

# Rising Stars, Superstars and Dying Stars: Hedonic Explorations of Autograph Prices

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**Abstract:** Key studies have explored the economics of rising stars, superstars and 'has beens', but relatively little economic literature exists on the associated parallel memorabilia markets. Using a random sample of 1151 pieces of autographed artefacts, on sale through a retail and internet outlet, hedonic analysis is undertaken to elicit significant characteristics in price determination. The data principally consists of autographs of past and current cultural icons along with some sporting and historical figures. We explore, *inter alia*, price differences with respect to 'dead' or 'alive' signatories, gender, sphere of fame, nationality, the age of the signatory and the nature of the artefact on which the signature is written. Alternative model specifications have been explored and compared. A notable difference emerges between those autographs with photographs and those without. There are also differences in prices according to whether individuals had been famous for their roles in just films, just television, or in both.

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## I. INTRODUCTION

The Concise Oxford Dictionary defines an autograph as “a person’s own handwriting, esp. signature”. Autographs have been collected and traded for many years with the origins of autograph collections believed to date back to German scholars of the 16<sup>th</sup> century (Rare Book School 2006). Originally these were collected for networking purposes, as letters of introduction as the scholars travelled around Europe (*Wanderjahren*). Towards the end of the 19<sup>th</sup> century, autograph collection grew as a leisure pursuit with the motivation being to preserve the past or as an outward sign of social status. However, it was not until the 1920’s that a major shift took place in the focus of the collector. Demand for autographs increased not only for the earlier historical signatures but also for living and popular (and unpopular) persons, raised to public profile through the media revolution of the twentieth century. Autographs were signed deliberately on flyleaves of books, and on photographs to promote films, concerts, books and the like. Other reasons for collecting autographs, such as teenage idolism, began to appear.

The current market for the trading of autographs is highly contestible. Page after page of internet listings of sites offering to trade in autographs can be found from a simple search. The fragmented nature of the market makes estimating a total market size problematic although the US State Department did estimate that in 2000, the US market for sports and celebrity memorabilia amounted to \$1 Billion p.a.. The fragmented nature also makes authenticity a major concern. Of the \$1Billion, it was estimated that more than 50% (and as much as 90%) was trade in counterfeit goods. As such, in our analysis we restrict ourselves to the use of data from Fraser’s Autographs ([www.frasersautographs.com](http://www.frasersautographs.com)), a significant seller in the UK market, holding certificated authenticity.

This paper is organised as follows. The next section considers the application of an economic approach to analysing the autograph market. Data issues and the methodology are considered in Sections 3 and 4. The results are presented and examined in the following two Sections teasing out the distinction between autographs with and without photographs. Some concluding remarks are offered in the final section.

## II. AN ECONOMIC APPROACH TO ANALYSING THE MARKET FOR AUTOGRAPHS

On the demand side, individuals who enter the market for autographs do so for a variety of reasons – they may imagine that they are a good investment, they may just have an ‘obsession’ with a particular star, or they may be interested in a particular period of film or other history and see autographs as a way of bringing that era ‘back to life’. Autographs make suitable gifts and the market has been stimulated by the ease with which autographs can be bought over the internet, rather than via speciality auctioneers.

In common with the markets for other ‘collectables’ and memorabilia such as postage stamps, antique furniture, Persian vases and vintage cars, the market for autographs is characterised by an element of uniqueness in that many of the items are irreplaceable. This is clearly even more the case for signatories who have died. Furthermore, an autograph provided when the signatory is in the early stages of their career may or may not be regarded as a perfect substitute for one given at the end of their career. This will depend on the preferences of the collector. In other words, certain characteristics may be regarded as largely irrelevant when speaking of the

market for autographs. Some, however, will not. Thus the condition of the autograph may be important, as well as whether it is signed on a manuscript, letter, photograph or just a piece of paper.

In addition to the characteristics of the autograph itself, the characteristics of the signatory are likely to influence demand. It might be expected that autographs of those who have achieved certain levels of popularity would be more highly sought after than those of individuals known only in a local geographical area. Those who have achieved fame in certain areas of activity (eg politics) may be less in demand. The age of the autographs, notwithstanding its condition, may also be relevant. It is these general characteristics that we are interested in, rather than the factors influencing demand for a particular person's autographs. Thus, in this paper, the market for autographs is used in a broad sense, where the demand is based on broad features, rather than solely on the specific personality.

The hedonic pricing approach followed below enables us to elicit which characteristics of signatories are most valued by collectors. Hedonic pricing was first introduced by Kelvin Lancaster (Lancaster, 1966). The general approach is straightforward and is widely used in price indices adjustment (see, for example, Silver and Heravi, 2004 and 2005), and, more relevantly here, to explorations of a product's price as determined by its characteristics. Given the generalisability of its theoretical underpinning it is not surprising that hedonic pricing has been applied in many product groupings including extensive use in environmental valuation. Hedonic pricing has even found its way into cyberspace (Castronova, 2003). As is usual in this approach, the overall supply of the commodity in question is largely ignored, which seems to fly in the face of basic economics, where a fundamental principle is that prices are determined by both supply and demand. Surely, the argument goes, the number of autographs that an individual signs will influence their market value? In the extreme, if Paul McCartney only ever signed one autograph, it would be worth million of pounds. This would doubtless have been the case if true, but in practice all people whose signatures are collected have tended to sign innumerable documents and photographs, each with a variety of characteristics, but many of which are either indistinguishable (eg book signings) or where the variations are not regarded as relevant (eg a signature in 1965 by Sir Cliff Richard written in the form "With best wishes to Claire" compared to one saying "With best wishes to Susan"). As far as the determinants of price are concerned, it is the variations in important characteristics of the autographs or in the characteristics of the signatory that are of interest. More specifically, if we consider the market for autographs of one particular person, then it is clear that supply and demand do play their usual parts. For example, suppose romantic fiction author A only signed a small number of autographs in his/her time, compared to author B, who signed innumerable copies of their detective novels. If all other characteristics of the autograph and the authors (i.e. the demand) were comparable, then due to supply differences, one might expect that author A's autographs fetched a higher price. However, if we depart slightly from these assumptions and suppose that author B's work was much more highly regarded and 'collectable' (i.e demand was different), then it is quite conceivable that the situation be reversed. Thus when considering the market for autographs of *a single person*, both supply and demand are relevant.

