



Analysing the Impact of BREXIT on Artists Careers within the United Kingdom by Examining the Market for 'Fine Art'

Prof PW Baur
School of Economics
University of Johannesburg
PO Box 524, Auckland Park 2006
South Africa
E-mail: Peterb@uj.ac.za

Abstract

The rapid increase in art sales over the last 30 years has highlighted the importance of the art market as both a generator of wealth for investors as well as a generator of income for artists. However, post the announcement of Brexit in 2016, there is growing concern by both institutions and artists that the trade in art will be affected by the events surrounding Brexit. This has been iterated by the Arts Council of England, which mentions that there is a negative market influence generated through the 'Brexit' event being transferred into the art markets. The art market itself has two distinct sectors, namely the primary and the secondary art markets, which have particular behavioural patterns unique to each sector. This paper makes use of the 'Brexit' to estimate the political economic effect on both the primary and the secondary art markets within the United Kingdom. This should be of interest to artists, art dealers and art investors alike, with particular consideration for the role of artists and their careers within the changing global political and economic environments as we have seen before in countries such as Germany during the 40's, USSR during the 50's, Cuba during the 60's, and so on. The growth of technology on an international level has impacted upon the role of the distribution of information which has impacted the art market in different ways. Two sets of models are constructed in this paper to examine the impact of Brexit on the primary and secondary art markets within the United Kingdom. The findings suggest that the 'Brexit' event has had a distinctly negative impact on the primary art market and a distinctly positive impact on the secondary art market.

Keywords: Brexit, art market, art tourism, artists, United Kingdom.

Introduction

The Global trade and investment in art is growing in importance amongst dealers and investors alike. The rapid increase in art sales over the past 30 years has highlighted the importance of the art market as both a generator of wealth as well as a generator of income. There is growing concern by artists and institutions that the trade in art will be affected by the events surrounding Brexit and much of the trade in art in Britain is directly related to the flow of international tourism into and out of the United Kingdom. These concerns seem quite legitimate when comparing the impact of the Global Art Price Index to other market indices such as the NIKKI, FTSE, DAX and Dow Jones. For some time now, the art market indicators appear to have outperformed many primary financial market indicators, especially between 2002 and 2012. It was during this period that many investors sought alternative market environments from which to mitigate portfolio risk.

The art market could be perceived as an alternative form of investment market (Baur, 2014), especially for those investors trying to diversify their portfolios. Despite some peculiar features inherent within art as an investment option or art as a market, such as the extremely heterogeneity and illiquidity nature of art and artworks are considered to be both consumable goods with aesthetic properties or as financial instruments with return prospects (Aye, et al., 2018).



Art Price indicators, such as Artprice.com, appear to indicate a high level of sensitivity to market changes that are happening within the global economy. Much of this behavioural response is induced through the broadening and deepening of information which is becoming available to society via the technology sector. The growth in technology is apparent via the increasing global access to Internet, and the social media, for example, Google, Facebook, Twitter, and other popular sites.

This growth in technology and the role of the distribution of information will impact the art market in different ways. The art market itself has two distinct sectors which have particular behavioural patterns unique to each sector. The primary art market includes art market activity traded through auction houses and leading art galleries and other art institutions. Then there is the secondary art market which involves the trade of art between the artist, art dealers and the public. While there is a distinct transmission mechanism which exists between the primary and the secondary sectors (Baur, 2014), both the sectors are influenced differently, specific to the particular nature and characteristics of the respective sectors.

Over the past two decades, the United Kingdom has experienced several international financial and political shocks, and according to Shiv Chowla, Lucia Quaglietti, Łukasz Rachel (2014) world shocks are likely to have been around two-thirds responsible for the lower levels of output (11% lower than a simple counterfactual of a continuation of the pre-crisis trend) since before 2008. These shocks have been specifically noticeable through the trade linkages which are an important channel for the transmission of world shocks to the United Kingdom. The financial linkages and spill-overs created through uncertainty are likely to account for the majority of the impact of the lower output experienced (Chowla, et al., 2014) within the United Kingdom.

This lower output can be attributed to a decrease in demand for United Kingdom exports while simultaneously the United Kingdom's import prices increased due to the weakening real effective exchange rate. In addition, the increased speculation due to the political impression of Brexit led to a tighter supply of credit and more volatile asset prices, especially with the rising levels of uncertainty which played a role in the transmission of world shocks into the economy of the United Kingdom (Chowla, et al., 2014).

According to the Arts Council of England (2018), there is a negative perception of the influence of Brexit on the art markets. This paper makes use of Brexit to estimate the effect of this political economic 'event' on both the primary and the secondary art markets within the United Kingdom. This should be of interest to artists, art dealers and art investors alike, especially considering the role of artists and their careers within changing political economic environments as we have seen before in countries such as Germany during the 40's, USSR during the 50's, Cuba during the 60's, and so on.

This paper will examine the impact of Brexit on the primary and secondary art market by referring to the Artprice index and the number of people working in the Art markets, respectively, within the United Kingdom.

Brexit and the Art Market

The news of Brexit came with many mixed emotions as states, governments, politicians and investors jostled for security in, what now appears to be, a particularly volatile period for both the business sector and the financial markets within the United Kingdom and the European Union overall. The advent of the Brexit decision (or referendum as is popularly referred to) culminated on the 23 June 2016, with 51.9% of the voters voting that the United Kingdom should leave the European Union. While the vote for Britain to Exit the European Union was cast in 2016, there were several delays in the finalisation of this decision (BBC News, 2019),



mainly due to conflicts in interest between the members of the British Government and the terms of Exit as proposed by the European Union.

While Brexit may have a determined financial impact of the international markets, Brexit is not similar to that of the financial crisis of 2008, both in construct and in nature. While a financial crisis has a strong asset base component, usually in the forms of substantial changes in credit volume and asset prices, severe disruptions in financial intermediation, are multidimensional and are usually difficult to characterize using single indicators (Claessens & Kose, 2013). They may have either endogenous and exogenous origins, arising from either of the private or public sectors. Financial crisis is evolutionary in nature evolving with far reaching implications locally and internationally. On the other hand, Brexit has a social base with a political agenda, and is localised within the European region, directly affecting the economies of England, Scotland, Wales and Ireland while indirectly impacting on most of Europe, the US and other countries whom are connected to the region through trade or political relations. According to Kippin, Knight and Bergen (2018), Brexit is fuelled by “discontinuity, disconnection, and the progression of a society and economy in which feeling ‘left behind’ has become an endemic, complex and structural problem” (Kippin, et al., 2018, p. 5).

Both the financial and the social contagion effect brought on by the news of Brexit spread rapidly across the markets. According to Anneken Tappe (2019), the FTSE100 and the strength of the British pound was rather negatively affected, while political tensions rose across the European Union as politicians and social organisations scrambled for maneuverability within the quagmire of socioeconomic opinion. The main reasons for the reaction to Brexit, included the increased uncertainty around the impact of Brexit on trade through tariff restructuring and an overall weakening of the British economy through the impact it would have on the British banking sector (Tappe, 2019), political uncertainty across the United Kingdom and tensions between member states such as North and South Ireland. Given the caution of investors still reeling from the real impact of the 2008 financial crisis, market speculation soared as investors began to seek financial havens in other economies.

Europe alone saw a shift of approximately 800 billion Euros (\$912 billion) of assets transferred from London to Frankfurt, with share prices of financial institutions based within the United Kingdom, (such as like Lloyds Banking Group, HSBC and the Royal Bank of Scotland) having dropped between 20% and 30% due to the overall market speculation and the negative sentiments of multinational business corporations. The adverse effects of Brexit also impact on export based companies within the United States which have been influenced by the relative strengthening of the US dollar to the British Pound (Reeves, 2019).

Reeves (2019) suggested that the impact of Brexit on portfolios led towards more defensive equity bundling and portfolio restructuring, as investors began to shy away from the perceived risky investment environments by realigning their portfolios with short-term bonds and further leaned towards an alternative hedge against currency and market risk, as can be seen in commodity prices and growing demand for bullion.

This also led investors to consider the benefits of investing in alternative markets, where market speculation is more contained, and assets act both as a store of value and a return to investment. Mitigating the risk component of portfolios, alternative markets have been known to offer additional forms of financial shelter, and according to a study by Baur (2017), investment portfolios began to adjust in the light of the ‘new’ market risks associated with the changing political environment as seen in Brexit. This ‘adjustment’ in portfolios allowed for diversify into ‘Art’ and ‘Cultural Artefacts’.

