage of the hedonic regression method is that all auction data are used, even if there are no repeat sales, and that in principle price trends can be identified for different artistic movements or schools. The main disadvantage of the hedonic regression method is that often only a few specific characteristics of a painting are known. Consequently, the actual application is poor compared with the high theoretical hopes. This is well illustrated in the research by Buelens & Ginsburgh cited in Box 4.

Sotheby's Art Index
Sotheby's Art Index covers antiques and paintings and was used until about 1995 by that auction house to provide market information and promote transparency in the art market. The paintings section covers four categories: old masters, nineteenth-century European painting, impressionists and modern art. The index for each of the four categories is compiled on the basis of a fixed group of objects. A basket of on average 30 to 40 pictures in each category was compiled in the base year 1975. They were selected on the basis

Box 4 The hedonic price index

In this approach, a commodity – in this case a painting – is usually regarded as a bundle of characteristics for which there are shadow prices. These prices together form the desired price index that results from a regression of the price of the object under consideration on the identified proxies for the characteristics. Examples of the latter are the reputation of a painter, the quality of a canvas, size, history, age of the canvas, etc.

The general formula for this method of making a price index is as follows:

$$\ln p_{k,t} = f(x_{1kt},...,x_{mkt},...x_{Mkt}) + g(t) + u_{kt}$$

where x_{mkt} is a measurable characteristic of picture k at time t, g(t) any function of time t and u_{kt} a stochastic term to allow for disturbance, for which the common assumptions from the multivariate regression model are made, as described in Goldberger (1964, pp. 201-212). A possible specification of the above general expression, often used in the related empirical research discussed below, is:

$$\ln p_{k,t} = \gamma + \beta t + \Sigma_i \alpha_i x_{i,kt} + u_{kt}$$

where, as above, $p_{k,t}$ is the price of painting k, sold in year t; $x_{i,kt}$ the i^{st} characteristic of painting k and u_{kt} the disturbance term. In this comparison the α_i's,β,γ are the coefficients to be estimated. The estimate of the coefficient β corresponds in this approach to the return per time unit. This method in the above regression formula is applied by Anderson (1974) and developed further by inter alia Buelens & Ginsburgh (1993) and tested in Generale Bank (1993). It was introduced earlier to determine the price index for houses and cars by Kain & Quigley (1970), Griliches (1971) and Cramer & Kroonenberg (1974), respectively.

of good quality in the mid-section of the market as, according to Sotheby's, that segment best reflects price movements in the market.

Using prices made at Sotheby's auctions for comparable works, Sotheby's art experts revalued the paintings in the basket when an event with a marked effect on the market price (such as an auction, an important exhibition or a publication) occurred. Sotheby's price index is what price index literature calls an unweighted linear composite price index based on a fixed selection of objects. This index is a Laspeyres price index. Box 5 sets out the details.

The advantage of Sotheby's Art Index is that it is no longer necessary to adjust for the difference in quality between the paintings, as price trends are always applied to the same and, therefore, homogeneous works of art. A distinction is also drawn between the different artistic movements. The disadvantage of this method is that the prices are based exclusively on a subjective valuation by experts that is not necessarily in line with the market price on a real sale.

Partly for this reason, Sotheby's index was recently abandoned and replaced by a new index developed by Art Market Research Ltd. This will be discussed later in this essay.

Box 5 Sotheby's price index for certain movements in painting

The price index P_j is a simple arithmetic mean of prices in the current and base period for movement j in the art of painting defined by art historians. As a formula:

$$P_j = \sum_{i=1}^{n} p_{i,1}^{j} / \sum_{i=1}^{n} p_{i,0}^{j}$$

where P_j is the price index for movement j; $P_{i,1}^{j}$ and $P_{i,0}^{j}$ the price of painting i in the current and base periods respectively for movement j; n is the number of works in the basket for movement j under consideration. There is a close relationship with the well-known Laspeyres price index.

Evaluation of the four methods

It is possible to evaluate the suitability of indices both formally and on substantive grounds. Following Irving Fisher, the formal assessment is used mainly in theoretical analyses.[18] Preference below is based on a substantive assessment of the indices for paintings discussed above. Three qualities appear to be significant: the extent to which the index is computed from actual selling prices, the breakdown into artistic movements, and the extent to which differences in quality between the various paintings are allowed for. It is clear that the four methods discussed above do justice to these qualities in different measure. The geometric price index and the hedonic regression approach use actual auction prices. This is not the case with the RSR method and Sotheby's Art Index. Only the hedonic regression method and Sotheby's Art Index distinguish between artistic movements. Quality characteristics are expressly used in the RSR index and Sotheby's Art Index and in fact only to a small extent in the hedonic regression method. Taking all this into account, it has to be concluded that none of the indices discussed meets all the desired properties. Sotheby's Art Index is satisfactory in many respects but its main shortcoming is that it does not use actual auction prices. In order to overcome this significant disadvantage, I developed my own index in the spirit of the Sotheby's Art Index applying the latter's method but using actual auction prices and focusing in particular on nineteenth-century paintings. This is an important movement providing much trade for auction houses. The Art-1000 index of Art Market Research, referred to above, which was introduced in 1996, is very similar to my variant.

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[18] See the literature in note 6, in particular Fisher (1922), which in my opinion is still the foundation of a practical approach to indices.

4.3 Example of a price index for nineteenth-century paintings

Attention for European nineteenth-century painting shows an interesting trend which is reflected in prices. At the beginning of the twentieth century, the genre attracted large but changeable interest. Scots industrialists for example, were prepared to pay considerable amounts for a painting by Jozef Israëls or Jacob Maris. In 1910 for example, Maris' 'Access to the Zuider Zee' fetched GBP 3,150. In 1924, it was sold in auction for GBP 2,887 but eight years later, in 1932, the same picture raised only GBP 75. The public had clearly lost its interest in paintings from this period. In recent years, European nineteenth-century paintings have, however, enjoyed renewed interest from art buyers. Gustave Courbet's 'Flowers on a Bench' was sold in New York in 1992 for millions of dollars, being a record price for this painter.[19]

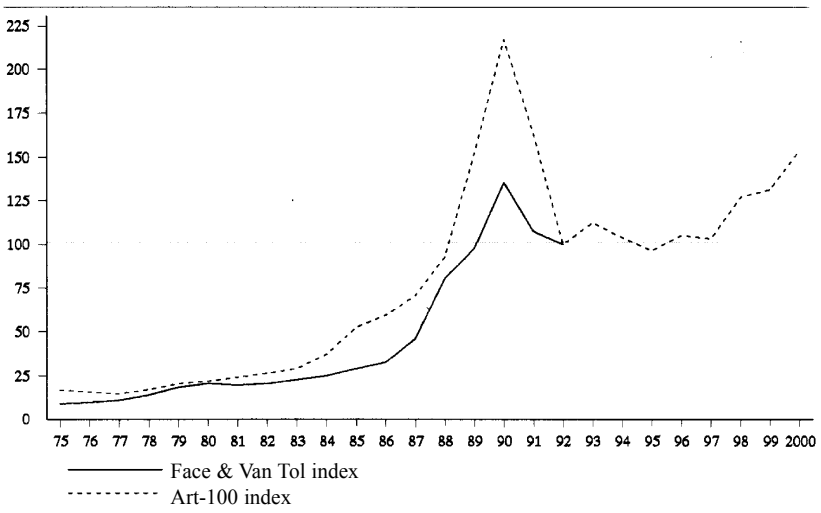
To illustrate this price trend in more general terms, Fase & Van Tol (1994) designed a price index for the period 1972-92 for nineteenth-century paintings. It used actual auction prices in pounds sterling made in London. As noted above, my index was based on Sotheby's Art Index and – as is the norm for composite indices – uses a basket. In order to use all available auction price data, the idea of a fixed basket of pictures from Sotheby's Art Index was replaced by a basket of a fixed group of artists (compare the analogy of replacing indices based on RSR with hedonic index series). This covered 61 artists – including C. Springer, I.B.C. Corot, Von Wierus Kowalski and G.H. Breitner – which Sotheby's regarded as representative for the mid-segment of the market in 1975. The thought behind this choice of a fixed group of artists is that this largely excludes differences in quality. There are two stages in the computation of the index. First, a price index was computed for each artist and these individual indices were used to compile an index of nineteenth-century European paintings. Extremely high or low auction prices were identified on the basis of the standard deviation as statistical outliers and excluded from the computation of the index. The result of the computation for the period 1972-92 is summarised in Table 2 and shown in Figure 4. That chart shows that up to 1990 there was an upward trend in prices on the international market for paintings. The highest prices were achieved at the peak in 1989, as shown by the other line, extended to 2000 in Figure 4.