In contrast, in the characteristics approach, we are not be concerned with the name of the author, only the fact that they are an author. Thus the demand curve is not for the autographs of person A but for autographs as a whole, each with different combinations of characteristics. Similarly, the supply relates to the total supply of autographs of signatories with particular characteristics, of which we assume there is a considerable but fixed number. To be able to estimate how prices are determined, our sample would require a set of "authors",

“actors”, “sports personalities” etc., if these are the characteristics believed to cause variations in prices. We note that there are no variables which might directly be used in determining whether an individual author is one who is highly regarded or one who is viewed less favourably - if there were, then this would be the secret of success in writing a best-selling book! This leads to a highly stochastic element in autograph prices. However, low supply of signatures of any one particular author should not pose any estimation bias, provided there are a sufficient number of other autographs/authors with the same characteristics.

### III. DATA

Data on a sample of autograph prices and characteristics were collected from a randomly chosen mail order catalogue (No. 134) of the UK’s market leader in autograph trading, Fraser’s Autographs. The company claims to hold over 60,000 items of signed memorabilia in stock and purchases can be made through a mail order catalogue, through personal visits or via their website ([www.frasersautographs.com](http://www.frasersautographs.com)). Valuations are conducted by Fraser’s specialists and the prices observed for each item are those at a fixed point in time with prices being reduced if items are not sold. Thus a “superb, 10x8in full-length, colour (landscape) photograph of Eric Cantona and David Beckham pictured together on the pitch for Manchester United” was recorded at the point of data collection to be on sale for £350. Four months later, the same autographed photo was available on Fraser’s internet site at £270. Information was not available on how long any item had been for sale, but we can assume that the price recorded would be the highest price for which it might sell. Some will be sold for lower prices than those advertised, either through Fraser’s auctions, or by offering for sale at a lower price. However, we must assume that Fraser’s team of expert valuers are making the best estimate they can of what consumers are willing to pay for each item, since there are costs in holding stock and in re-advertising at a different price. At the very least, we are measuring the variations in prices that the valuers attribute to various characteristics. In terms of consumer valuation, then this is the best we can do without knowing the final sale price.

Having collected the price of the autograph and the name of the signatory, information was collected on the type of artefact. This was essentially one of three types. First, a signed photograph, (eg “A charming, 3/4 length, black and white (sepia toned) postcard photograph (approx 3.5x5.5 in) of Elvis, pictured holding a flick knife. The piece is signed across the left portion of the image in blue biro pen ink. A fantastic item in excellent condition.”).<sup>1</sup> Secondly, some items were just signatures on a piece of paper such as that of David Hockney, described as “A blue page signed in bold green ink by the distinguished British artist associated with the Pop Art movement”. Finally, there is a half-way house between these two, which comprise a photograph and a separate signature, frequently combined and mounted together in a frame (eg “A small, light orange, album page (approx 1x1.5in) signed in black biro ink by the English born poet, who is widely considered among the greatest literary figures of the 20th Century. The piece is mounted, framed and glazed together with a photograph of the poet”). In this group, the autograph that accompanied the photograph typically occurred in a book, album or other type of document. In addition, information was collected on whether the signature was framed.

Various characteristics of the signatory which were thought might influence price were sought from other sources (primarily by typing the person’s name into an internet search engine). Firstly, data on the person’s sex, date of birth and whether they were still living were collected. One might expect that in line with many other

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<sup>1</sup> Some items were described as photographs, yet were really documents such as sheet music on which were pictures of the signatory. These were recorded as being “documents” and not photographs.

historical artefacts, the price of the signature would be related to its age, all other things being equal. Of course this may partly be due to scarcity value, although there were very few in our sample emanating from the pre-Victorian age, and the earliest autograph was of Sir Walter Raleigh (1552-1618). It could also be true that, like furniture, autographs from various ages of history go through phases of popularity. The actual age of the autograph was not available, and although it might have been possible to guess this from the photographs, where available, the date of birth of the person was used as a form of proxy.<sup>2</sup> We might note that although a person's signature may change over the years, it would prove difficult to date an autograph directly from the handwriting, and that photographs can be signed some years after they were taken. Birth dates cannot be forged. Also recorded was whether the person was still alive or not. This might influence price in at least two ways – if they are no longer alive, then owners of the autograph can be sure that the market will not be swamped by the signatory issuing more autographs and may be confident in their autograph retaining its value, even if that is not the main reason for obtaining it. For those who are still alive, autograph collectors might indulge in some speculation that they are obtaining an autograph of someone who will in future rise to great stardom and that the autograph at an early stage in the person's career may prove more valuable than one at a later date (our data does not permit investigation of this hypothesis). On the other hand, those at an early stage in their careers may just as easily not achieve great stardom or may soon fall out of popularity. Soap personalities frequently disappear from the public eye as their careers move in other directions. For those who have died, their claim to fame (or infamy) has been established and the general public view on this is less likely to change over time.<sup>3</sup> In summary, if autograph price is related to fame, then where fame is undecided the price may be lower.

Secondly, the “area of business” in which the signatory achieved their fame or recognition was examined and one or more of the following categories was recorded – films, television, sport, music or politics. There are no *a priori* expectations as to whether one group or another might be more highly valued, but differences could certainly exist. A further subdivision within the visual arts was made by discriminating between personalities who had achieved fame just in the films (such as Lauren Bacall), just in television (Mike Farrell of M\*A\*S\*H) or, most commonly, those who had achieved success in both media (David Schwimmer). Those who were successful in just one area may be regarded in lower esteem than others (although this will not apply to stars who lived before the age of television)<sup>4</sup>. Where possible, some attempt was made to discriminate between significance of achievements and levels of fame. Thus, as appropriate, the number of Emmys won, the number of Oscars won, the number of UK top-10 albums made and the number of Olympic medals won was recorded.

Finally, in order to test whether the nationality of the star was important, each signatory was recorded as being either US, UK or neither of these.<sup>5</sup>

Data were collected on 1151 separately itemised autographs, with asking prices ranging from £40,000 for a book signed by J K Rowling, down to £10 for a group photograph signed by players of Ipswich Town Football Club. In exploring the determinants of price, an initial problem is how to make allowances for autographs which

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<sup>2</sup> As noted below, group autographs were excluded from the sample, so there were no problems arising from multiple dates of birth.

<sup>3</sup> There may be exceptions to this when discoveries are made about a person's influence on events that were not previously known.

<sup>4</sup> Consistency was achieved by the coding for these classifications being undertaken by the same research assistant using the same websites (such as: <http://en.wikipedia.org> ) for each signatory.