‘Cultural Artefacts’ or, simply put, ‘Art’, adds robustness to portfolios, by increasing the demand for works of art and contributes towards the growth in the trade of ‘Fine Art’ within the primary art market (Baur, 2017). This, in turn, would have an impact on the secondary art market, within the United Kingdom. In a study by McAndrew (2011), the share or distribution



of the trade of 'Fine Art' across borders, specifically between London and New York account for over 60% of the total trade flows of Art (McAndrew, 2011). The United States has maintained a leading position in the trade of art, and according to McAndrew (2018), the U.K. has maintained a dominant place in the 'art market' by accounting for over 60% of sales by value and also by being the primary centre for international art trade. The United States accounted for 42% of the total value of global sales of 'Fine Art' in 2017. Much of this is attributed to its relatively under regulated trade structure which supports a more open market approach.

However, the trade of Art in the secondary art market is greatly influenced by the number of tourists visiting the United Kingdom and the amount of capital tourists are willing to spend in the market for products of 'Art' and 'Cultural Artefacts'. Combined with the massive increase in the size of the art market over the last 25 years (McAndrew, 2011), the trade in art has been driven by the increasing levels of wealth, greater movements of people across borders in search of art, art goods, and cultural products, the availability of new and better information made available through technology and the internet.

Yet, the market for 'Fine Art' is not totally without an exogenous market influence. Governments act in such a way as to support the trade of art through the promotion of the supply of works of art through funding initiatives into various arts, and further encouraging additional interest in private sales and investment through various fiscal incentives. While the state is also considered to be the overarching governor of the market, it does so by regulating the trade of 'Fine Art' within and across borders. Globally, the market for 'Fine Art' is one of the most dynamic markets of the 21st century. Yet art is far from been in any way homogenous and the market is distantly asymmetrical, with information rigidities and an abundance of 'noise' (Baur, 2014).

The art market is made up of a combination of many distinct sectors, including art, ballet, theatre and music many of which are developing at their own independent rate, and their own levels of inherent risks (McAndrew, 2011). Growing access to technology, the boom of the internet and ever increase in the speed of data transfer has made access to information a lot faster and a lot easier (Baur, 2016). This access to technology and better access to information has led to reducing the asymmetric nature of the art markets, and further facilitating the trade of art on an international level.

Since 'Fine Art' is mobile, durable, and portable, investors and traders alike use 'works of art' as a regulatory arbitrage to access financial leverage within both the formal and the informal markets, making this specific type of asset vulnerable to felonious activity. Therefore, governments are continuously monitoring the market, providing structural support to ensure that the cultural heritage of a country is kept intact (Baur, 2018). Yet this type of monitoring policy can cut both ways. This can happen when the trade of works of art, and the movement of such trade is accompanied by structural or market rigidities imposed through governmental regulations, such as taxes and trade restrictions. These regulations may add additional costs to the traders of art (McAndrew, 2018) or even restrict the flow of art across boarders or between regions.

Alternatively, the trade of art, especially in the Primary Art Market, is greatly influenced by the growth of technology, better access to information and a wider coverage of media. Such advancements in technology and broader access to the internet, which is providing the market with more insight into the cultural activities taking pace within the United Kingdom. Figure 1 highlights the growth in the export of Art from the United Kingdom between 1998 and 2018.

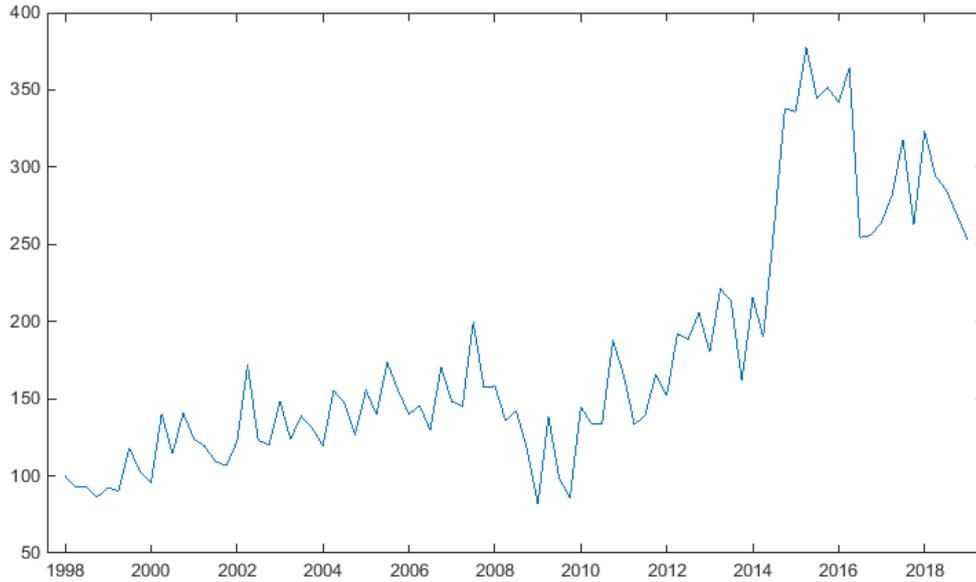


Figure 1: Growth in the Export of Art from the United Kingdom, (1998=100)
Source: (Office for National Statistics, UK, 2019)

The international trade in art by tourism contribute greatly to the trade in 'Fine Art', and are an important part in the overall growth in the market for 'Fine Art' and other products of cultural value. This does not imply that the 'Art Tourist' is the only form of tourism. Tourism contributes, overall, quite significantly to the trade of art in the Secondary Art Market. Figure 2 shows the change in exports of tourists into the United Kingdom since 1998. From 2016 onwards, there is a rapid decrease in the value if the exports made by tourists visiting the United Kingdom.

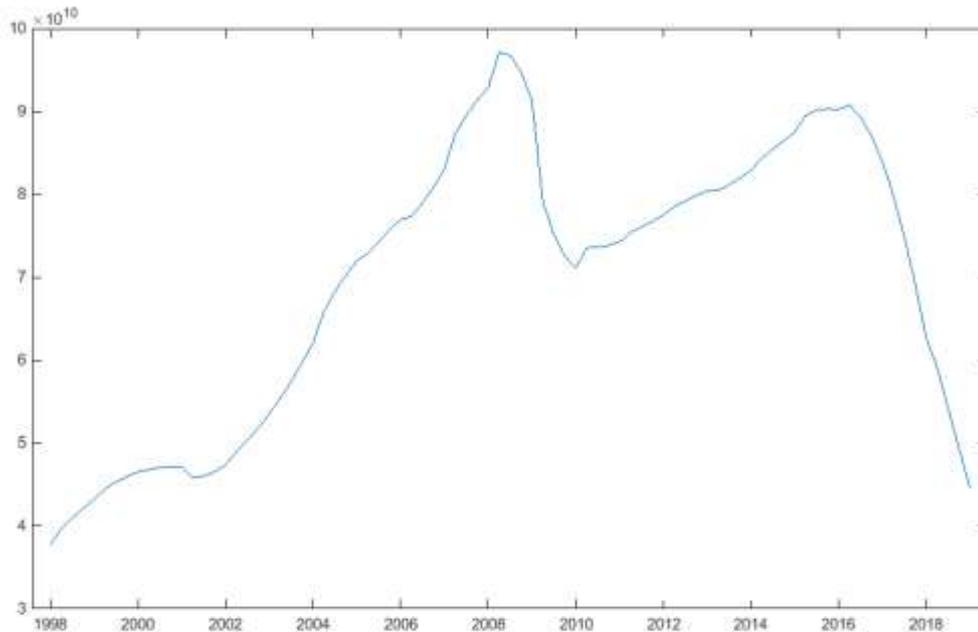


Figure 2: Growth in the Export by Tourists from the United Kingdom, (1998=100)
Source: (Office for National Statistics, UK, 2019)

The market for art is divided into two interrelated and sometimes independent markets, namely, the primary (which consists of major auction houses and large established art galleries), the secondary art market (which is made up of the trade between buyers and sellers in a less organised and formal nature). As these two distantly separate art markets exist, according to Baur (2017), the trade for 'Fine Art' on the secondary art market has an impact on the value of art been traded on the primary art market.

The primary art market is not disassociated from the secondary art market, due to the transmission mechanisms, and all decisions to invest in the primary art market would be based purely on the information available and the price that buyers of art are prepared to pay for such information. Yang, Ewald and Wang (2011) explain that price in the primary art sector depends on the extent and quality of the information available to the individual investors or dealers. The value of this information is estimated by considering the level of the optimal expected utility that the investors or dealers can acquire given the existing information and an increased in the level of information that they may acquire over time (Yang, et al., 2011). Because, most of the art is not traded in the primary, the secondary art market is also important for the creation of jobs within the market for art.