Unlike the general price trend measured by the Art-100 index of Art Market Research, Sotheby's research department, hived off in 1993, found falling

[19] See Christie's International (1992, p. 11).

prices for European paintings in the following years but with a calmer pattern. The price movements in Figure 4 show this clearly and illustrate that prices returned to the 1989 level in 1992. This recovery confirmed the increasing and, as noted above, continuing interest in the nineteenth-century European paintings in recent years.

Figure 4: Face & Van Tol and Art-1000 indices
1992 = 100



Source: Robin Duthy and Art Market Research

Table 2: Price index for nineteenth-century painting
1972=100

1972	100	**1979**	287	**1986**	595
1973	121	**1980**	298	**1987**	624
1974	125	**1981**	314	**1988**	780
1975	170	**1982**	330	**1989**	787
1976	184	**1983**	388	**1990**	697
1977	205	**1984**	460	**1991**	715
1978	286	**1985**	511	**1992**	751

Source: Fase & Van Tol (1994).

A mean nominal gross return per year from investing in nineteenth-century European paintings can be computed simply from the price series in Table 2. The formula is:

$$\sqrt[\tau]{\frac{p_{t+\tau}}{p_t}} \qquad (1)$$

where p_t, $p_{t+\tau}$ are the indicators in the base year and observed year.[20] In my example, this gives a return of 10.6% per year if 1992 is taken as the end point. This is a gross figure as there are hardly data to take account of auction costs and insurance premiums. The spread is surprisingly small with a standard deviation of about 0.12%. Allowing for the viewpoint defended in section 2 of this essay that investing in art is one of many possibilities in an investment portfolio, it is interesting to ask how these figures relate to the investment result and spread according to other art price indices or the investment income from other financial assets. These questions are addressed below.

[20.] This formula can also be written as $(\ln p_{t+i} - \ln p_t)/\tau$ or $\frac{1}{\tau}\Delta \ln p_t$, which approaches $\frac{1}{\tau}\frac{\Delta p}{p}$ if a calculator or log tables are not immediately available.

5 Art as investment

There are only a few examples in the literature in general and in economic literature in particular of research into the financial gains from investing in art. This subject has only recently been receiving attention and was without doubt fed by often short-lived booms in prices on the art market, in particular for paintings. The earliest study is the almost-ignored one by Wagenführ (1965). This German book contains price data for oil paintings (grouped by painter) and for other collectibles, but no computations of the return. Better known, thanks to the greater attention they received at the time, are the studies by Anderson (1974), Stein (1977) and Baumol (1986). Baumol in particular has prompted a small flow of new investigations and, for that reason, may be regarded as pioneering. Furthermore, Baumol was published at about the same time as the prices for paintings boomed. This was perhaps the main factor prompting attention for the return on investing in art.

5.1 Actual return on painting in general

In their fine survey of studies into the return on art, Frey & Eichenberger (1995) argued that three considerations were the foundation of such computations and publication in the literature. The first, as we identified above, is that the art market is a market like other capital markets and for that reason is a natural area of interest for economists. The second consideration that Frey & Eichenberger identified is the internal dynamism of economics as a profession. This refers to the remarkable and almost irresistible urge of economists to apply newly-developed techniques in new fields in order to demonstrate their statistical virtuosity. Although rarely the main subject, the economics of art and in particular the portfolio-investment theory of art as investment have benefited from this enormously. Consequently, analogous to the attention to portfolio-investment theory, interest emerged regarding the question of the efficiency of markets for art, for the inter-relationships between capital markets in general and the art market in particular, centring on causality and co-integration analyses and more abstract empirical research into price formation. An incidental finding is that the art market is much less homogeneous than the financial market which again offers a challenge for demonstrating the researchers' statistical ingenuity. Frey & Eichenberger's third consideration in explaining the increased interest among economists is the personal interest of the art collectors among them. Consequently, they give specific attention to the return on their art purchases, using their theoretical economic and empirical

knowledge, and incorporate the operation of art auctions in their analysis. We identify a fourth consideration which is closely related to the three listed above. It is, furthermore, entirely an extension of the professional interest of economists in the practical significance of their calculations of returns. This fourth motive concerns the issue of which interpretation should be attributed to the possible discrepancy between the returns on art and on alternative investments in financial assets or real assets such as property or gold. The fact that the latter is usually higher, as argued by e.g. Baumol (1986), Fase & Van Tol (1994), Fase (1996) and Generale Bank (1993), is supposed to mean that in fact a psychic or subjective income or return, to use the terminology of Irving Fisher (1906, pp. 165-179), can be derived from the possession of art as, without it, people would not invest their money because of the alternative costs. However, such an economic explanation would make the boundary between investment and consumption rather vague and it would also, probably, blur the approach for rational analysis. That said, the returns for paintings and art computed in the literature show a wide range. Table 3 summarises the relevant computations grouped by type and movement. This summary does not pretend to be exhaustive, but it provides a reasonable selection of what the literature has provided in this field to date.

One of the notable features of Table 3 is the great range of financial returns, even within reasonably homogeneous categories. This range applies to both nominal and real returns. It is perhaps not surprising that the range of real returns is smaller than the range of nominal returns, given the uncertainty on excluding the inflation component, but the range in itself is remarkable. With respect to the return on the group of paintings in general, the length of the period studied appears to offer a first approximate explanation: the longer the period the lower the mean return, and this applies to specific paintings, watercolours, screen prints and prints alike. The explanation for this is the great volatility in the relevant prices over time. This is a direct consequence of demand setting the price, with changes in subjective preference and the fixed and relatively small supply being invariably reflected in the price.

A second element in Table 3 worthy of consideration is the computational method used. This appears not to be insignificant to the return result obtained. This clearly comes to the fore in the research by Buelens & Ginsburgh (1993), prompted mainly by criticism of data being left unused in the regression which was only on data from repeated sales. Subsequent studies by inter alia Bauwens & Ginsburgh (1994), Ginsburgh & Jeanfils (1995), Chanel, Gérard-Varet & Ginsburgh (1996) and Ginsburgh & Penders (1997) have elaborated on this and the RSR approach has disappeared into the background. The cited

Table 3: Return on investing in paintings, reported in the literature

Author	Style period	Sample period	Computation method	Mean percentage return		Considered alternative percentage return
				Nominal	Real	
Pictures in general						
Anderson (1974)		1780-1970	Hedonic price index	3.3		6.6
Ditto		1951-1960	Ditto	3.7		
Baumol (1986)		1652-1961	RSR		0.55	2.5
Buelens & Ginsburgh (1993)		1700-1961	Hedonic price index		0.9	
Frey & Pommerehne (1989)		1635-1987	RSR		1.5	3.0
Ditto		1950-1987	Ditto		1.6	2.4
Goetzmann (1993)		1716-1986	Ditto	3.2	2.0	4.3
Ditto		1850-1986	Ditto	6.2	3.8	4.1
Ditto		1900-1986	Ditto	1.8	1.3	4.8
Sotheby's		1975-1992	Linear composite price index	15.0		
Stein (1977)		1946-1968	Geometric price index	10.5		14.3
Specific movements						
Anderson (1974)	Impressionism	1900-1965	Hedonic price index	3.7		
Ditto	Ditto	1951-1969	Linear composite price index	17.5		
Ditto	Late Renaissance	Ditto		7.8		
Ditto	Drawings and prints	Ditto		27.0		
Ditto	English school	1825-1965	Hedonic price index	3.6		
Buelens & Ginsburgh (1993)	Impressionism	1900-1961	Ditto		3.0	
Ditto	English school	1700-1961	Ditto		0.6	
Chanel et al. (1994)	Specific artists	1960-1988	Ditto		6.7	