<sup>5</sup> Some data was also obtained on the size/area of photographs, but this was missing from a very high number of data points. Although this is more likely to occur in smaller photographs, this data was not used on the basis that it was incomplete.

have more than one signature, frequently occurring with rock/pop bands. It is unlikely to be the case that a photograph with 3 signatures is 3 times as valuable as a photograph of one person. Yet in many ways there could be a premium to be paid when several linked autographs are collected together on a single artefact. Data on the number of people in a photograph were not consistently available and the subsequent analysis thus concentrates only on single-person autographs. The sample was also reduced by eliminating those “autographs” of fictional characters such as “Postman Pat” and instances where the signatory could not be clearly identified. The total sample size available for analysis was thus reduced to 987.

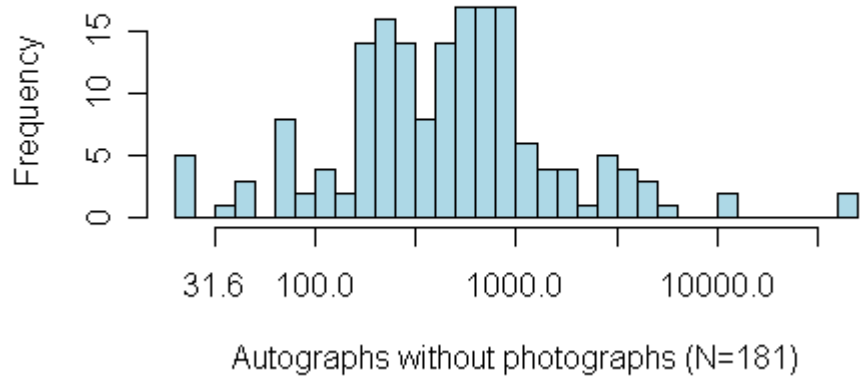
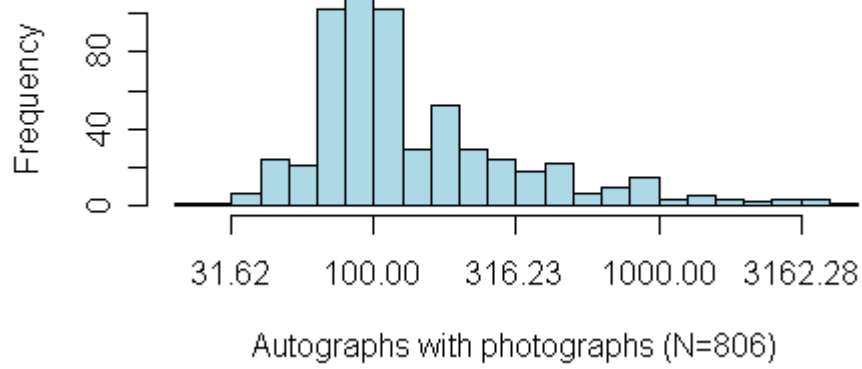
This was split into 2 categories – those where there was a photograph (806) and those where there was no photograph (181). Whilst it might conceivably be possible to treat these as comparable artefacts, the characteristics of an autographed photograph (either with the signature on the photograph itself or on an attached mount) are likely to make such artefacts a different ‘product’ to autographs where there is no photograph. There may also be related factors, such as age which determine why the signature was not on a photograph, and these would interfere with the influence of the price-determining factors. The distributions of prices for each group is shown in Figure 1, where the highly skewed nature of the data can be observed. Table 1 provides key statistics.

There are obvious differences between the two groups. In general, autographs without photographs are considerably more expensive. This might seem perverse, but a possible explanation is the greater age of these autographs – some of which stem from the days before the invention of photography and include such persons as Oliver Cromwell, Napoleon Bonaparte and Mark Twain – although there was a photograph of Abraham Lincoln, born 1861, for sale. Autographs with photographs are more likely to be from personalities from film, television or music (some may be in more than one of these categories), with just 66 of the 806 unable to be classified into any of these 3 categories. This compares with 80 of the 181 no-photo autographs which cannot be so classified. These “non-classifiables” cover a wide mixture of backgrounds, including such individuals as Neil Armstrong, Thomas Edison, Arthur Conan Doyle, Claude Monet and Mother Theresa, although not all are as well known as these examples. Whilst it might have been possible to devise further classifications such as “painters” and “writers”, these were left as one base category for comparison with all the other groups.

Some signatories appeared more than once in the sample. At one extreme, there were 7 signed photographs of David Bowie, priced at £112.50, £200, £200, £225, £250, £290 and £300. In terms of the data collected, there were no differences in these 7 artefacts apart from the price. In practice, these differences may have been due to the quality, size and/or date of the photograph, the length of time the item has been on sale, etc. Alternatively or in addition, these valuations may just be subject to some random fluctuation around a mean level, attributable to the price-setters experience and knowledge of the market, which might be viewed as a form of measurement error. In terms of helping to explain the variations in prices of autographed photos, rather than the prices of autographs for particular individuals, repeated and identical observations would seem irrelevant. This argument seems particularly valid given that the sample of autographs is not random and that the observations are not independent, either where they are of the same person or where a valuer is a specialist in setting the prices of the autographs of certain individuals. On the other hand, a repeat observation provides information about the extent of variability of the prices perhaps assisting in finding out more confidently which factors are important in the

determination of autograph prices. Results reported here are for a reduced sample (N= 849, of which 673 were with photographs and 176 without) where exact duplicates have been removed.<sup>6</sup>

**Fig. 1 - Autograph prices (£) (log scale)**



<sup>6</sup> Autographs priced differently for the same signatory remained in the sample.

**Table 1. Key variables – Basic Statistics**

	Autographs with photographs	Autographs without photographs
Mean price of autograph (£)	239.76	1313.38
Median price of autograph (£)	125.00	475.00
Standard deviation of price (£)	458.39	4393.37
Mean birth year of signatory	1946.27	1901.32
Standard deviation of birth year	72.87	60.28
Percentage still alive	84.3	37.2
Percentage of males	52.2	78.5
Percentage born in USA	57.2	33.3
Percentage born in UK	25.8	41.1
Percentage who have an Oscar	14.3	14.9
Percentage who have an Emmy	2.2	0
Percentage famous in SPORT	3.6	7.7
Percentage famous in FILM only	39.9	23.3
Percentage famous in TV only	4.8	6.7
Percentage famous in TV + FILM	19.4	7.8
Percentage famous in MUSIC	32.0	16.0
<b>SAMPLE SIZE</b>	<b>806</b>	<b>181</b>

#### IV. METHODOLOGY

The general hedonic pricing approach was used, whereby a number of explanatory variables were regressed on the dependent variable, price. However, because of the highly skewed nature of the dependent variable, particular attention was paid to the functional form and to confirming the stability of the results.