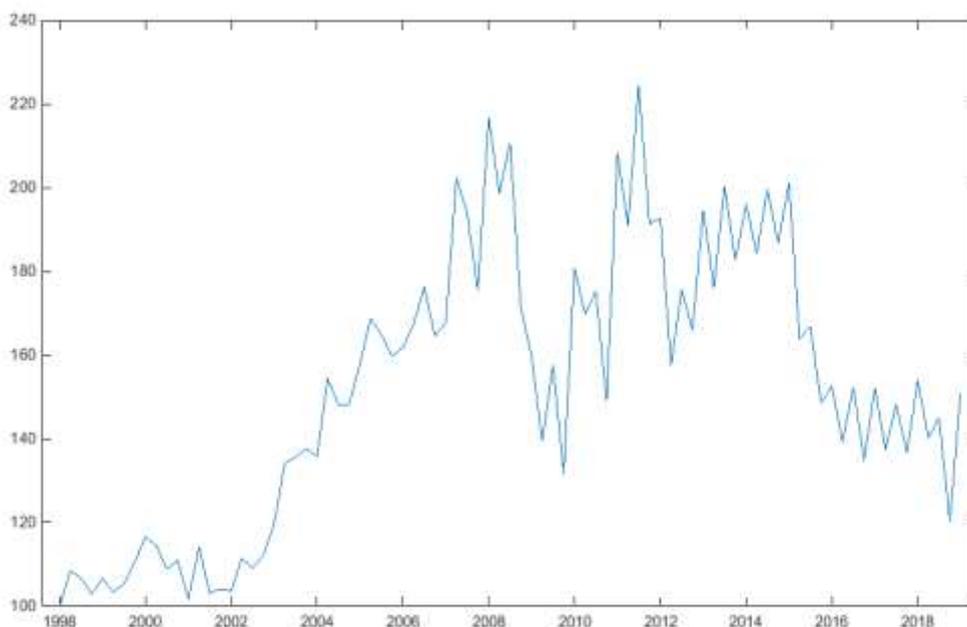


Figure 3: Art Price Index, 1998-2019, (1998=100)

Source: (Artprice.com, 2019)

The primary art market is usually measured using indicators, such as the Artprice index published by Artprice.com, as is shown in figure 3. Other indicators are available such as the Mei Moses Christies Art Price Index, which apparently dates back as far as the 1800's. While the Art price Indices are very useful in measuring the activity within the primary art market, there is still some caution which should be applied to the indices. Most noticeable is the subjective nature which must be applied to the weightings of the key variables within the index. Then there is the irregular movement of art through the different auctions, and the heterogeneous nature of the art been measured over a period of time.

The art price market indices produced by the respective art institutions often show slight differences in methodology applied when developing and constructing such indices. Yet different indices also show similarity in the dynamics to how they reflect the market dynamics

when compared to other market indices. This trend is perceived to be a measure of the aggregate (overall) prices for 'Art' which is characterized by the degree of substitutability within this market. The overall effect of the aesthetic returns derived from this depends predominantly on the specific identity of the respective artefacts been traded or auctioned. This, in itself represents a second order component in the estimation of the aggregate market price (Candela & Scorcu, 1997). These aggregated market prices have only a limited influence the dynamics within the market due to the asymmetric nature of the market, and the heterogeneous nature of the art been traded.

This being said, while the art price indices may behave in a similar way to the other market indicators, the very nature of an art price index captures more than pure market dynamics. The art price index has an inherent component which captures a number of international shocks or events, such as culture, values of society, social trends, political trends and economic trends as well. Figure 3 demonstrates the impact of both the 'Financial Crisis' (downturn between 2008 and 2010) and BREXIT (increasing market volatility from 2016). The Art Price Index also responded more subtly to other international events, such as political elections, trends and tastes in the public sector, opinions of experts and other financial and economic shocks. While the Artprice index captures the activity in the primary art market, the activity in the secondary art market is measured through the number of individuals working within the art market sector.

The number of people employed in the Art Market within the United Kingdom provided in the National Accounts and are shown in Figure 4. There has been a very progressive increase in the growth of the number of jobs since 1998. Here too, the data reveals that there is a distinct response to the 2008 financial crisis. Another factor which is evident, is the increase in the volatility of this sector post the 2016 Brexit referendum.

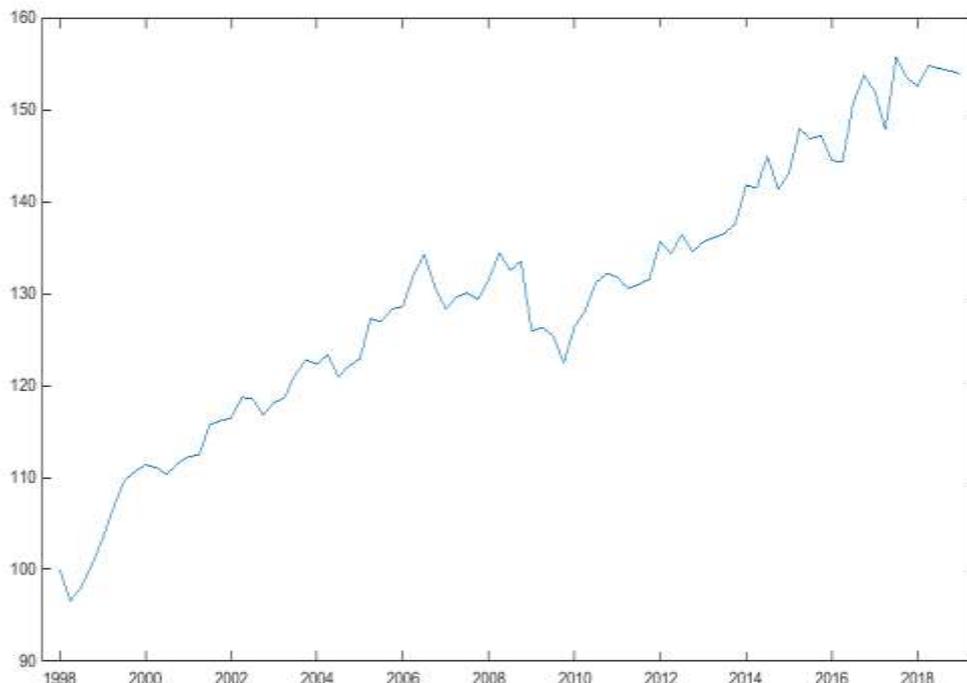


Figure 4: Employment in the Secondary Art Market, 1998-2019, (1998=100)

Source: (Office for National Statistics, UK, 2019)

From Figure 4, it can be shown that the growth rate of jobs in the art market between 1998 and 2019 increased by over 50%, with a mean growth year on year of approximately 0.5%



annually. The highest growth in the Secondary Art Market appears to be post the 2016 Brexit referendum, while the greatest loss of Jobs within the Secondary Art Market appears to have been during the 2008 financial crisis¹.

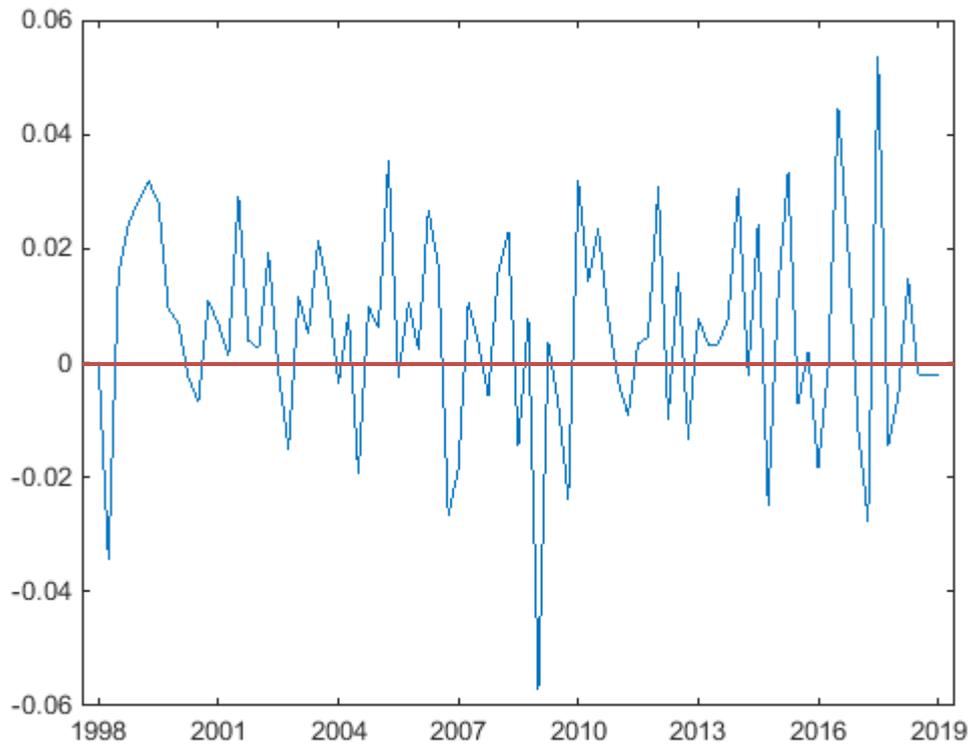


Figure 5: Growth of Jobs in the Secondary Art Market, 1998-2019.
Source: (Data derived from the Office for National Statistics, UK, 2019)

To remove any seasonal influence, a 4 period standard average smoothing process to the growth rates of employment in the Primary Art Market between 1998 and 2019, using quarterly data. This revealed that the greatest job losses were experienced within the United Kingdom during the 2008 financial crisis, while there was the greatest level of recovery just following the 2008 financial crisis, within this sector. Figure 5 shows the high volatility in the Secondary Art Market between 2016 and 2019 and this volatility in the Secondary Art Market becomes even more apparent when assessing the data using this 4 period smoothing process.