Author	Style period	Sample period	Computation method	Mean percentage return		Considered alternative percentage return
				Nominal	Real	
Fase & Van Tol (1994)	19th century	1972-1992	Linear composite price index	10.6		
Ginsburgh & Penders (1997)[a]	European great masters	1972-1999	Hedonic price index	15.8		
Ditto	American masters	Ditto	Ditto	15.5		
Ditto	Conceptual art	Ditto	Ditto	18.9		
Ditto	Minimal art	Ditto	Ditto	23.8		
Ditto	Land art	Ditto	Ditto	20.0		
Holub et al. (1993)	Drawings	1950-1970			11.3	
Ditto	Watercolours	Ditto			15.8	
Mok et al. (1993)	Modern Chinese prints	1980-1990		53.0		
Pesando (1993)	Prints in general	1977-1992			1.5	2.5
Ditto	Picasso				2.1	2.5
Pesando & Shum (1998)	Picasso prints	1977-1996	RSR		1.5	3.5
Rouget et al. (1991)	1950s pictures	1960-1990			5.9	
Sotheby's	Old masters	1975-1991	Linear composite price index	14.8	)	
Ditto	19th century	Ditto	Ditto	12.8	)	14.8
Ditto	Modern impressionists	Ditto	Ditto	15.6	)	
Stein (1977)	Old masters	1820-1965	Ditto	4.1		

Note: the reported alternative return is in real or nominal terms in accordance with the reported computed return on art; if nothing is stated, the author did not report a figure.

a) The standard deviation corresponding with the mean is always very high and is between 24.5 and 60.1; it is also a manifestation of a narrow market for modern American art and the short sample period.

studies by Ginsburgh et al. all relate to the market for paintings and furthermore pay particular attention to the significance of the measurement method for the result. One of their principal conclusions is that the computed return is often sensitive to the statistical method used, and to the sample period under review. With respect to the method, they prefer the hedonic price index method as a basis for return computations. In principle this does justice to the influence of the characteristics of the traded pieces on the price, but the practical application is usually less far-reaching than theoretical ambition implies. Thus a logical preference is not possible in the choice of the sample period as the availability of data, certainly further back in the past, determines the application.

With this we come to a third aspect of the results in Table 3. Most researchers use data on auction prices for specific paintings collected by Reitlinger (1961, 1970) and analysed carefully and critically by Guerzoni (1995). In view of this, it is, of course, not surprising that the research method determines the result. A few researchers compile their own material or use a different database, namely that published by Mayer (1971). Most of the researchers using these databases work mainly with the prices and volumes he aggregated. The index issue is thus an inevitable fact.

A fourth aspect in the return data in Table 3 is that they sometimes relate to less generally formulated paintings. But for these too, as the figures in this summary show, there is a large range of findings. Finally, and this is a fifth aspect identified by Goetzmann & Spiegel (1995), the distinction between short-term and long-term returns appears to be significant. These authors find a statistically significant return in the long-term, even when no return is apparent in the short-term.

5.2 The return on specific movements or painters

The need to aggregate a composite index, and hence the necessity for a hedonic index, declines as soon as attention is focused on individual artists. This has also been tested by various researchers. Interesting examples of this aggregated approach are offered by the work of Pesando (1993) and Pesando & Shum (1999) for Picasso prints, Agnello & Pierce (1996) for individual North American painters, De la Barre and Docclo & Ginsburgh (1994) for some dozens of individual modern and sometimes contemporary artists from a number of countries (e.g. Appel, Bonnard, Chagall, Ernst, Kandinsky, Klee, Renoir, Tapiès, Vlaminck) and Agnello & Pierce (1996) for a number of genre

painters. It is reasonable, therefore, that these authors are working with homogeneous samples of auction prices. The work of Ekelund, Ressler & Watson (1998) on auction prices in Latin America also deserves noting here, even though its area of attention is the distortion of prices from failed sales at auction because the reserve price was not reached.

A feature of the research into individual painters is that the usual research method is repeat sales regression or RSR. This is probably related to the fact that in this situation there is greater homogeneity. The associated computations demonstrate – and Table 3 illustrates this – that moving from the general to the specific and as the studied time period becomes shorter, the interrelated variations in the numerical return become greater and the picture more diffuse. This is not surprising, as the very need for a general picture necessitates the use of composite indices with their inevitable statistical complications and simplifications. The rather forgotten and in many respects pioneering work by Wagenführ (1965) also focuses on price changes over the course of time of named canvases by individual painters. In general, returns can be derived from this in the same way as we attempted at the beginning of this essay with Van Gogh's 'Dr Gachet' and Israëls 'Mannequin in front of a full-length mirror' although Wagenführ did not do this. What he did do, however, was widen his area of research to other objects for which there were auction prices. This is addressed further in section 5.3.

Other than the analysis by Fase & Van Tol, as noted above, most of the compiled returns in Table 3 have been derived from the Reitlinger database. This records the prices of individual paintings and drawings, to the extent that they were placed on the market. Another source is offered by the price data of Mayer and those of the auction houses such as Christie's and Sotheby's. Fase & Van Tol based their calculation on this latter material. Another database, which has only been available for a few years, is that of Robin Duthy & Art Market Research. This is the continuation of the data collection prepared by Sotheby's. This firm compiles the AMR price index and price indices for a number of sub-markets (see Box 6 for the statistical details) and these form the basis for one of the price graphs, set out in Figure 5. The price indices for a number of sub-markets according to the AMR price index are also given in Figures 2 and 3.

Applying comparison (1) on page 28 to the price series in the AMR databank gives the return per year in the market for paintings in general and for specific schools. The results of these computations are summarised in Table 4.

Box 6 Methodology of the AMR price index

The AMR price index measures the development of the average market value of paintings and sculptures created by an individual artist or group of artists against the base period 1974/75. The computation of the index is based on the market prices of paintings, gouaches, drawings, etc. by the relevant artists. These prices are recorded worldwide at about 800 auction houses in pounds sterling or the equivalent on the day of sale. The prices for twelve consecutive months are considered for each artist. This approach eliminates any seasonal effects. Exceptionally high or low prices during this period are eliminated to exclude extremes which could disturb the general market picture. Finally, the mean of the remaining prices is computed and divided by the mean of the corresponding month in the base year. This initial index figure per artist is then smoothened – in other words, chance fluctuations are removed – by establishing a fourteen-month moving average.

The same approach is used for groups of artists, although the initial index is the ratio between the sum of the mean price per artist in the current and base periods. In algebraic form, this can be summarised as the index formulae below:

The AMR index for the artist i in month t, $\mathrm{AMR}_{i,t}$, is the three-month moving average

$$\mathrm{AMR}_{i,t} = \frac{1}{3}\sum_{k=0}^{2} \widehat{\mathrm{AMR}}_{i,t-k} \tag{1}$$

of a preliminary index defined as

$$\widehat{\mathrm{AMR}}_{i,t} = \frac{\dfrac{1}{n_{i,t}} \displaystyle\sum_{j \in J_{i,t}} \sum_{\tau=0}^{11} p_{ij,t-\tau}}{\dfrac{1}{n_{i,0}} \displaystyle\sum_{j \in J_{i,0}} \sum_{\tau=0}^{11} p_{ij,0-\tau}} \times 1000 \tag{2}$$

In this formula $p_{ij,t}$ j represent the nth auction proceeds of a work of art of artist i in month t in pounds sterling; $J_{i,t}$ the collection of all auction sales of artist i sold in month t and the 11 preceding months. Furthermore, all sales which are in the top or bottom decile are removed from the collection; $n_{i,t}$ the number of sales in collection $J_{i,t}$; $t = 0$ the last month of the base year of the index.