There is no *a priori* argument to suggest why the relationship between the explanatory variables and price should be linear and the Box-Cox transformation (Box and Cox, 1964) is convenient for investigating alternatives. It is a common transformation in hedonic pricing analysis and is given by:

$$P^{(\lambda)} = \frac{P^\lambda - 1}{\lambda}$$

where P is the price of the autograph. The parameter  $\lambda$  lies between -1 and 1 inclusive. Values of  $\lambda$  equal to 0 and 1 result in log and linear values of P respectively. A value equal to -1 transforms P to 1/P, with all other values of  $\lambda$  allowing other non-linear relationships. The Box-Cox transformation can equally be applied to exogenous variables greater than zero (either with the same or different values of  $\lambda$ ), but we concentrate here on estimating one suitable value of  $\lambda$  for transforming P. Such a transformation is also appropriate to counter the non-normality and non-constant variance of the error term which results from the highly skewed price data.

Although some of the characteristics of the signatory may influence price in a simple add/subtract fashion, it is quite possible that the effect on price of, for example, the signatory still being alive, is more complex than this. Thus it is quite possible that if a sports personality is no longer alive, this will have a different impact on the price of an autograph than if it is an artist or film-star who has died. This was allowed for by including interactive dummies of each characteristic with whether the signatory was still alive. This approach was also followed for year of birth, so that the effect of the year of birth of each signatory was allowed to vary differently according to the personality's type of business. Finally, these interactive effects were combined to allow the



year of birth influence on price to vary according to *combinations* of being alive or not and of area of business.<sup>7</sup> Because of the possible complexity due to these interaction effects, it is difficult to discern the nature of the relationships to the dependent variable by a simple inspection of coefficients. We therefore undertake a simple simulation of the model to examine how price varies with birth-year, holding other variables constant, for a range of scenarios. Plotting the result allows us to compare the nature and depth of any such relationships.

Maximum likelihood estimation of the Box-Cox model provided estimates of  $\lambda$  and other coefficients, as well as standard errors. Various diagnostic issues with the data were handled in different ways. Firstly, some confirmation of the standard errors was achieved by estimating the model using OLS, having transformed the dependent variable using the m.l. estimator of  $\lambda$ . The residuals from this regression were also then tested for normality. Secondly, some of the variables, especially amongst the interactive terms, displayed high collinearity. Thus amongst the sample of autographs with photographs, the correlation between the dummy for being a 'tv-only' personality and the 'tv-only, alive and birth-year' variable was 0.99954, since just about all those in the 'tv-only' category are still alive. This variable was dropped as necessary. Thirdly, it was thought that some bias might still creep in, due to the highly skewed nature of the data, even after Box-Cox transformations. Although the normal procedure would be to use all the data available, a sensitivity analysis was thus conducted to examine the effects of removing the autographs fetching the highest and the lowest prices and the Cook's distance statistic was also calculated to examine whether particular observations were having an exceptional influence on the model estimates. In this way, we have confidence in the robustness of our estimates.

## V. RESULTS: AUTOGRAPHS WITH PHOTOGRAPHS

Table 2 presents the sensitivity analysis of the Box-Cox maximum likelihood model for autographs with photos. Observations were dropped for estimation at both the low and the top end.<sup>8</sup> There is reasonable consistency between models in terms of identifying significant coefficients<sup>9</sup>, but not complete agreement. There is clearly a trade-off between removing the extreme observations at either end of the price spectrum so as to gain a more normally distributed set of residuals (as revealed in the tests of normality undertaken) and between losing the information contained in those extremes. For subsequent analysis in this paper, we err on the cautious side and where appropriate comment on the results of the model which excludes prices of under £50 and of £1500 and above. We recognise that the systematic removal of 39 of the 656 observations may have introduced some bias, but hope we have gained in terms of robustness of results and more reliable significance tests.

In terms of the artefact itself, the inclusion of the photograph within a frame adds value to the autograph. There is also a premium attached to photographs of persons born outside the US/UK, perhaps suggesting that English-speaking purchasers of autographs find these a little out of the ordinary or it could be that there has to be that something 'extra' about foreign personalities for their signatures to find their way into the UK market.

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<sup>7</sup> Obviously the effect of birth year on price *for those who are alive* cannot be perfectly linear (whether declining or increasing), since there can be no such effect at all for those born before 1900, say. However, although this might be a theoretical discontinuity, there is no need to allow for this explicitly in our model since there are no sample members displaying this combination and we take care not to make any such extrapolations.

<sup>8</sup> Three observations with a Cook's distance value of more than 0.5 were also removed.

<sup>9</sup> The sizes of the coefficients are affected by the estimate of  $\lambda$  and cannot be directly compared.

In the determination of autograph prices, some types of person were never significantly different to the base-line general case of someone who is NOT in sport, films or television. These included those who had won an Olympic medal and (results not reported here) won an Oscar, won an Emmy, or was/is a politician or a football personality (as distinct from sport in general). Having a string of UK Top-10 albums adds to the price, but not by a large margin – thus for example, a 1960-born UK male musician who is still alive would have a predicted autograph price of £121 with 5 albums to his name, but this would only increase to £158 with 20 albums. Clearly, it takes more than just having top albums to your name to warrant very high autograph prices.

The influence of the birth-year of the signatory and whether they were still alive is difficult to discern directly from an examination of the regression coefficients, although these variables are clearly significant. There are also differences in prices according to whether individuals had been famous for their roles in just films, just television or in both. To gauge the extent to which these differences contribute to variations in price, a simulation was conducted to predict autograph prices for a variety of scenarios, examining the link with birth date. These are presented in Figures 2(a) and 2(b) for persons alive and no longer alive respectively. Various factors were held constant in each scenario - the autograph was not in a frame, was not separate from the photo, the signatory was born in the US or UK and had no UK top-10 albums. Care should be taken not to extrapolate too far, since confidence intervals are likely to be large for scenarios where the effective sample size was small.