¹ The data was processed using MATLAB 2014b. The high volatility in the Secondary Art Market between 2016 and 2019 is even more apparent when assessing the data using a 4 period simple smoothing process to remove seasonality effects on the data.

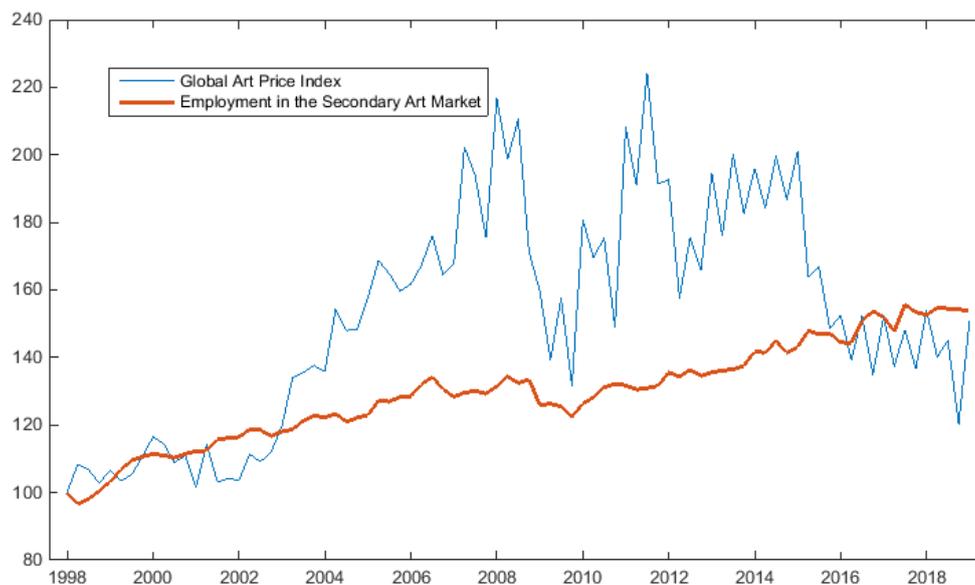


Figure 6: Comparing the Growth of Jobs in the Secondary Art Market, with the Art Price Index from 1998 to 2019, 1998=100.

Source: (Data derived from the Office for National Statistics, UK, 2019 and Artprice.com, 2019)

There is a positive correlation of only 61.2%² between the number of people employed in the Secondary Art Market and the Primary Art Market as is indicated by the Art Price Index. This shows that there is not a distinct direct relationship between the Primary Art Market and the Secondary Art Market. While the market for 'Fine Art' is often considered difficult to qualify, it is able to incorporate many additional non-price related values, such as, culture, subjective preference or social stigma, to determine not only a price, but also an investor return.

It must be reiterated that the Primary and the Secondary Art market's function as two independent yet interrelated entities. However, there is evidence that a transmission mechanism exists between the two art market sectors. In assuming a disassociated state, the decision to invest in the primary art market is often driven by investor sentiment and other specific fundamentals relating to the nature of the art being invested into. A feedback process generated from the returns derived in the primary art market may influences prices on the secondary art market. When a secondary transmission occurs which reflects back into the secondary market from the primary art market.

Methodology

For the purpose of this study, both the Primary Art Market and The Secondary Art Market were analysed separately. The data was analysed using the Ordinary Least Squared method. For each sector, a set of independent variables was selected, and these were analysed against each of the dependant variables, namely, the Art Price Index for the Primary Art Market and

² The 61.2% correlation is derived by using the log return of the Artprice index and the log return of the number of people employed within the mark. The low correlation between the two sectors implies that the analysis will need to assess the dependant variables representing the Primary Art Market and the Secondary Art Market as two different sectors with two distinct sets of independent variables respectively.



the number of employed within the Art Market in the United Kingdom as the dependant variable in the Secondary Art Market.

All data was analysed using a cross correlation within the model to estimate a positive or negative relationship. The impact of Brexit was analysed on each of these two sectors using a 'Dummy' variable, and all relevance using the specified hypothesis testing, probability values and students t-statistics.

Additional analysis was done on the models, estimating for the impact of 'white noise' in the market, and a Monte Carlo Simulation was undertaken when comparing the models and developing a forecast scenario.

The Primary Art Market

The Primary Art Market is that portion of the art market within the formal economy which incorporates the investment houses and primary art dealerships. This sector and is dominated by monetary institutions (Baur & Els, 2015) and the movement of art between the layers of this sector are highly regulated. The regulation of the market breeds its own inefficiency. The Primary Art Market is considered the smaller of the two sectors (Arts Council England, 2018), when compared to the Secondary Art Market which is made up of private sales and informal markets through which art is traded, or where Art is purchased directly from the artist.

The dependant variable used in this study to address the Primary Art Market is the Artprice index. This index has been released by Artprice.com, an art institution which has developed a Global Artprice index, providing quarterly data from the first quarter of 1998. This index is divided into several sub-indices to incorporate inherent differences within the different art markets. These sub-indices include Paintings, Prints, Sculpture, Photography and Drawings. Furthermore, they include in the sub-indices, additional divisions such as the old-masters, 19th Century Art, Modern Art and Contemporary Art (Artprice.com, 2019).

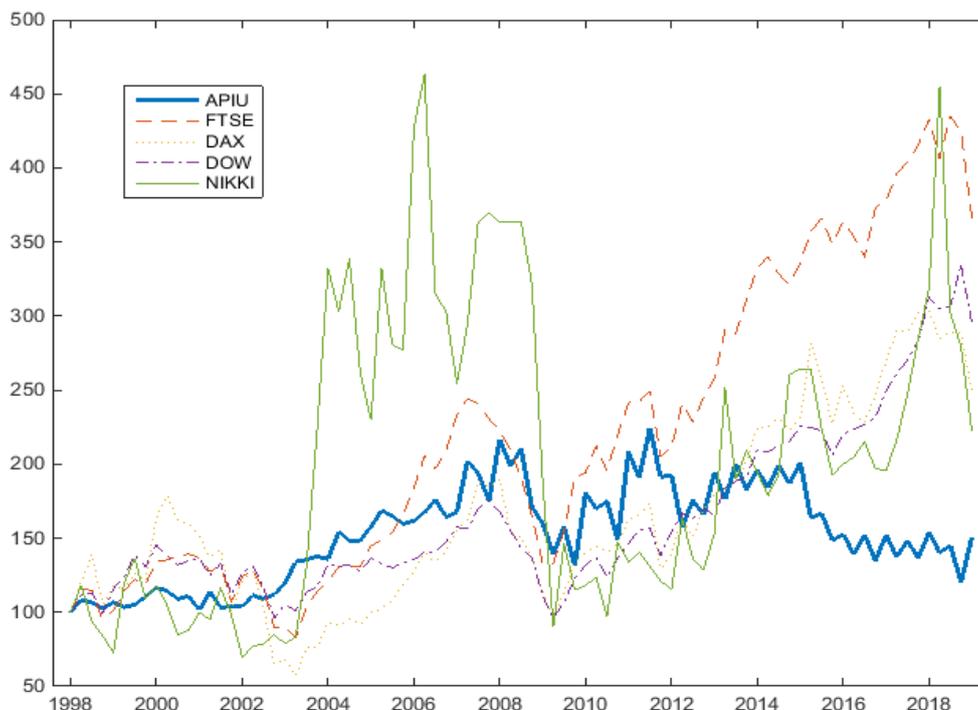


Figure 7: Comparing the Global Art Price Index with the FTSE25, Dow Jones,

DAX30 and NIKKI, from 1998 to 2019, 1998=100.

Source: (Data derived Reuters, 2019 and Artprice.com, 2019)

From Figure 7, the problem of volatility experienced in the art market becomes quite apparent post 2008 and then again post 2016. The downturn induced by the 2008 financial crisis has had noticeable impacts on the financial markets³. Between 2002 and 2013, the Artprice index appeared to outperform the other main financial markets with the exception of the NIKKI and the FTSE, which appeared to outperform most of the financial sectors across the board. From 2014 onwards, the Art Price Index showed signs of slowing down and the remaining market indicators, including the FTSE, Dow Jones, DAX and NIKKI, begun to outperform the Art Price Index.