The AMR index for a group I of artists in month t is the three-month moving average

$$\mathrm{AMR}_t^I = \frac{1}{3}\sum_{k=0}^{2} \widehat{\mathrm{AMR}}_{t-k}^{\,I} \tag{3}$$

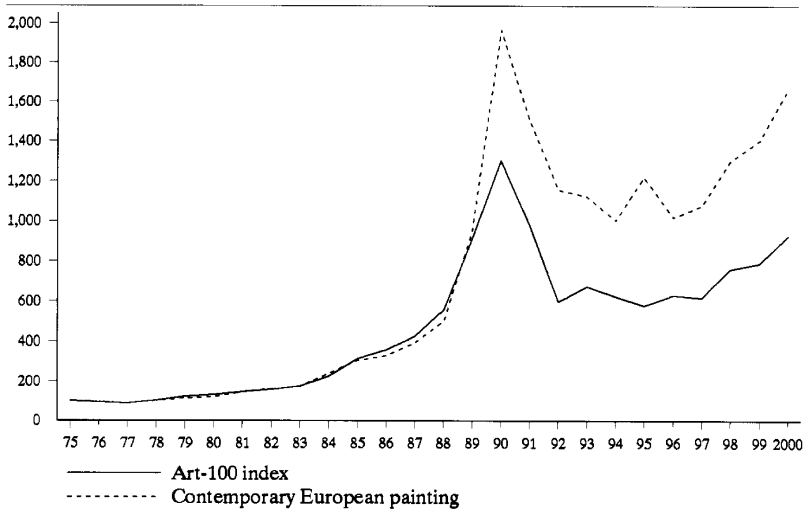
of $\widehat{AMR}_t^{\,I}$ defined as

$$\widehat{\mathrm{AMR}}_t^{\,I} = \frac{\displaystyle\sum_{i \in I} \frac{1}{n_{i,t}} \sum_{j \in J_{i,t}} \sum_{\tau=0}^{11} p_{ij,t-\tau}}{\displaystyle\sum_{i \in I} \frac{1}{n_{i,0}} \sum_{j \in J_{i,0}} \sum_{\tau=0}^{11} p_{ij,0-\tau}} \times 1000 \tag{4}$$

The symbols in this formula are the same as those in formula (2).

Source: Robin Duthy & Art Market Research, London 2000.

Figure 5: Price trends in Art-100 index and contemporary European painting



Source: Robin Duthy and Art Market Research

Table 4: Returns on paintings 1976-2000 according to the AMR index
Annual means

	Nominal percentage return
Paintings in general	9.8
Old masters in general	8.8
Italian old masters	8.3
French old masters	8.4
Dutch old masters	7.2
19th-century European paintings	7.9
Modern European paintings	7.5
Contemporary artists	12.7

See Annex I for a definition of the listed movements.

These figures are comparable with the nominal rates of return in Table 3, especially when it is remembered that the returns in Table 4 cover a relatively short sample period and in that case the uncertainty in terms of variance is greater.

5.3 Return on investments in antiques and other collectibles

There is no obvious reason why the determination of rates of return on investment in art should be limited only to paintings. Consequently, the literature offers a few examples of return computations for other objects such as porcelain, cabinets and other furniture, cutlery, watches and the like, which collectors acquire through the market and especially through auction houses. Purchasing these items involves the decision to invest some wealth in these objects and this choice is basically not different from holding wealth in the form of cash, savings deposits, financial assets or paintings. An overall return can be computed for any type of investment and investment in cash almost always gives a negative return, to the extent that any fiscal advantage from avoiding tax is ignored. The return on collectibles can also be negative. This will particularly be the case for objects subject to fashion such as tin soldiers, antique weapons, glass and drinking vessels which often show large price fluctuations over time. It is surprising, however, that almost no return calculations can be found in the literature for these types of object. Nevertheless, Table 5 summarises a number of findings from the literature, many of which are derived from the article, cited above, by Frey & Eichenberger (1995).

Table 5: Returns on antiques, collectibles and museum collections

Author	Period	Real percentage return	Alternative percentage return	Object
				Antiques
Ross & Zondervan (1989)	1903-1987	2.2		Stradivarius violins
Graeser (1993)	1967-1986	7.0 *	7.3	American antique furniture
				Collectibles
Kelly (1994)	1983-1993	-1.1	3.3	Mettlach beer steins
Wellington & Gallo (1984)	1967-1982	-19.0*		Tin soldiers
Avery & Colonna (1987)	1978-1984	-2.3	4.0	Antique weapons
				Museum collections
Frey & Serna (1990)	1915-1979	2.8	3.2	H. Mettlar, Switzerland (collection of impressionists)
Ditto	1981-1988	3.2	6.9	G. Guttermann, US
Ditto		6.9	7.5	British Railways Pension Fund
Ditto		3.0	7.5	Asiatica

* refers to nominal rather than real rates of return.

Table 5 lists the results for objects and specific collections, referring to the original source. Consulting private collectors who keep records of their purchases or analyse price trends at auctions for specific objects such as clocks, coins or stamps offers a simple and interesting opportunity to expand the results in Tables 4 and 5 with new figures for returns. For the sake of brevity, I have not pursued that avenue for this essay.

5.4 Once again, the return on specific painters

A number of studies focused on determining the return for certain painters rather than a return in general or for specific movements. Individual painters were considered occasionally above, but there was no systematic discussion. The literature does, however, include a few examples of such studies.

This attention to specific returns is unquestionably related in part to the increased interest in pictures as investments and the associated potential return. As well as this practical element, an important consideration is that the value of individual pictures can vary depending on the painter and a number of other characteristics such a subject, style, size, quality of the print, etc. Considering a variety of painters and their works gives a degree of similarity to the composition of an investment portfolio using the expected returns and risks in the various components of the portfolio. A good example in the literature is provided by the research by Agnello & Pierce (1996). As well as returns in general, which were reported above (Table 3), they also analysed canvases by 66 individual American painters based on 15,216 recorded auction sales in the sample period 1971-92. These were painters born before the Second World War and most painters in the sample lived in the 19th century, but all were born between 1749 and 1930. Some of the artists considered are very famous and others are little known. The auction prices reflect this and the mean price for the entire sample is about USD 48,000 with the lowest being USD 185 and the highest almost USD 19 million. That highest price was for Willem de Kooning, a painter of Dutch origin, but artists such as Jasper Johns, Jackson Pollock and Robert Rauschenberg are also in the top price class. The lowest price class in the sample includes painters such as Ernest Major, George Nicholson and Jules Pascin. The authors used hedonic regression (discussed above) as their research method and, as noted in Box 4, the coefficient of the time trend corresponds with the return. I have summarised the distribution of individual returns estimated by Agnello & Pierce in Table 6.

Table 6: Frequency distribution of returns on American painters

Nominal percentage return	Number of painters
< 5	6
5 < 7	10
7 < 9	12
9 < 11	12
11 < 13	12
13 < 15	8
≥ 15	6
Total	66

Source: Agnello & Pierce (1996, pp. 370-371).

The frequency distribution suggests statistical normality and testing supports this hypothesis. This form is also frequently encountered, for example, in the return on fairly homogeneous types of share.[21]

Agnello & Pierce computed a mean nominal return of 9.3% with a range of between 0.6% (for the painter John F. Francis) and 26% (for canvases by Jasper Johns). For comparison, it is noted that in the United States in the period 1971-92, annual average inflation was 6% and the return on equities was 13%, while American treasury bonds and notes averaged 9.7% and 7.4% respectively in that period.

For the individual painters, the highest returns were for Jasper Johns (over 41%), Jackson Pollock (almost 27%), de Kooning and Mark Rotho (both about 20%). At the lower end are Harvey Dunn and Frederich Remington, who were both close to zero for the sample period. These rates of return do, however, show some variation when there is a small change in the regression comparison used, but the general picture revealed in Table 6 for the group as a whole has not been affected by these results per painter. An interesting detail is that rates of return for painters who only practice one genre – for example, landscapes, seascapes or figurative – are often a little higher. Specialising appears to pay in painting too, but Dutch painters during the Republic already knew this. In this case, taking the sample variance into account, this may only be statistical illusion.

[21] See e.g. Campbell et al. (1997).