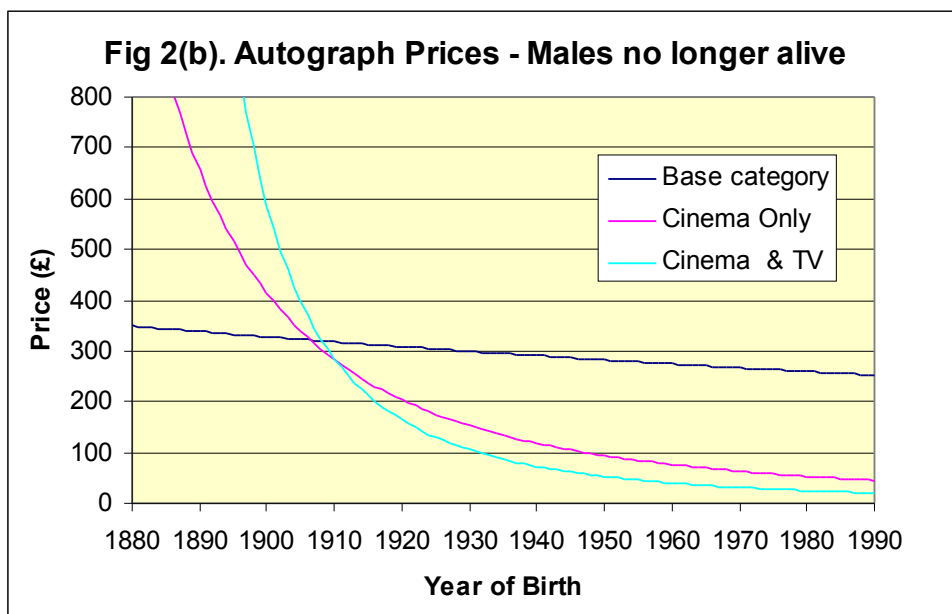
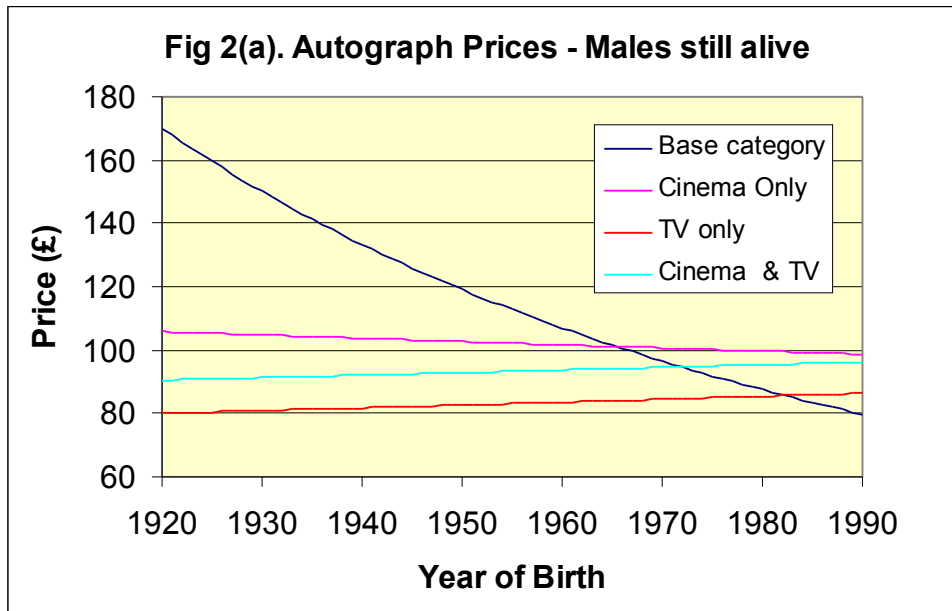
Examining the market for autographs for living persons first, then from Figure 2(a) although there is a market for autographs of stars of film and television, these autographs appear much less in demand (and attract a lower price on average) than autographs of other personalities. Most personalities on television and film are well-known and attract their own fans, but not in significant numbers to fetch high prices on average. Personalities from other backgrounds, such as artists and the literary world can command some 40-50% higher prices, the exact amount depending on the age of the artist, with older artists and authors fetching greater amounts. Amongst personalities from the visual arts, then those who have only appeared on film are valued a little more highly than those (perhaps of lesser talent, but certainly less well known internationally) who have appeared only on television. Those who appeared in both media had prices in the middle. It would seem that the traditions of starring in the cinema, and the desire not to cross over or do TV work, are regarded as a positive feature. For living persons, the profiles for females were not notably different from males.

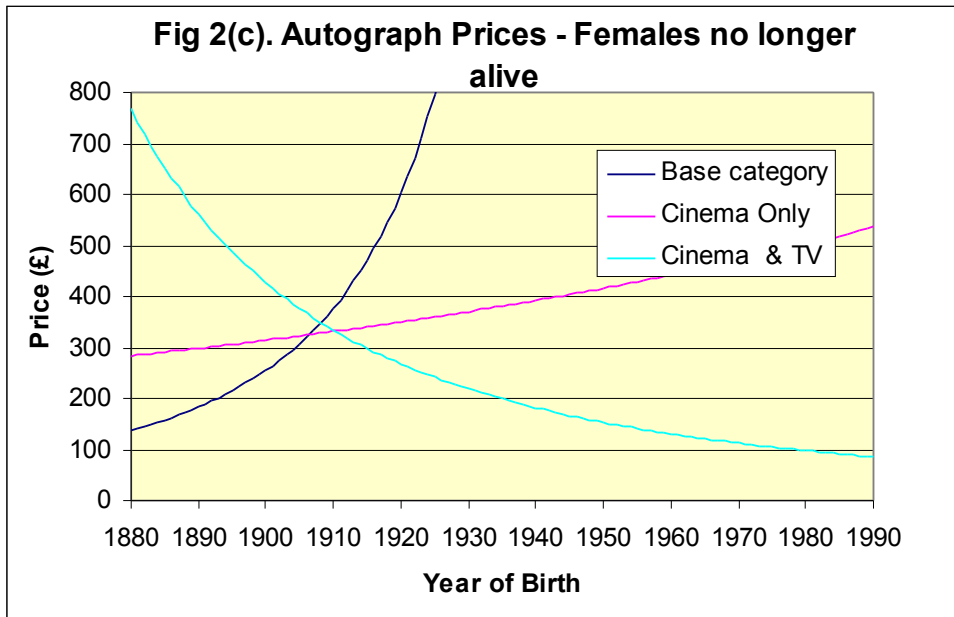
For persons no longer living, we repeated the scenarios, excepting removal of the category of TV only (there being so few persons in this group) but adding a separate graph (Figure 2(c)) for females, as there appears to be a notable difference to males.<sup>10</sup> The earliest birth date has been put back to 1880, as this is now feasible. It is as well to remind ourselves that only 16% of signatories in the sample of autographs with photographs were dead, so we should exercise caution in interpreting the graphs. Having said that, in comparison with Figure 2(a), autographs of persons no longer alive fetch a much higher price than those of persons still living. This price rises the earlier the year of birth, climbing dramatically for males of the silver screen, whether or not they have also been TV stars. However, for this group the rise from the level of £100 only ‘kicks in’ for those born before 1940. In contrast, for males who have achieved fame via other means (authors, artists etc – the base category), then the climb in price is not as steep but is around the £300 mark even for those born in the 1940’s. This distinction between the 2 types of autographs – TV/Film stars and all the others – is interesting. It is likely that for stars in the latter category, then the death of the star immediately hikes up the price of the autograph, but that