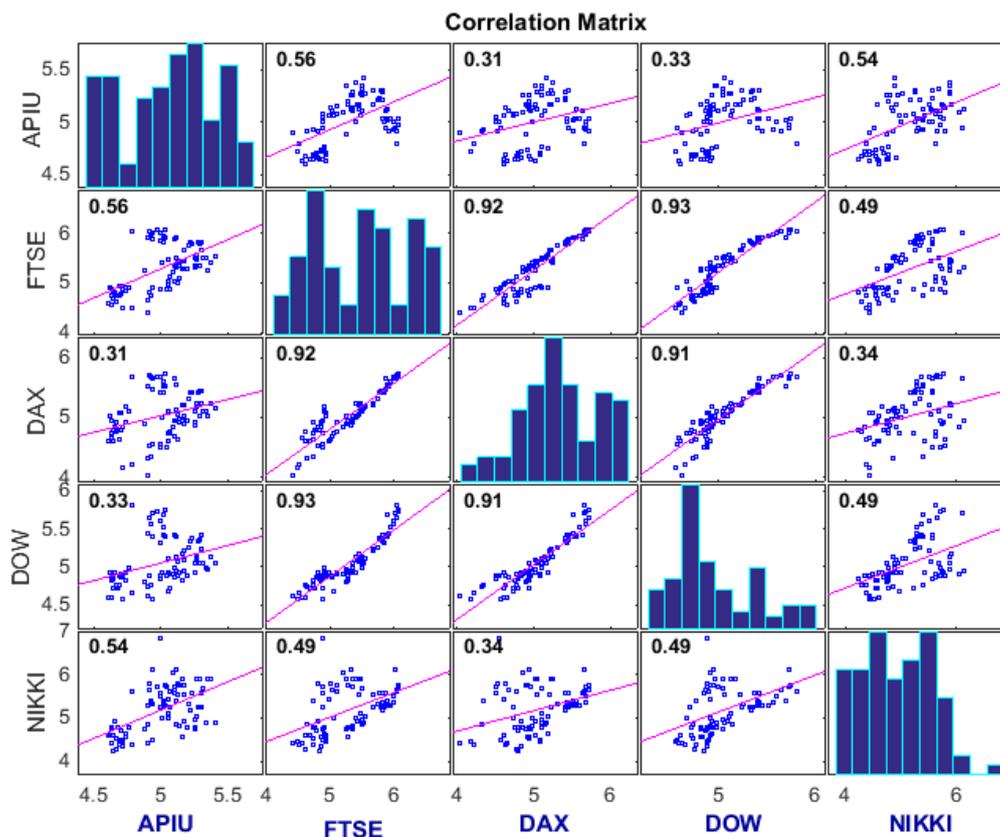


Figure 8: Correlation Matrix Comparing the Global Art Price Index with the FTSE25, Dow Jones, DAX30 and NIKKI, from 1998 to 2019, 1998=100.

Source: (Data derived Reuters, 2019 and Artprice.com, 2019)

The Correlation Matrix in Figure 8 highlights that there is a strong correlation between the Art Price Index and the FTSE of 56%. This is also true for the relationship between the Art Price Index and the NIKKI, with a correlation of 54%. The DAX and the DOW jones show much lower correlation coefficients of 31 and 33% respectively. Despite the high correlation between

³ The impact of the financial crisis of 2008 will be assimilated into the data and is treated in the analysis as a 'Dummy' variable to highlight the impact of the financial crisis pre and post 2008, and another 'Dummy' variable will be used to assimilate for the impact of Brexit on the dependant variables for each of the Primary Art Market and the Secondary Art Market.



the FTSE, DAX and DOW (92% and 93% respectively), there is a relatively low comparative correlation between the NIKKI and FTSE of 49%. This implies an independence between the impact of the Art Price Index on the FTSE and the NIKKI.

The Global Art Price Index and the Gold Price

Gold is usually considered a 'store of value' which would be deemed useful if an investor wishes to hold an asset with a high liquidity option while simultaneously diversifying portfolio risk. The gold price is an important market indicator of global market risk, in that it not only indicates the desire to hold stock as a 'store of value', but also gives a very good idea in terms of market and exchange rate uncertainty. For example, as the value of an exchange rate depreciates against other currencies, an investor may choose to buy gold, causing the price of gold to increase. When comparing the Real Effective Exchange Rate (British Pound) with the Gold Price in US\$, there is a strong negative correlation of 84.74%.

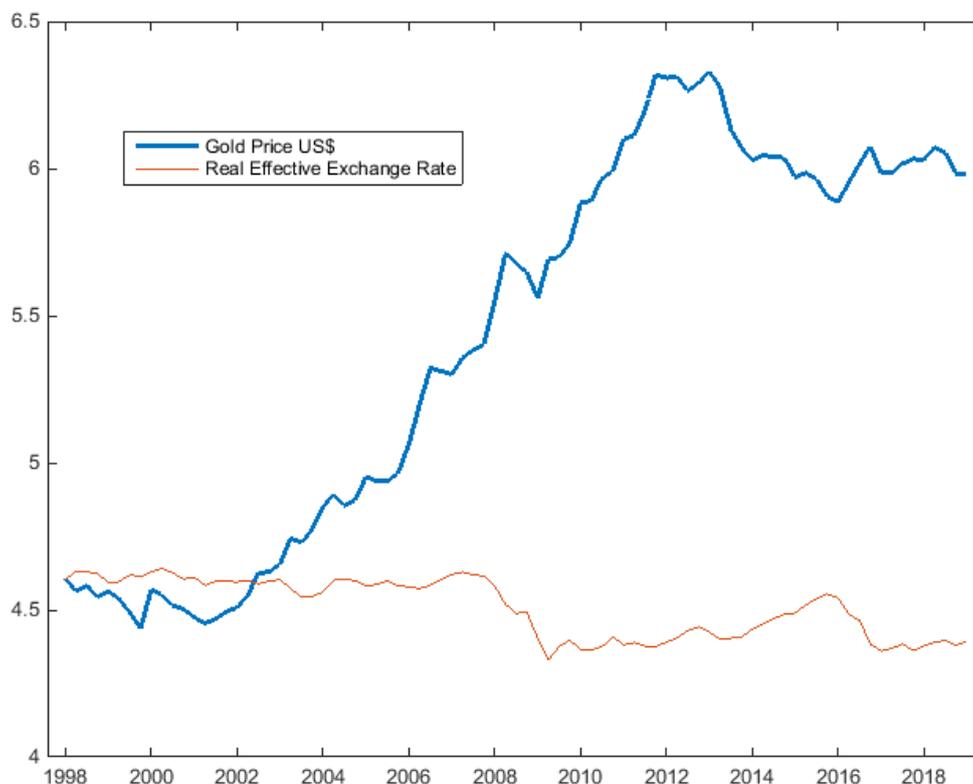


Figure 9: Comparing the log of the Real Effective Exchange Rate and the Log of the Gold Price US\$, from 1998 to 2019, 1998=100.

Source: (Quantec, 2019)

The British Pound has been comparatively stable to other currencies. As the Pound depreciated against other global currencies, the price of gold showed an increase. Gold holds a 'store of value', beyond sudden disruptive increases in supply which may temporarily



weaken the gold price. When examining the relationship that exists between the Art Price Index and gold price in US%, there is a positive correlation of 73.38%⁴.

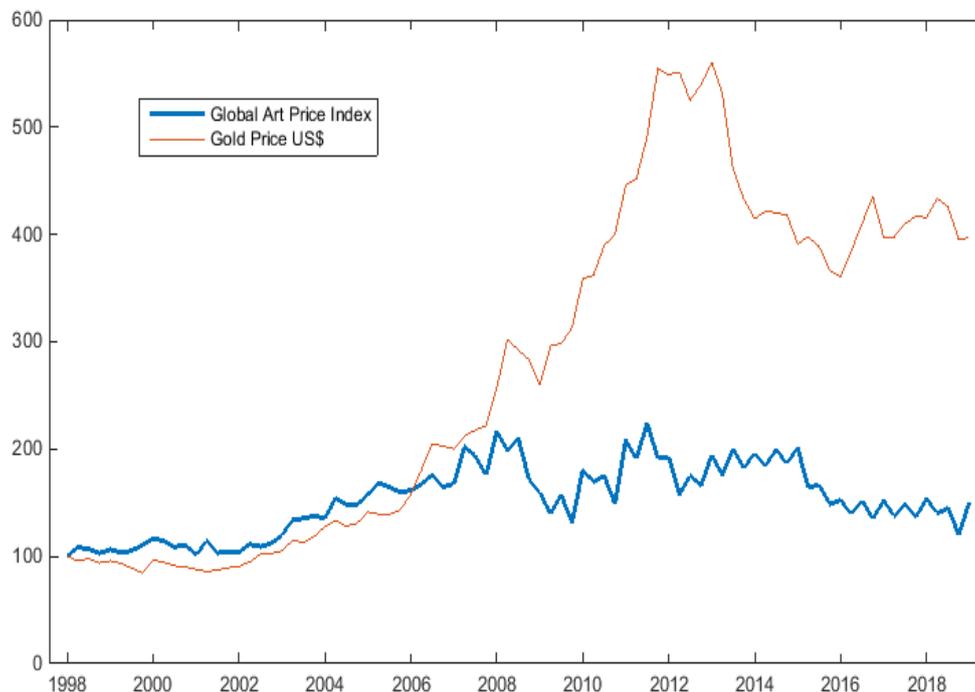


Figure 10: Comparing the Global Art Price Index and the Gold Price Index in US\$, from 1998 to 2019, 1998=100.