De la Barre et al. (1994) used their hedonic price index to analyse the price trend for modern art in general and for a number of individual painters in this movement, covering Picasso and a number of artists who are regarded as French Impressionists. By extrapolation, the researchers computed a price index for these painters and a general price index for the 1970s and late 1980s. It would be possible to use this discontinuous price trend to determine a return with a comparison over time. However, it should be expressly noted that De la Barre et al. did not do this, probably because the construction of quantity price indices for paintings was their principal focus of attention. I have, nevertheless, used their price indices to calculate a return. The result of the computation is set out in Table 7.

Table 7: Return on modern European art for seven individual artists

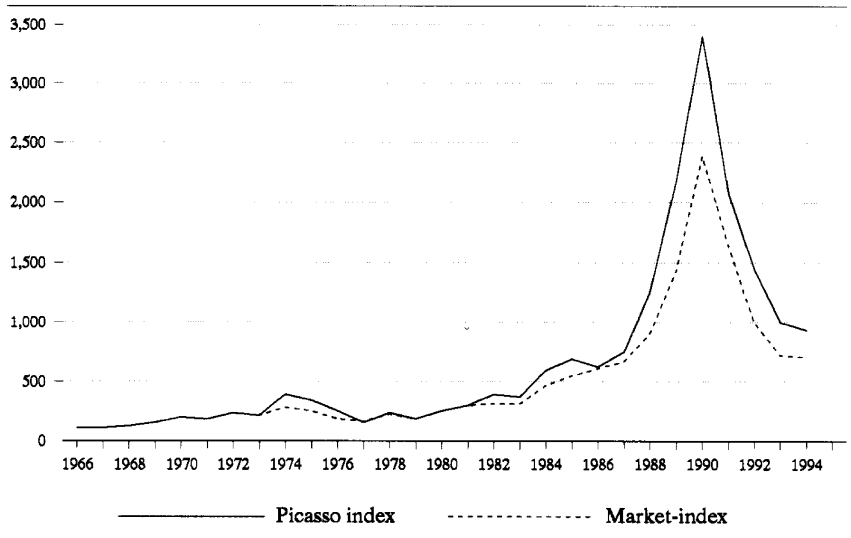
Artist	Percentage return		
	1950-69 (a)	1972-78 (b)	1987-91 (c)
Braque	19	-4.9	15.5
Chagall	24	3.1	7.0
Leger		1.6	9.2
Matisse		2.4	13.8
Monet	21	2.5	3.6
Picasso	22	2.9	4.9
Renoir	13	1.0	-4.6
Modern art in general	17	2.1	8.8

Notes: the figures in column (a) are derived from Stein (1977); columns (b) and (c) are derived from the indices constructed in De la Barre et al. (1994).

Although De la Barre considered a much smaller number of European painters and the sample period was shorter, as with the American painters considered in Table 6, there was a wide spread of rates of return. The considerable difference between the first and second periods is also notable: the average return for the movement as a whole in the first period is about four times as great as in the years 1987-91. The difference in means also applies to individual painters with the fascinating detail that Braque and Renoir swapped positions in this short period with negative average returns in 1972-78 and 1987-91 respectively. This remarkable turnaround is undoubtedly connected with a shift in popularity between the two painters. With this exception, my calculations once again confirm the high point of the art market at the end of the 1980s as shown by other sources.

Stein (1977) – included in the above series – has also computed returns for a large number of movements and individual painters on the basis of the geometric price indices he constructed for the period 1946-68. For this, he used indices of auction prices at Sotheby's in London. A number of returns are set out in Table 7 for the period 1950-65. Without exception, they are much higher for these artists than in the two other series in this table. Stein also obtained these high percentages for the other artists he studied. According to Stein's calculations of average annual returns, Bonnard and Vlaminck are close to Chagall and Monet, as all saw increases in value of over 20% per year, while Stein's lowest returns were for Fantin-Latour, Pissarro and Roualt. However, at about 16% per year these three were still well above the return for Renoir. It should be noted that Stein's sample is somewhat smaller and his index numbers technically less sophisticated than those of De la Barre et al. This also applies to the characteristics of the canvases considered, compared with the hedonic indices of De la Barre et al. Stein concluded at the time (in 1977) that the expected return on investing in paintings was only three-quarters of that on shares. In addition, according to Stein, the value of paintings was no more stable at the time than that of shares, and so, in his opinion, investing in paintings offered no guarantee against economic instability.

Figure 6: Comparison of Picasso price index and Market index



In Table 7 Picasso stands out for the period 1950-69 and the question may arise as to whether this has a more general significance in the sense that price formation was different, during his long life, for this painter who was active for so long from that for the art market in general. Czujack (1997) considered this question for the period 1963-94. Using hedonic regression, she compiled a general price index for Picasso based on auction sales of Picassos during 1963-94, with a sub-distribution into the eight stylistic periods of his artistic life normally identified by art historians. The final outcome of this exercise is interesting. Her empirical study firstly shows that Picasso's works from his blue and rose periods raised the highest prices.[22] Czujack's second empirical finding is that the price movement of Picassos in the period 1963-74 runs almost parallel to the trend of the market index. As illustration, I reproduce her graph on this as Figure 6. Czujack's final conclusion is unambiguous: in general, Picassos do not stand out in terms of price. Pesando (1993) earlier and Pesando & Shum (1999) later come to the same conclusion with respect to Picasso's screen prints and prints.

[22] The blue period – about 1902-04 – expresses mainly depression, sadness, poverty and loneliness and the rose period – roughly 1904-06 – expresses jollity including through clowns and harlequins.

6 Rates of return considered more closely

There is a wide range of monetary and real rates of return for painting in general and for individual artists, and for special collectibles such as drawings, prints or antiques. As well as variety, a general characteristic is that the computed return is almost always lower than the market rate of interest. In other words, the income from an alternative to the purchase of paintings is some percentage points higher than the return from investing in paintings. This observation raises at least two questions which require further attention and analysis. The first is whether there are perhaps special market circumstances or considerations which can be identified for this not insignificant difference in returns made on financial markets. The second question is whether a calculation method based on compound interest may not be too mechanical, ignoring the motives that may underlie the acquisition of art.

6.1 The monetary yield on art and the market rate of interest

Unlike participants in the financial markets, the participants in the art market, and therefore also the market for paintings, prints and drawings, come from various different groups. Firstly there are private collectors who, in general, do not focus on making a profit and, like in the behavioural finance approach, this introduces an element of irrationality to the theoretical framework of the classical portfolio model. Abandoning that model and replacing it with a different framework such as the logic of behavioural finance with its emphasis on the psychology and experience of individual investors often provides an explanation for the anomalies actually observed. Private art collectors – as identified by Frey & Eichenberger (1995) and Pommerehne & Feld (1997) among others – are guided to a large extent by the fact that they own a work: what is known as the endowment motive. This means that an object which is already owned is valued more highly than an object that still has to be purchased and only the latter has to compete on the capital market with financial assets which the private collector has to sell to finance his purchase. An additional element is the presence of a collection. If a collection already exists, the purchase of a work is often prompted by the consideration that it would increase the value of the entire collection. Consequently, the additional value of the purchase is greater than purely financial consideration of investment alternatives would indicate. Finally, there is also the consideration that works of art inherited from parents or other family

members are, for sentimental reasons, given a higher value than their monetary value indicated by the return. This also results in the monetary return on a work of art playing a secondary role.

In addition to public and private collections, there are also company art collections, often of modern art and sculpture. Company art collections very often exist in profit-based businesses where senior management have (or have developed) an interest in certain types of art. Building up such a collection is an activity which companies can justify, given their often solid market positions, outside the realm and necessity of day-to-day competition which does have to be respected for core business activities. A good example of this, noted in table 3, is the British Railways Pension Fund collection. Another well-known example is the collection of the American company, Sara Lee, which once belonged to its founder, the businessman Nathan Cummings of Chicago. It is as easy to find other good examples as it is to calculate the return on such collections.