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<sup>10</sup> There were only 22 dead females with photos in the sample.

in the other group, there is a lag before the autograph becomes a collector's prized item. For females, the picture is a little more confusing, with the suggestion for those in the base category and for those film stars who have never been on TV that autograph prices actually *fall* the earlier the year of birth of the signatory. This raises the possibility that females born in the nineteenth century are of less appeal to autograph collectors, but may simply be due to small sample fluctuations. On the other hand, for the majority of females born after 1910 who have died, the price of their autograph is considerably higher than for a comparable male.





## VI. RESULTS: AUTOGRAPHS WITHOUT PHOTOGRAPHS

These autographs have a much higher and more varied price range and comprise a large majority of persons no longer alive. Consequently, the average age of these autographs is much greater. Unfortunately, the smaller sample size does not allow as full an estimation procedure as when there are photographs due to high multicollinearity between variables (notably the interactive terms involving ALIVE \* BYEAR). Such variables were omitted, as also was 'Films + TV' and Olympic medallist category, there being very few in this sample. A variable was however included to cover instances where the autograph appeared in a book. One might expect these to fetch higher prices. Overall, the degree of skewness in this sample is much lower and removal of only the 5 highest-priced autographs (all those over £5000) allowed us to achieve normality in the residuals<sup>11</sup>. The results of the Box-Cox estimation are presented in Table 3.

In general, the degree to which these variables explain the variation in prices is lower (adjusted R-squared of 0.28) than for autographs with photos and there are only a few significant variables. The Box-Cox estimation yielded a value of  $\lambda$  which was not significantly different from zero, equivalent to a model with a log transformation of the dependent variable. Thus an OLS approach was also used, for comparative purposes, and these results are alongside. As in the earlier sample, framing an autograph adds to its value (the coefficient value shows this as approximately doubling to tripling its price). For musicians, the number of UK top-10 albums was again a significant variable.

Looking at the distinction between those living and those who have died, the model predicts that in general, the former's price to be around half of the latter's, consistent with the earlier finding. However, there is a suggestion that *sportsmen and women* still living go against this trend and have a higher-priced autograph – perhaps sports personalities disappear from people's memories once they have died and their autographs (at least without a picture) drop in value. Further, and this appears to be true for any type of personality, when there is no photograph, the birth year of the personality plays no part in its price. This is an interesting contrast to the earlier

<sup>11</sup> These 5 autographs were priced as follows: 2 at £40,000 (Paul McCartney, J K Rowling), 2 at £12,500 (Sir Walter Raleigh, Frank James) and 1 at £5,750 (Marilyn Monroe).

finding and is consistent with the view that if there is no photograph, then it does not matter whether the signatory was born 150 or 100 years ago, only that they are dead. Unlike sheets of paper, photographs from the earliest years have intrinsic value as photographic items and, as they get older, rise in value due to the rarity of photographic items from this age. This does not apply to autographs solely on pieces of paper.

The comparatively low degree of explanation of this non-photographic sample is interesting and can only partly be due to the higher mean level of prices observed for this type of artefact. There is certainly something different which warrants its separate treatment and the reason for this and the much wider variation in prices needs comment. There may be an element of a 'sample selection' effect, in that there is more natural variety in this sample, comprising many more who are no longer around, including an array of historical and literary figures from a time when photographs were non-existent or the custom of signing them was comparatively rare. Also, persons who collect autographs without photographs may collect them for a different reason than those who purchase the photographic variety. Or it may have something to do with the many ways of signing an autograph – perhaps the content and number of words written is important here, when a signature on a photograph leaves much less room for variation in style. This detailed level of information was not available to us. There may also be a range of other characteristics pertaining to prices of autographs without photographs which we have not observed and which display a much greater degree of variation than autographs with photographs.

The other related possibility is simply that the value of autographs without photographs is much more determined by the 'star-quality' of the signatory and the place they have taken up in history (whether a literary, historical figure or whatever). Would any sort of categorisation predict that the non-photograph autograph of Louis Pasteur would fetch £1750 compared to the non-photograph autograph of William Wordsworth on sale for £775? It is only when the autograph is on a photograph that the background, sex or precise age of the signatory/signature becomes relevant, even if the signatory was from an age where photographs existed. Without the photograph it is only the signature which is being collected and it makes no difference how attractive the person is/was or whether they were a film/TV star or an eminent writer – it is just how 'famous' they were.

Every individual who might collect autographs has their own personal idea of a 'pecking order' of famous individuals in terms of the price they may be willing to pay for an autograph. Much of this will be down to personal preference. However, once a categorisation into 'dead' or 'alive' has been made, there is no completely reliable and systematic way to determine which autographs are sought after and which are not, apart from knowing who the signatory is. For autographs on photographs, there are some other factors which may help, but where the autograph is not on a photograph, the variation according to personality is much greater.

## VII. CONCLUDING REMARKS

This study presents the first hedonic analysis of the autograph market. The observations contained in the assembled dataset principally consist of autographs of past and current cultural icons along with some sporting and historical figures. This is a logical application to a hitherto under-researched cultural market. The paper also provides an account of the market characteristics for this body of 'collectables', which displays some commonality with other markets, such as those for postage stamps, fine art, or antique furniture. Additionally, this study casts an interesting empirical sidelight on the nature and durability of celebrity and fame via price

information in a complementary market. Coding and methodological issues are raised and considered with a view to helping frame current and future work analysing data from this and similar markets elsewhere around the globe.

The results indicate, *inter alia*, price differences with respect to ‘dead’ or ‘alive’ signatories, gender, sphere of fame, nationality, the age of the signatory and the nature of the artefact on which the signature is written. Alternative model specifications have been explored and compared. A notable difference emerges between those autographs with photographs and those without and the results for these two categories of observations are discussed in detail separately. Of particular note is the fact that there are also differences in prices according to whether individuals had been famous for their roles in just films, just television, or in both.