Source: (Data derived from Quantec, 2019 and Artprice.com, 2019)

Figure 10 highlights that the gold price index started to outperform the Artprice index only from 2006 onwards, preceding the impact of the 2008 financial crisis. This could imply that the global equity market may have anticipated a form of market shock. At this time, between 2006 and 2008 the Global Art Price Index started to climb. Similarly, from figure 10, the Gold Price in US\$ stated to climb again in 2016 while the Global Art Price Index showed signs of greater volatility.

⁴ The log of the Gold Price Index is compared to the log of the Global Art Price Index using US\$, quarterly data, first quarter 1998 as the base year. The log is applied to convert the exponential nature of the data to a straight line for the purpose of applying an Ordinary Least Squared Analysis. The correlation between Artprice Index and the Gold Price Index is measured using quarterly data from first quarter 1998 to first quarter 2019.

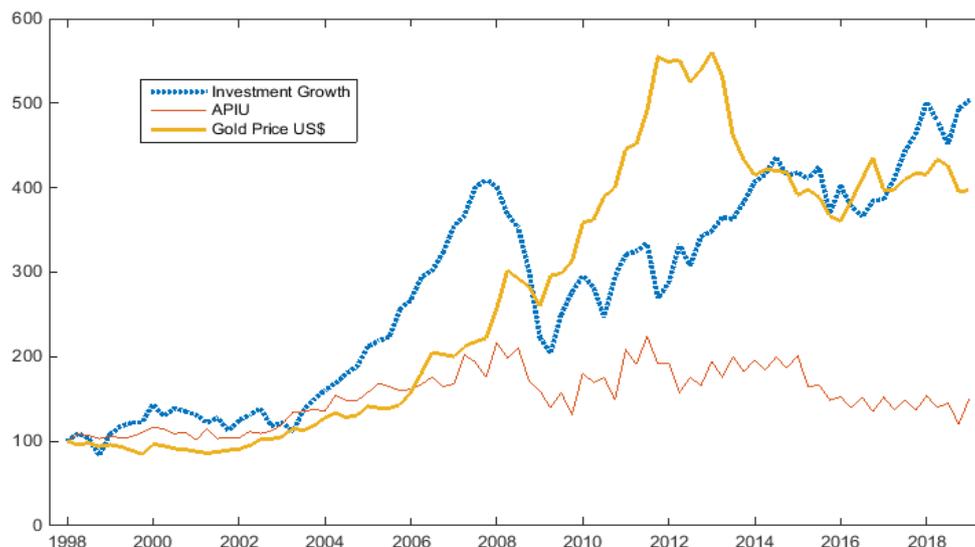


Figure 11: Comparing the Global Art Price Index, Gold Price Index in US\$ and Investment Growth in Equity and investment fund shares for the United Kingdom, from 1998 to 2019, 1998=100⁵.
 Source: (Data derived from Quantec, 2019 and Arprice.com, 2019)

Investment growth in equity and investment fund shares showed a remarkable change post 2016. This could emphasise that there was a degree of asset shuffling in portfolios which made a strong adjustment shift both in 2018 and again in 2016. The relationship between the log of the Gold Price in US\$ and the log of Investment growth is positive 88.64%. The relationship between the log of the Global Art Price Index and the log of Investment growth is positive 75.84%. Hedging of risk and portfolio reshuffling is particularly relevant during times of structural change.

Estimating the impact of Brexit on the Primary Art Market

The model used in this analysis will be constructed using a linear model, and all tests will be conducted using the Ordinary Least Square method (OLS). The model is based on a multiple linear regression equation, all non-linear data is converted to linear form. Therefore, the log of the dependant variable, namely the Global Art Price Index⁶ function was used to convert the Global Art Price Index (LAPIU) time series data to linear format. The model uses quarterly data from the 1998, until 2019. There are only 85 data observation points. The aim of this model is to serve as a descriptive model, analysing the impact of Brexit on the Primary Art Market. All data was indexed to 1998=100, and a log function was applied to the data to bring it in line with the straight line function used in this analysis.

Additional analysis will include testing the data for 'white noise' which could influence the distribution of the market within an asymmetrical and inefficient market (Aye, et al., 2018). The independent variables used in this model include: the Gold Price Index (LGPUS), in US\$, the growth in portfolio investment, equity and investment fund shares (LINV), for the United Kingdom, and the FTSE25 index (LFT25), specifically to assess the Financial markets within

⁵ United Kingdom, Quarterly Data, International Investment Positions, Assets, Portfolio investment, Equity and investment fund shares, US Dollars. 1998=100 Quantec EasyData (2019)

⁶ The Global Art Price Index was provided by Arprice.com. This was available online and is updated quarterly. The Arprice Index is made up of several sub-indices including Global index (USD), Modern art, Nineteenth century, Old Masters, Paintings, Photography, Post-war, Prints, Sculptures, UK and US.



the United Kingdom. A 'Dummy' variable (FINC) is used to mark the structural break induced through the impact of the 2008 financial crisis, and a second 'Dummy' variable will be used to estimate the impact of the structural break induced by the 2008 Brexit referendum (BREXIT)⁷.

Linear regression model will take the following format: $LAPIU \sim 1 + LGPUS + BREXIT + LINV + LFT25 + FINC$.

From this model, the following R-squared: 0.872, Adjusted R-Squared 0.864, F-statistic vs. constant model: 107, p-value = 9.11e-34.

	Estimate	SE	t-Statistic	p-Value
(Intercept)	2.6511	0.19359	13.695	1.4599e-22
LGPUS	0.30056	0.059872	5.0201	3.1239e-06
BREXIT	-0.19038	0.035529	-5.3586	8.0649e-07
LINV	0.43064	0.075852	5.6774	2.18e-07
LFT25	-0.28874	0.070671	-4.0856	0.00010472
FINC	-0.20591	0.054207	-3.7986	0.00028445

From this analysis, there is a positive relationship between the Art Price Index, the level of investment Growth and the Gold price Index and. This was highlighted in the work of Baur and Els (2015), showing that the Gold Price Index and the Art Price Index have very similar properties within the market. Due to investors hedging their risk, especially against currency risk (Baur & Els, 2015), where 'Fine Art' often plays an important role as an alternative investment. This was particularly evident with the negative relationship between the market for 'Fine Art' and the financial crisis of 2008.

The relationship between the FTSE and the Global Art Price Index is negative, indicating that the art market is considered as an alternative investment (Baur & Els, 2015) for many investors with diverse portfolio baskets. This negative relationship could highlight possible speculation trends within the British stock market.

Within this model, the impact of Brexit has a strong negative relationship on the Global Art Price Index. With an estimate value of negative 0.19, the highly elastic relationship between the Art Price Index and the Brexit event indicates that the relationship is very sensitive. With an adjusted R-Squared value of 0.864, this implies that only 86.4% of the variation is indicated in the model. This would indicate a reasonably good fit, but clearly there are elements in this analysis which are not explained by the model within the Primary Art Market.

The Durban Watson statistic of 0.1456 indicate that there is a positive autocorrelation that exists within the model. This could imply that there is a degree of momentum associated with Art Price. In other words, as the price of the stock of art increases over a historical period of time, then there is a likelihood that the upward trend in the historical price will cause the prices to increase in the future so not only to match those prices of the lagging time series, but also to motivate a future upward pricing trend.

A variation ratio test was applied to the model to test for any 'Random Walk' within the Art Price Index. This would help to decide if the variation in the movements in the Art Price Index are Random, or is there structure to the model. This model then assumes that if h=0 there is random walk at 5% level and (p<0.05) and if h=1 there is no random walk at 5% confidence level and (p<0.05). The Art Price Index is an h=1 model with the p value at 2.4011e⁻⁰⁶. In other

⁷ All data is analysed using MATLAB 2014b.

words, this model has sound structure underlying the decision making of the investor investing into 'Fine Art'.