Public museums are major purchasers of art. Their purchases are subject to significant financial restrictions. In addition, they sometimes obtain special monetary support for important works to complete their collections. In these unusual circumstances, the sellers obtain relatively high prices for such pieces. According to the customary computational method of compound interest, also used in this essay, this automatism results in a higher return. Pommerehne & Feld (1997) have empirically tested the hypothesis that public museums paid out higher amounts than other collectors for the United States using purchase data for the period 1820-1970. In the 1126 cases that they examined of non-speculative sales – *resales* in their terminology – 112 purchases were made by public museums. The mean real return on those transactions was over 4% compared with 1.1% for the other ones. This result confirms the hypothesis set out above. Furthermore the spread of returns on purchases by public museums proved to be smaller than for the other purchases. This could indicate a cautious and well-considered purchase policy by the public museums. This is summarised in Table 8.

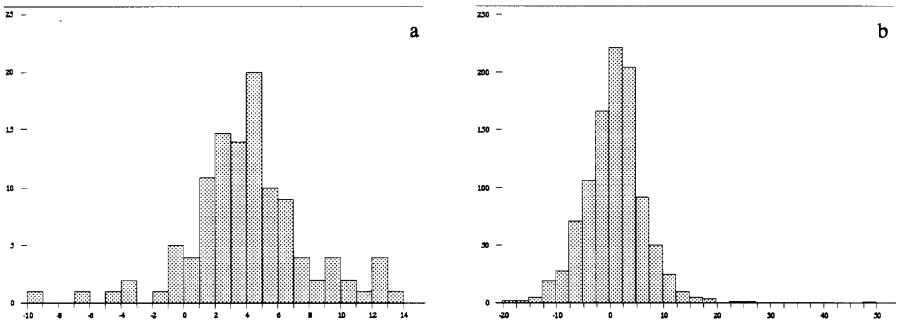
Table 8: Real return per year for non-speculative sales 1820-1970 in the United States

	Number of transactions	Percentage return				
		Mean deviation	Median deviation	Highest deviation	Lowest deviation	Standard deviation
All resales	1,126	1.4	1.7	47.7	-19.3	5.5
of which:						
– Public museums	112	4.1	4.4	13.9	-9.9	3.8
– Other	1,014	1.1	1.4	47.7	-19.3	5.4

Note: non-speculative in the sense that the seller had owned the work for at least twenty years.

The fact that the differences in the mean return for the two categories of purchaser are statistically significant and do not originate in exceptions in the sample used is confirmed by the underlying frequency distribution of rates of return for the two groups separately. This is reproduced in Figure 7. Furthermore, Pommerehne & Feld do not reject the hypothesis that they are of the same type. Their findings also suggest that the purchasing policy of public museums in the United States is dependent upon the state of the economy and makes less use than other collectors of opportunities over time. This brings us to the other general focus of attention, namely the degree in which the mechanical computation of returns gives a biased view, insofar as no account is taken of the underlying behavioural considerations.

Figure 7: Frequency distribution, real rates of return for canvasses sold to (a) public museums and (b) other 1820-1970



Source: Pommerehne and Feld (1997, p256)

The computation of returns is based on observed price increase over the period that a work is held by the seller. This means that the considerations that, whether or not inevitably, have contributed to the price trend are largely ignored, but are nevertheless reflected in the price data used. Almost all analyses rely on auction prices, in other words price formation in the tertiary market. Consequently, the prices for the possibly no less significant volumes sold through galleries and the antiques trade (the secondary market) are excluded and do not distort the computed return only to the extent that the price trends in the secondary and tertiary markets run entirely parallel. This is probably not the case. Auction prices are in the nature of wholesale trade prices, as the principal purchasers at auction houses are traders. Consequently, it is reasonable to assume that private collectors pay higher prices than auction prices and receive lower prices when selling, so that a private individual's return is on balance lower than reported in the literature. A similar comment applies to the effect of insurance premiums and transaction costs, which can be high and, therefore, significantly reduce the net return stated for example in Table 3. Finally there is a tax effect which concerns the fact that purchasing art is a way for residents of many countries to avoid taxes or a technique for laundering money. Little is currently known of the precise significance of this for price formation. It is almost certain that the returns are distorted upwards by the additional demand created by tax avoidance.

Most studies compare the returns on alternative investments in, for example, government bonds or, occasionally, shares. In almost every case, and certainly when a long period is considered, the returns on paintings and other collectibles are lower than that on the alternatives in the financial market. To the extent that art is a risky investment, comparable with shares, this systematic discrepancy is remarkable in the light of, for example, the discussion of the 'equity premium puzzle'[23]. According to this analysis, art should enjoy a higher return with customary risk behaviour. The fact that almost invariably the return for art is lower than for almost risk-free investments means that motives other than investment considerations, the standard risk behaviour and the associated future income, play a dominant role for art collectors. As a rule, collectors do not purchase to sell later and thus – other than in speculative trading – are not very sensitive to risk. Their price and cost sensitivity is also probably modest. This is different in the

[23] See e.g. Mehra & Prescott (1985), Kocherlakota (1996), Siegel & Thaler (1997) and the analyses for the Netherlands and Europe by Fase & Van de Poll (1996) and Fase (1997) respectively.

speculative trade, where, in general, marginal returns and expenses will be considered and there will be a view of future movements in taste and preferences for genres. The explanation of this difference in the pattern of reaction has to be sought in the additional income that the real collector derives from his collection. This is his psychic income. In the end, such income rests on the enjoyment derived from a painting and the social standing that the possession of an art collection gives the owner. For the time being, precise measurement of this psychic return is an illusion, but in any event, the difference between the measured return on art and that for a risky investment offers an initial quantitative estimate. Development of this approach may be an area of interesting research and economic experimentation.

6.2 The market for paintings as a segment of the international capital market

A common view is that investing in art offers a guarantee against inflation and, therefore, in any event maintains the real value of the invested wealth. Comparison of the trend of, for example, the consumer price index and that for the art market over a long series of years supports the argument even if sometimes – for example during 1988-90 – the price trend for art was much more exuberant than the general price level. These exceptions, as shown by the graph in figure 6, are, however, in the nature of short-term imbalances which hardly breach the expected long-term trend. Another question is whether such a comparison is useful and whether comparison with the price trend for property would be more appropriate. This brings us immediately to the important question of an inter-relationship between the art market and the capital market in general. In principle there are two answers to this question. The first answer is negative. The consideration here is that the art market and its price trend have nothing in common with the trend of returns in financial markets. The other reply is affirmative and comes from the argument that the art market is a sub-section of the capital market and therefore subject to the same principles of a balance between income and risk for different assets. Both approaches have been extensively and thoroughly tested empirically in the literature. It would seem sensible to summarise these results to put us in a position to reach an opinion on this important question, which can be placed in both a national and an international context and is studied in the literature as such.

Sales in the art market are concentrated in the auction houses of New York and London, which together represent about 75% of the total. Paris is in third place with a share of about 6%. These sales are predominantly generated by