## BIBLIOGRAPHY

Box, G. E. P. and Cox, D. R., 1964, “An Analysis of Transformations”, *Journal of the Royal Statistical Society*, 211-243, discussion 244-252

Castranova, E., 2003, “The Price of ‘Man’ and ‘Woman’: A Hedonic Pricing Model of Avatar Attributes in a Synthetic World”, CESifo Working Paper Series No. 957

Lancaster, K.J., 1966, A New Approach to Consumer Theory, *Journal of Political Economy*, 74, 132-157

RBS, Rare Book School, University of Virginia, <http://www.virginia.edu/oldbooks/exhibitions/autographs.shtml> (accessed 6/2/06)

Silver M and Heravi S, (2004), “Hedonic price indexes and the matched models approach: a comparison of different methods of adjusting for quality when measuring the price changes of durables”, *The Manchester School*, 72, 1, 24-49

Silver M and Heravi S, (2005), “A failure in the measurement of inflation: results from a hedonic and matched experiment using scanner data.”, *Journal of Business and Economic Statistics*, 23, 3, 269-281

US State Department **U.S. Department of Justice** *United States Attorney, Southern District of California* <http://www.cybercrime.gov/sports.htm> (accessed 6/2/06)

Table 2. Box-Cox Nonlinear Regression Model. Autographs with photos.  
(a) Effect of eliminating highly priced autographs

Sample criteria:		All sample			Price < 3000			Price < 1500		
Sample size:		656			652			636		
Variable		Coefficient	P-Value	Sig.	Coefficient	P-Value	Sig.	Coefficient	P-Value	Sig.
<b>Characteristics of artefact</b>										
Autograph is framed	FRAMED	0.1650	0.0002 ***		0.1618	0.0004 ***		0.1298	0.0126 **	
Autograph is separate from photo	SEPPHOTO	0.0312	0.2033		0.0311	0.2331		0.0235	0.4857	
<b>Characteristics of signatory</b>										
Signatory born outside US/UK	NONUSUK	0.0337	0.0207 **		0.0369	0.0176 **		0.0440	0.0249 **	
No. of UK top 10 albums†	NUMUKALB	0.0064	0.0001 ***		0.0062	0.0003 ***		0.0068	0.0020 ***	
Signatory has won Olympic medal	OLYMPMED	0.0581	0.4957		0.0637	0.4764		0.0953	0.3895	
<b>Characteristics related to birth-year/whether alive</b>										
Signatory's year of birth	BYEAR	1.0084	0.0015 ***		1.0479	0.0020 ***		1.4098	0.0030 ***	
Signatory is male	MALE	4.8205	0.0006 ***		4.9780	0.0008 ***		6.0210	0.0024 ***	
Area of Business of Signatory:										
Sport										
Films only	FILMONLY	3.4220	0.0003 ***		3.6850	0.0003 ***		5.4789	0.0010 ***	
TV only	TVONLY	-0.9634	0.2198		-1.0244	0.2139		-1.0715	0.2860	
Films + TV	TVFILM2	0.1669	0.9260		4.1720	0.0795 *		6.0078	0.0519 *	
Signatory is alive	ALIVE	5.5233	0.0002 ***		5.7629	0.0003 ***		7.3734	0.0009 ***	
<b>Interactive terms</b>										
ALIVE *										
MALE	ALMALE	-4.9869	0.0006 ***		-5.1490	0.0009 ***		-6.3175	0.0022 ***	
SPORT	ALSPORT	1.8486	0.1580		1.9595	0.1550		2.5720	0.1437	
FILMONLY	ALFILMO	-5.0661	0.0000 ***		-5.4058	0.0000 ***		-7.4578	0.0003 ***	
TVONLY	-									
TVFILM2	ALT VFLM	-2.0696	0.2614		-6.1773	0.0156 **		-8.2414	0.0141 **	
BYEAR	BYALIVE	-1.3775	0.0002 ***		-1.4369	0.0003 ***		-1.8473	0.0008 ***	
BYEAR *										
MALE	BYMALE	-1.1901	0.0005 ***		-1.2277	0.0008 ***		-1.4890	0.0023 ***	
SPORT	BYSPORT	0.4859	0.0461 **		0.5105	0.0476 **		0.5729	0.0817 *	
FILMONLY	BYFILMO	-0.8484	0.0002 ***		-0.9137	0.0003 ***		-1.3545	0.0010 ***	
TVONLY	BYTVO	0.1877	0.2696		0.1996	0.2632		0.2045	0.3464	
TVFILM2	BYTVFILM	-0.0580	0.8916		-1.0238	0.0718 *		-1.4744	0.0466 **	
BYEAR * ALIVMALE										
SPORT	BYALMALE	1.2251	0.0005 ***		1.2637	0.0008 ***		1.5525	0.0021 ***	
FILMONLY	BYALSPT	-0.4170	0.1624		-0.4414	0.1599		-0.5734	0.1529	
TVONLY	BYALFLMO	1.2022	0.0000 ***		1.2838	0.0000 ***		1.7796	0.0003 ***	
TVFILM2	BYALTVF2	0.4634	0.2869		1.4507	0.0166 **		1.9487	0.0145 **	
Constant										
Lambda		-1.2505	0.2898		-1.3468	0.2847		-2.4957	0.1513	
Sigma-sq		-0.2853	0.0000 ***		-0.2749	0.0000 ***		-0.2292	0.0000 ***	
Adj R-sq (OLS on transformed model)		0.0147	0.0045		0.0161	0.0062		0.0238	0.0167	
		0.5385			0.5239			0.4683		
<b>Normality tests on residuals (transformed model)</b>										
	Anderson-Darling		0.0000 ***			0.0000 ***			0.0002 ***	
	Shapiro-Francia		0.0000 ***			0.0000 ***			0.0001 ***	
	Shapiro-Wilk		0.0000 ***			0.0000 ***			0.0001 ***	

† NUMUKALB+1 was variable used

Table 2. Box-Cox Nonlinear Regression Model. Autographs with photos.  
(b) Effect of eliminating very low priced autographs