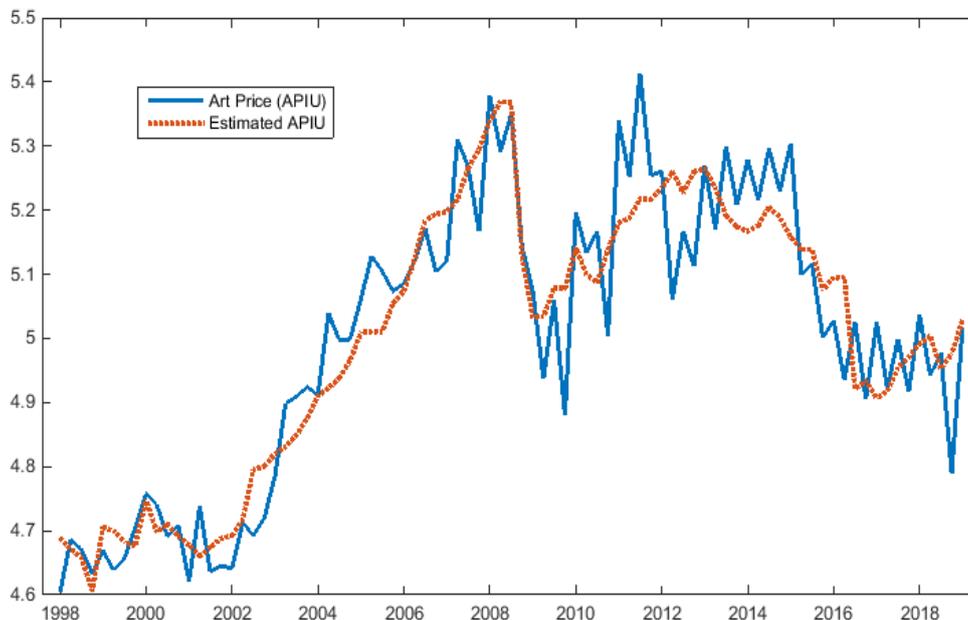


Figure 12: Comparing the Global Art Price Index and the Estimated Art Price Index, from 1998 to 2019, 1998=100.

Source: (Artprice.com (2019) and 'Estimate' derived from own data).

Another possible reason for the variance that exists between the estimated and the historical variables could be attributed to 'white noise'. 'White noise' is considered to be a random collection of uncorrelated variables or, in other words, an unsystematic error (Moffatt, 2018). The presence or absence of any given variable would have no causal relationship with any other variable or phenomenon. To estimate if the variance is created by 'white noise', the Ljung-Box Statistic: If there is not enough evidence to reject the null hypothesis, then there is evidence of white noise.

h_0 : Null Hypothesis (White noise) and h_1 : Alternative hypothesis (not white noise)

When applying the Ljung-Box Statistic, there is strong evidence against the null hypothesis. As a result, the investor would reject the null hypothesis and accept the alternative hypothesis. In other words, there is no evidence of white noise in the market. (p -value = $8.9595e^{-14}$).

From this model, there is clear evidence that Brexit has a negative effect on the Global Art Market as indicated in the Artprice.com index. A degree of variance still exists in the mode, which can neither be explained with 'white noise' or 'random walks'. Supposedly, neither the financial nor the economic indicators can fully explain this variance that exists between the Art Price Index and the estimated value. This therefore could indicate that human behaviour (psychic returns) is still an important component.

Most studies of art investment have been unable to quantify psychic returns associated with art in order to develop our understanding of the perceived returns generated from art as an investment. Furthermore, it is understood that the market for art is segmented, and this may also account for most behavioural anomalies within the art market and are often less understood (Worthington & Higgs, 2004). Often when researching the impact of financial indicators on the Art Price Index, there appeared to be weak correlations and insufficient theories to support the correlation that exists between art prices and international market

indicators. It is also possible that there are many cognitive or behavioural factors which need to be considered when developing such a model. It is true that when analysing 'Fine Art' as an alternative investment to be included within a portfolio bundle, the investor and the specific social and cultural characteristics of the investor which should be better analysed and understood (Baur & Els, 2015).

The Secondary Art Market

The Secondary Art Market is that portion of the art market within the formal and informal economy which incorporates the decision of individuals to purchase works of art. Prices in the secondary market are established using both basic market fundamentals of demand and supply as well as tastes, preferences and utility curves. The nature of the Secondary Art Market may differ from the Primary Art Market in that the expected returns within the Primary Art Market are likely to follow a different set of decision-making criteria from that of the Secondary Art Market. While the primary and the secondary market may function as two independent yet interrelated entities, there is evidence that a transmission mechanism may exist between the primary and the secondary art markets. Decision of investors to invest in the primary art market are more likely to be driven by investor sentiment and other specific fundamentals relating to the nature of the art being invested into, the Secondary Art Market often fulfils social and cultural appetites. It's important to highlight that there is a gap between the Primary Art Market and the Secondary Art Market, the Secondary Art Market reflects a feedback process which originates from the returns generated in the Primary Art Market and therefore has an influence on prices within the Secondary Art Market (Baur & Els, 2015). This feedback process will be indicated with the use of the Global Art Price Index (APIU) highlighted earlier in Figure 6. The dependant variable used in this study to address the Secondary Art Market is the number of people employed within the Art Market within the United Kingdom⁸. The Log of the data has been used to convert the data to a straight line trend.

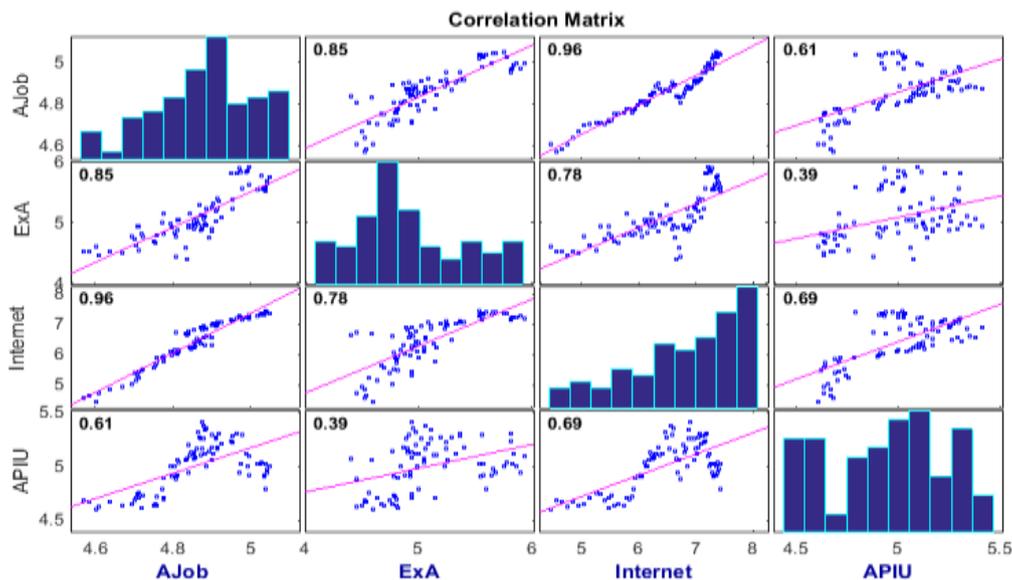


Figure 13: Correlation of Employment in the Art Market (Thousands), Export of Arts, Global Access to Internet, and the Global Art Price Index, from 1998 to 2019, 1998=100.

Source: (Derived from Office for National Statistics, UK, 2019)

⁸ Data used as a proxy for those employed within the British art market are referenced under the UK Workforce Jobs SA: R Arts, entertainment & recreation (thousands), JWT6, released on the 14/05/19. Quarterly data from first quarter 1998 to first quarter 2019, indexed to 1998 = 100.



Figure 13 indicates that there is a strong correlation between the employment within the Arts Sector of the United Kingdom (85% correlation), a very large correlation between employment in the arts sector and the global growth in Internet (96% correlation) and a relatively low correlation between the Global Art Price Index and the number of people employed in the United Kingdom arts sector (61% correlation). From this we can see the feedback mechanism from the primary sector has a positive impact. However, the mechanism underlying the workings of the Primary Art Market does not adequately describe the workings of the mechanism driving the Secondary Art Market.

Estimating the impact of Brexit on the Secondary Art Market

The model used for this part of the analysis will be constructed using a linear model, and all tests will be conducted using the Ordinary Least Square method (OLS). The model is based on a multiple linear regression equation; all non-linear data is converted to linear form. Therefore, the log of the dependent variable, namely the number of people employed within the United Kingdom Arts and Recreation Sector (AJob), was used to convert the non-linear time series data to a linear format (LAjob). This model uses quarterly data from the 1998, until 2019. There are 85 data observation points. The aim of this model is to serve as a descriptive model, analysing the impact of Brexit on the Secondary Art Market. All data is indexed to 1998=100, and a log function was applied to the data.