Sotheby's and Christie's, where the top end of the market for pictures is auctioned, while the lower-quality canvases are offered elsewhere, and this distorts the selectivity. This view is supported by analysis of the influence of the auction location on the final price, as performed for example by Czujack (1997). The conclusion that there is an international market for paintings in the top segment appears to be justified. There is, however, a separate market segment for more specific movements with a predominantly national character, such as contemporary American *land art* and *minimal art* or Latin American painting. The price trends on these markets have their own pattern as shown by the statistical analyses of, for example, Ekelund, Ressler & Watson (2000) and Ginsburgh & Penders (1997). This is explained by the absence of price arbitrage. It is this element that creates cohesion with other parts of the capital market. It is important to note that a financial instrument such as a share or bond represents a claim on the yields of future productive efforts. In the case of art, however, aesthetic enjoyment and the social status that the possession of art gives the owner are central and the value of this is, as it were, embodied in the price of the object. The connection with the financial side of the capital market arises from discounting the income over time in which the rate of interest used for discounting is the linking parameter. In this respect, the analogy with property and housing, in particular, is unmistakable. The available empirical research into the relationships between the art market and other parts of the capital market supports this approach, but adds nuances to it. The first author to pay specific attention to this relationship, Stein (1977), identified a weak correlation between auction prices and share prices in London and also in New York. Nevertheless, Stein departed from the customary view and concluded at the time, 1977, that investing in art was not particularly profitable compared with investing in financial assets. Furthermore, the value of art is as subject to fluctuations in the state of the economy as stock market prices. More recent empirical research by inter alia Buelens & Ginsburgh (1993), Chanel et al. (1994), Chanel (1995), Gérard-Varet (1995), Ginsburgh & Jeanfils (1995), Candela & Scorcu (1997), Singer & Lynch (1997), Biey & Zanola (1999), Flôres et al. (1999) and Pesando & Shum (1999) concentrated on the relationships between the price of paintings and various sub-sections in the capital market. This is usually done in the economists' traditional style of demonstrating their technical statistical ingenuity to the full (see Box 7). Application of VAR models, causality analysis and co-integration techniques served as the latest novelties, but furthermore opened the possibility of avoiding the permanent danger of trend correlation. The sample periods which were used by the above authors vary as, therefore, do the findings. Buelens & Ginsburgh concluded that there was a weak relationship between the markets for paintings and the

stock markets in the principal financial centres. Their statistical analysis was further refined and expanded in Ginsburgh & Jeanfils by the application of causality and co-integration analysis. They concluded on this basis that there was a long-term relationship between comparable segments of the art market – the great masters, American contemporaries and the other painters – and the stock market, but also argue that although the stock market is not influenced by imbalances in the art market, it is the case in the opposite direction. The other causality and co-integration studies showed similar results. The study by Candela & Scorcu is worthy of note as it focuses in particular on the Italian art market, which is the fifth largest internationally, and furthermore makes a comparison with the property market. The authors found that in the short term income from paintings lags behind that from the financial markets but that in the long term there is no relationship between these elements of the capital market. According to their analysis, however, the relationship with property prices is unmistakable. Pesando & Shum investigated the relationship mainly from the optimum investment strategy and opportunities for portfolio diversification. Based on the simple correlation coefficients they discovered, they regarded the opportunities as modest: they only saw any room for diversification into financial assets for certain screen prints, including Picassos.

In summary, the empirical literature on the relationship between the segments of the market for paintings and the capital market shows that the relationship varies in strength but is not entirely absent. There are, however, only modest opportunities for exploiting this in the composition of an investment portfolio to the extent that attention is restricted to wide groups of art. There are, however, interesting possibilities if one focuses on specific categories.

Box 7 Test of persistent relationships between sub-markets

Questions on the nature of relationships between the capital market and the general market for paintings or between the general market for paintings and the market for specific movements or painters are sometimes posed in the literature on the returns from picture ownership. This is perhaps because the authors concerned, such as Frey & Pommerehne, also want to demonstrate their statistical ingenuity. This involves testing the dynamic interaction between sub-markets, avoiding the ever-present trap of trend correlation. The central variables are the rates of return in the observed sub-markets. Statistical core concepts are co-integration and weak exogeneity with respect to long-term dynamism on the one hand and short-term Granger causality on the other. See for example, Maddala & Kim (1998) for an explanation. The statistical framework is for example, the following model:

$$\Delta y_{1,t} = \alpha_1(y_{1,t-1} - \beta y_{2,t-1}) + \gamma_{1,1}\Delta y_{1,t-1} + \gamma_{1,2}\Delta y_{2,t-1} + \varepsilon_{1,t}$$

$$\Delta y_{2,t} = \alpha_2(y_{1,t-1} - \beta y_{2,t-1}) + \gamma_{2,1}\Delta y_{1,t-1} + \gamma_{2,2}\Delta y_{2,t-1} + \varepsilon_{2,t}$$

where the term $y_{1,t-1} - \beta y_{2,t-1}$ describes the long-term equilibrium and the term $\gamma_{i,1}\Delta y_{1,t-1} + + \gamma_{i,2}\Delta y_{2,t-1}$ is the short-term dynamism for i=1,2. There are a number of ways to estimate the αs, βs and γs in this model. For us it is important to determine whether there is a long-term equilibrium. To the extent that one does exist, the direction of causality also has to be established. Taking y_{1t} and y_{2t} as the return on an existing sub-market, this statistical approach makes it possible to establish whether the long-term returns are related or whether a single market dominates. As noted in the main text this is the subject of analysis by Ginsburgh & Jeanfils (1995) for the international art and capital markets, by Czujack et al. (1996) for the general art market and sub-markets for individual painters (Braque, Chagall, Ernst, Miró and Picasso) and silk prints. Flôres Jr. et al. (1999) researched in the same way within the context of the picture portfolio the relationships between the markets for great masters, other painters and American painters.

7 In conclusion some policy implications

The art market, as argued inter alia by the economist Throsby (1994) in his analysis of markets for types of art, is built up hierarchically from sub-markets. This is not without significance for price formation and thus for the return on paintings which has been at the heart of this essay. The bottom rung of the art market, which he calls the primary market, is fairly disorganised and provides opportunities for starting or unestablished artists. The sales channels are small galleries, local art markets or fairs and small traders. The purchasers are mainly private individuals. Price formation is usually patchy and the market is not very transparent. The second layer is the secondary market. Established artists, the art trade and well-known galleries together with private collectors, museums and companies interested in building up their own collections are the participants in this market. The trade is localised mainly in large cities such as New York, San Francisco, London, Paris, Amsterdam and Sydney. Access to this market for the individual artist is a mark of recognition which opens the door to commercial success. Galleries and dealers exercise great influence on price formation and there is a situation of asymmetrical information, certainly with respect to the work of deceased artists. In this segment too, price formation is incomplete, with what De Jong (1951, p. 197) calls in his system of market types 'monopsonistic competition', in other words a buyer's market. The so-called 'lemon' problem, known in the second-hand car market, sometimes crops up in this market and distorts price formation because the price acts as a measure of quality for the lack of anything better. This is also the market where excellent forgeries are offered and there is room for dishonest behaviour. The highest level in the market hierarchy is the international auction houses such as Sotheby's, Christie's, Phillips, Finarte and Drouet. The participants in this tertiary market are well-informed and often expert. It is an international and transparent market for a non-homogeneous commodity. For paintings, this is the market which underlies the majority of the computations of returns, referred to above.

A particular feature of the returns identified is that they are almost never a result of speculative behaviour. The majority of the canvases studied had been owned by the seller for at least 20 years. Nevertheless, the rates of return give expression in some way to the preferences of the buyers on an international market for paintings. This market is, furthermore, part of the

capital market, where the law of a single price tends to apply. Consequently, it is necessary to interpret the identified deviations in economical terms.

The above brings to light that almost without exception returns made in the financial market are higher than those on painting, to the extent that speculative purchases are ignored (this is, for example, the case with contemporary American art such as *land art*, *minimal art*, and so on). The investor's return on property or precious metals is also higher despite the fact that these objects, like paintings, have an intrinsic value. Financial assets do not have such an intrinsic value and this almost always manifests itself in a higher nominal return. This difference means that individual owners of paintings are prepared to make a financial sacrifice for their preference to own canvasses. For this, they get the satisfaction of an aesthetic or social benefit. This is the psychic or subjective income acquired from forgoing a certain investment return. In a way of speaking, the painting provides consumptive services to its owner. In addition to this private alternative cost aspect of the consumptive approach there is also, however, the argument in the wealth approach that there are social costs through the sub-optimal allocation of assets. This view changes expressly if and to the extent that a different theoretical framework, for example that of behavioural finance, is used as the starting point.