Sample criteria:		Price >=30, <1500			Price >=40, <1500			Price >=50, <1500		
Sample size:		634			624			617		
Variable		Coefficient	P-Value	Sig.	Coefficient	P-Value	Sig.	Coefficient	P-Value	Sig.
<b>Characteristics of artefact</b>										
Autograph is framed	FRAMED	0.1040	0.0152 **		0.0576	0.0221 **		0.0386	0.0285 **	
Autograph is separate from photo	SEPPHOTO	0.0208	0.4488		0.0100	0.5264		0.0052	0.6319	
<b>Characteristics of signatory</b>										
Signatory born outside US/UK	NONUSUK	0.0334	0.0361 **		0.0167	0.0668 *		0.0119	0.0654 *	
No. of UK top 10 albums†	NUMUKALB	0.0054	0.0028 ***		0.0030	0.0051 ***		0.0021	0.0073 ***	
Signatory has won Olympic medal	OLYMPMED	0.0786	0.3850		0.0437	0.4008		0.0282	0.4335	
<b>Characteristics related to birth-year/whether alive</b>										
Signatory's year of birth	BYEAR	1.1451	0.0037 ***		0.5658	0.0120 **		0.3166	0.0342 **	
Signatory is male	MALE	4.8964	0.0030 ***		2.4435	0.0098 ***		1.3850	0.0276 **	
Area of Business of Signatory:										
Sport	SPORT	-1.9031	0.0917 *		-1.0164	0.1181		-0.6656	0.1394	
Films only	FILMONLY	4.4833	0.0013 ***		2.1526	0.0064 ***		1.1139	0.0290 **	
TV only	TVONLY	-1.4424	0.1014		-0.8840	0.0882 *		-0.7292	0.0540 *	
Films + TV	TVFILM2	4.8585	0.0558 **		2.8290	0.0584 *		2.0371	0.0548 *	
Signatory is alive	ALIVE	5.9817	0.0012 ***		3.0024	0.0047 ***		1.7961	0.0119 **	
<b>Interactive terms</b>										
ALIVE *										
MALE	ALMALE	-5.3076	0.0023 ***		-2.5606	0.0092 ***		-1.4819	0.0242 **	
SPORT	ALSPORT	2.1992	0.1292		1.1420	0.1697		0.7643	0.1855	
FILMONLY	ALFILMO	-6.0318	0.0004 ***		-2.9786	0.0022 ***		-1.6837	0.0081 ***	
TVONLY	-	-	-		-	-		-	-	
TVFILM2	ALTVFLM	-6.6323	0.0165 **		-3.7978	0.0209 **		-2.7336	0.0205 **	
BYEAR	BYALIVE	-1.4986	0.0011 ***		-0.7554	0.0041 ***		-0.4521	0.0106 **	
BYEAR *										
MALE	BYMALE	-1.2111	0.0028 ***		-0.6035	0.0093 ***		-0.3410	0.0269 **	
SPORT	BYSPORT	0.4549	0.0912 *		0.2428	0.1178		0.1589	0.1393	
FILMONLY	BYFILMO	-1.1083	0.0012 ***		-0.5313	0.0061 ***		-0.2741	0.0285 **	
TVONLY	BYTVO	0.2914	0.1255		0.1811	0.1054		0.1512	0.0638 *	
TVFILM2	BYTVFILM	-1.1925	0.0503 *		-0.6939	0.0532 *		-0.4991	0.0502 *	
BYEAR * ALIVE *										
MALE	BYALMALE	1.3013	0.0022 ***		0.6303	0.0087 ***		0.3632	0.0235 **	
SPORT	BYALSPT	-0.4897	0.1383		-0.2525	0.1824		-0.1678	0.2013	
FILMONLY	BYALFLMO	1.4394	0.0004 ***		0.7080	0.0023 ***		0.3965	0.0090 ***	
TVONLY	-	-	-		-	-		-	-	
TVFILM2	BYALTVF2	1.5677	0.0171 **		0.8993	0.0213 **		0.6467	0.0210 **	
Constant		-1.6882	0.2358		0.0885	0.9096		0.8134	0.1090	
Lambda		-0.2675	0.0000 ***		-0.3705	0.0000 ***		-0.4379	0.0000 ***	
Sigma-sq		0.0158	0.0224		0.0052	0.0415		0.0025	0.0561	
Adj R-sq (OLS on transformed model)		0.4650			0.4602			0.4654		
<b>Normality tests on residuals (transformed model)</b>										
	Anderson-Darling		0.0003 ***			0.0048 ***			0.0427 **	
	Shapiro-Francia		0.0002 ***			0.0016 ***			0.0289 **	
	Shapiro-Wilk		0.0002 ***			0.0020 ***			0.0491 **	

† NUMUKALB+1 was variable used



Table 3. Regression Models. Autographs without photos.

Estimation Method		Box-Cox			OLS with Log(Price) as dependent variable#		
Sample criteria:		Price < 5000			Price < 5000		
Sample size:		163			163		
	Variable	Coefficient	P-Value	Sig.	Coefficient	P-Value	Sig.
<b>Characteristics of artefact</b>							
Autograph is framed	FRAMED	1.0761	0.0252 **		0.9859	0.0000 ***	
Autograph is in a book	BOOK	0.0488	0.8714		0.0488	0.8184	
<b>Characteristics of signatory</b>							
Signatory born outside US/UK	NONUSUK	0.2246	0.2508		0.2057	0.2034	
No. of UK top 10 albums†	NUMUKALB	0.0370	0.0588 *		0.0340	0.0248 **	
<b>Characteristics related to birth-year/whether alive</b>							
Signatory's year of birth	BYEAR	-0.0049	0.9789		-0.0039	0.9802	
Signatory is male	MALE	0.2307	0.3741		0.2116	0.3411	
Area of Business of Signatory:							
	Sport	SPORT	-0.2560	0.5122	-0.2305	0.3322	
	Films only	FILMONLY	0.0207	0.9322	0.0187	0.9342	
	TV only	TVONLY	-0.6127	0.1143	-0.5712	0.0880 *	
Signatory is alive	ALIVE	ALIVE	-0.7908	0.0963 *	-0.7341	0.0324 **	
<b>Interactive terms</b>							
ALIVE *	MALE	ALMALE	-0.1139	0.7832	-0.1020	0.7948	
	SPORT	ALSPORT	1.2238	0.0907 *	1.1266	0.0135 **	
	FILMONLY	ALFILMO	-0.2877	0.4784	-0.2674	0.4926	
	Constant		6.2080	0.0000 ***	5.9533	0.0000 ***	
	Lambda		0.0136	0.8139			
	Sigma-sq		0.9083				
	Adj R-sq (OLS on transformed model)		xxx		0.2811		
<b>Normality tests on residuals (transformed model)</b>		Anderson-Darling		0.3269		0.4105	
		Shapiro-Francia		0.4817		0.5781	
		Shapiro-Wilk		0.3809		0.4708	

† NUMUKALB+1 was variable used

# Standard errors used include Whites adjustment for heteroskedasticity