At first sight and from a markedly normative angle, it is possible to view sub-optimal use as undesirable under a given approach (or hypothesis) from the viewpoint of social welfare. Strictly speaking, as argued more than 50 years ago by the Dutch wellfare theoretician Hennipman (1945), such an opinion is not possible on logical grounds as it assumes a rationality with respect to consumptive services which is not justified. In the end, to quote the British economist Lionel Robbins (1971) this concerns '… a question of ultimate values, a question of what you think to be the purpose and function of the state as the authoritarian element in society, a question of political philosophy'. This can be concurred with fully. The economic political philosophy underlying my essay is that of a free economic order which, however, wishes to internalize the external effects as far as possible. With respect to paintings, this could be in the form of a levy on private individuals on their ownership to adjust for the discrepancy between private and social costs. Another possibility is to impose a social obligation to make private collections available from time to time at museums and suchlike – compare the gesture by the Kramersky family with respect to the 'Portrait of Dr Gachet' – so that they become a collective good. For institutions such as the British Railways Pension Fund, it could be an obligation to hold public

exhibitions. In the light of fiscal history of the ability-to-pay principle of taxation as set out by Grapperhaus (1993), among others, this would be a reversal of the medieval lord-serf relationship. This would generate a social benefit, as it were, to neutralise the social costs.

There is also a completely different conceivable element of social costs. Art sales since the mid-1970s – clearly illustrated by Figure 1 – have risen to astronomical heights. To some extent, this is certainly a consequence of the wealth built up by economic prosperity including rising stock exchange prices etc. On the other hand, there are strong indications – see for example Schneider & Enste (2000), Fase (2000b) – that unofficial economies in western society in general and in the Netherlands in particular have grown considerably. This is probably partly at the cost of tax revenues to the government. At the same time, the question arises whether this also explains the flourishing of the art market as this market provides an excellent opportunity to return to the official economy. Political philosophy also plays a significant role in assessing this. The lower return on paintings does not appear in any event to be in conflict with the thought that this too furthers the gap between social and private costs. Whether this is to be regarded as proper is another question.

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ANNEX I

Total turnover: pictures at art auctions
(x USD million)

Season	Turnover	Season	Turnover	Season	Turnover	Season	Turnover
1970/71	87.59	**1978/79**	291.97	**1986/87**	1282.50	**1994/95**	1575.00
1971/72	94.89	**1979/80**	394.16	**1987/88**	1800.00	**1995/96**	1755.00
1972/73	186.13	**1980/81**	445.25	**1988/89**	3075.00	**1996/97**	2010.00
1973/74	215.33	**1981/82**	343.06	**1989/90**	4650.00	**1998/99**	2516.57
1974/75	145.99	**1982/83**	350.36	**1990/91**	1575.00	**1999/00**	2860.29
1975/76	167.88	**1983/84**	518.24	**1991/92**	1192.50		
1976/77	189.78	**1984/85**	613.13	**1992/93**	1207.50		
1977/78	226.28	**1985/86**	664.23	**1993/94**	1342.50		

Source: Corb and Eckstein, 1997.

ANNEX II

DEFINITIONS OF GROUPS OF ARTISTS

The group indices are based on the works of the following artists.
Source: Art Market Research, http://www.artindex.co.uk

Italian old masters
Stefano Della Bella, Canaletto, Luca Giordano, Francesco Guardi, Giacomo Guardi, Giovanni Francesco Guercino, Antonio Joli, Andrea Locatelli, Michele Marieschi, Jacopo Palma, Giovanni Paolo Panini, Marco Ricci, Sebastiano Ricci, Salvator Rosa, Francesco Simonini, Giovanni Battista Tiepolo, Giovanni Domenico Tiepolo, Giuseppe Zais, Francesco Zuccarelli

Dutch old masters
Ludolf Bakhuysen, Abraham Bloemaert, Pieter Claesz, Joost Cornelisz Droochsloot, Egbert van Heemskerk, Thomas Heeremans, Jan van Goyen, Melchior de Hondecoeter, Jan van Huchtenburgh, Jan van Huysum, Nicolas Maes, Jan Miense Molenaer, Klaes Molenaer, Pieter Molyn, Caspar Netscher, Adriaen van Ostade, Antonie Palamedes, Salomon van Ruysdael, Cornelis Saftleven, Herman Saftleven, Jan Steen, Abraham Storck, Willem van de Velde (jnr), Philips Wouwerman, Jan Wynants

French old masters
Louis Leopold Boilly, Francois Boucher, Jacques-Louis David, Jean Honore Fragonard, Theodore Gericault, Jean-Baptiste Greuze, Jean Baptiste Huet, Nicolas Lancret, Nicolas de Largilliere, Carle van Loo, Jean Baptiste Monnoyer, Charles-Joseph Natoire, Jean Marc Nattier, Jean Baptiste Oudry, Jean Baptiste Pater, Jean Pillement, Hubert Robert, Joseph Vernet, Marie Louise Elisabeth Vigee-Lebrun, Jean Antoine Watteau

Old masters
Francois Boucher, Canaletto, Pieter Claesz, Jean Honore Fragonard, Thomas Gainsborough, Jan van Goyen, Jean-Baptiste Greuze, Francesco Guardi, Jan van Kessel, Nicolas de Largilliere, Sir Peter Lely, Nicolaes Maes, Michele Marieschi, Ben Marshall, Sir Joshua Reynolds, Hubert Robert, Salomon van Ruysdael, Abraham Storck, David (younger) Teniers, Giovanni Battista Tiepolo

Modern European painting
Pierre Bonnard, Georges Braque, Marc Chagall, Kees van Dongen, Moise Kisling, Marie Lauren£in, Pablo Picasso, Georges Rouault, Maurice Utrillo, Edouard Vuillard

Contemporary painters
Georg Baselitz, Jean Michel Basquiat, Jean Charles Blais, Sandro Chia, Francesco Clemente, Keith Haring, Mimmo Paladino, A R Penck, Sigmar Polke, Antonio Tapies

Art-100 index (pictures in general)
Pierre Alechinsky, Helen Allingham, Michael Ancher, Karel Appel, Georg Baselitz, Jean Michel Basquiat, Albert Bierstadt, Pierre Bonnard, Fernando Botero, Eugene Boudin, Arthur Merric Bloomfield Boyd, Georges Braque, Bernard Buffet, Marc Chagall, Sandro Chia, Giorgio de Chirico, Jean Baptiste Camille Corot, Gustave Courbet, Salvador Dali, Montague Dawson, Otto Dix, Jean Dubuffet, Max Ernst, Henri Fantin-Latour, Lyonel Feininger, Lucio Fontana, Myles Birket Foster, Sam Francis, Atkinson Grimshaw, Keith Haring, Henri Harpignies, Childe Hassam, Paul-Cesar Helleu, John Frederick (snr) Herring, Ferdinand Hodler, Antonio Jacobsen, Johan-Laurents Jensen, Johan Barthold Jongkind, Asger Jorn, Ernst Ludwig Kirchner, Moise Kisling, Paul Klee, Gustav Klimt, Willem Koekkoek, Oskar Kokoschka, Willem de Kooning, Carl Larsson, Marie Laurencin, Fernand Leger, Bruno Liljefors, Rene Magritte, Henri Matisse, Joan Miro, Claude Monet, Giorgio Morandi, Sir Alfred Munnings, Emil Nolde, A R Penck, Pablo Picasso, Serge Poliakoff, Pierre Auguste Renoir, Jean-Paul Riopelle, Diego Rivera, Gino Severini, Dorothea Sharp, Leon Spilliaert, Carl Spitzweg, Alfred Stevens, Antonio Tapies, Fritz Thaulow, Archibald Thorburn, Maurice Utrillo, Louis Valtat, Edouard Vuillard, Andy Warhol, Tom Wesselmann, Jack Butler Yeats, Anders Zorn, Francois Boucher, Canaletto, Pieter Claesz, Jean Honore Fragonard, Thomas Gainsborough, Jan van Goyen, Jean-Baptiste Greuze, Francesco Guardi, Jan van Kessel, Nicolas de Largilliere, Sir Peter Lely, Nicolaes Maes, Michele Marieschi, Ben Marshall, Sir Joshua Reynolds, Hubert Robert, Salomon van Ruysdael, Abraham Storck, David (younger) Teniers, Giovanni Battista Tiepolo, Sir Lawrence Alma-Tadema, Sir Edward Coley Burne-Jones, John William Godward, Lord Frederic Leighton, Sir John Everett Millais, Dante Gabriel Rossetti, Marcus Stone, James Jacques Joseph Tissot

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