Additional analysis will include testing the data for 'white noise' which could influence the distribution of the market within an asymmetrical and inefficient market (Aye, et al., 2018). The independent variables used in this model include: The log of the Global Growth of 'Internet' (Lint), the log of the growth in the Export of Art from the United Kingdom (LExA). As per the analysis on the Primary Art Market, a 'Dummy' variable (FINC) is used to mark the structural break induced through the impact of the 2008 financial crisis, and a second 'Dummy' variable will be used to estimate the impact of the structural break induced by the 2016 Brexit referendum (BREXIT).

Linear regression model will take the following format: $LAjob \sim 1 + BREXIT + LExA + LInt + FINC + \epsilon$

From this model, the following R-squared: 0.976, Adjusted R-Squared 0.975, F-statistic vs. constant model: 828, p-value = 3.22e-64.

	Estimate	SE	t-Statistic	p-Value
(Intercept)	3.7639	0.033916	110.98	2.2032e ⁻⁸⁹
BREXIT	0.05161	0.0069263	7.4514	9.5175e ⁻¹¹
LExA	0.050028	0.0083632	5.9819	5.8967e ⁻⁰⁸
LInt	0.1323	0.0055546	23.818	4.5275e ⁻³⁸
FINC	-0.040799	0.0068652	-5.9428	6.9591e ⁻⁰⁸

From this analysis, there is a clear positive relationship between the dependent variable, Employment in United Kingdom Arts Sector, and the growth in both the exports of Art from the United Kingdom and the growth in the Global internet.

However, within this model, the impact of Brexit has a strong positive relationship on the employment within this art sector. With an estimate value of Positive 0.051, the highly elastic

relationship between the Brexit and employment in the United Kingdom art market sector indicates that this relationship is very sensitive to the political environment surrounding the art market, and even more sensitive than the relationship between Brexit and the Global Art Price Index.

With an adjusted R-Squared value of 0.975, this implies that 97.5% of the variation experienced in the market is explained in this model. This would indicate a good fit, but clearly there are always going to be additional factors which are not explained by the model within the Secondary Art Market.

The Durban Watson statistic of $1.6552e^{06}$ indicates that there is a high level of positive autocorrelation that exists within the model while according to the Augmented Dicky-Fuller test, the data proves to be stationary⁹.

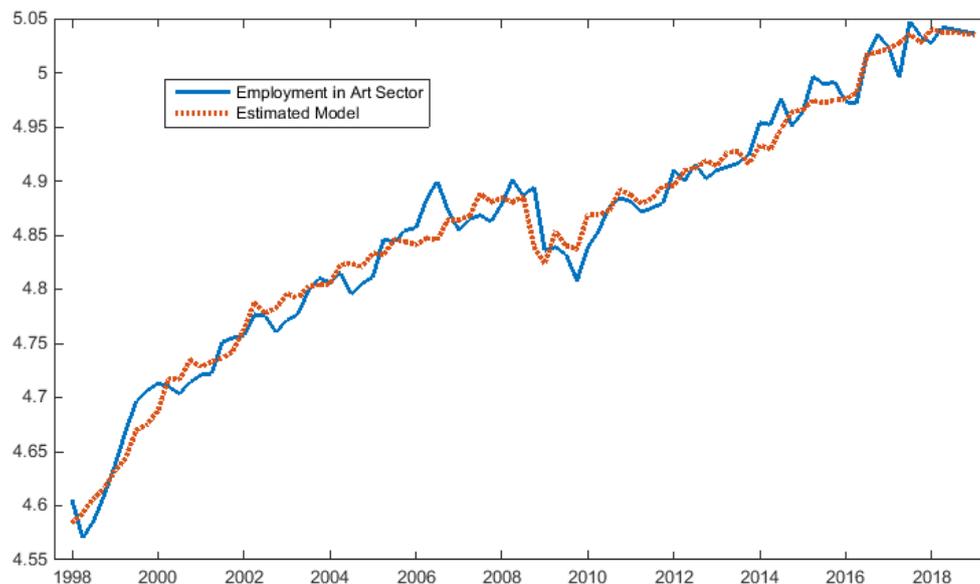


Figure 14: Comparing the Employment in the United Kingdom Arts and Recreation Sector Index and the Estimated Art Price Index, from 1998 to 2019, 1998=100.

Source: Artprice.com (2019) and 'Estimate' derived from own data.

From this model, there is clear evidence that Brexit has a strong effect on the employment opportunities within the United Kingdom.

⁹ The test for stationarity using the Augmented Dicky-Fuller (ADF) test: $h=0$ ($p>0.05$) is non-stationary and $h=1$ ($p<0.05$) is stationary: three lag choices as three separate tests are performed in this model. The values $h = 1$ $p>0.05$ indicate that the tests rejects the null hypothesis of a unit root against the trend-stationary alternative.

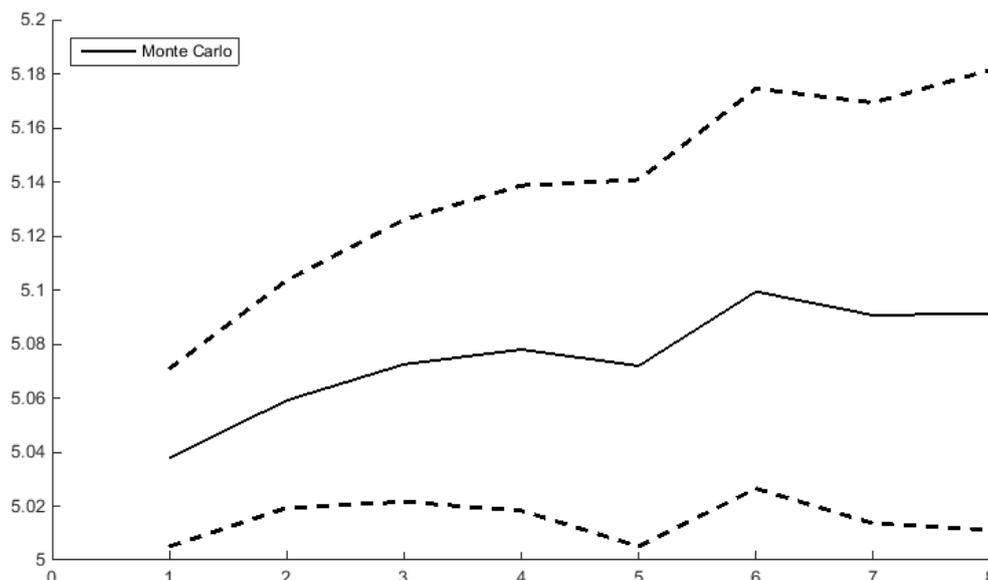


Figure 15: Using a Monte Carlo Simulation for 8 quarters (2 years)

Source of Data: Own Estimates

Figure 15 shows the possible direction of growth, given the political and social environment of Brexit. According to this model, there is a possible growth trend of job growth within arts and recreation within the United Kingdom for the next two years. This has a lot to do with the exports of art and access to technology which is broadening the potential markets for products of art within the United Kingdom. The relationship between the log of the job market and the log of exports of tourists has a 70% correlation. This implies that tourism still plays a large role in the art market, but the certainty of Brexit has an influence on the spending patterns of tourists. This in itself has a policy implication for both the British Politicians and the Global Art Institutions, alike.

By building tourism back into the model. The linear regression model will take the following format: $L_{\text{job}} \sim 1 + \text{BREXIT} + L_{\text{ExA}} + L_{\text{Int}} + L_{\text{UKTEXP}} + \epsilon$

From this model, the following R-squared: 0.971, Adjusted R-Squared 0.969, F-statistic vs. constant model: 659, p-value = $2.34e^{-60}$.

	Estimate	SE	t-Statistic	p-Value
(Intercept)	3.6759	0.062656	58.667	$1.6095e^{-67}$
BREXIT	0.068654	0.0095657	7.1771	$3.235e^{-10}$
LUKTEXP	0.057192	0.016294	3.5099	0.00073932
LExA	0.057959	0.0093216	6.2177	$2.1562e^{-08}$
LInt	0.090136	0.0071559	12.596	$1.1157e^{-20}$

From this analysis, there is a clear positive relationship between the dependent variable, Employment in United Kingdom Arts Sector, and the growth in Tourist Export Spending Exports of Art from the United Kingdom and the Growth in the Global internet.

Within this model, the impact of Brexit still has a strong positive relationship on the employment of artists within this sector. With an estimate value of Positive 0.06, the highly elastic relationship between the Brexit and employment within the United Kingdom art market



sector indicates that this relationship is very sensitive to the political environment surrounding the art market. With an adjusted R-Squared value of 0.969, this implies that 96.9% of the variation experienced in the market is explained in this model.

This would indicate a good fit, however, there are additional factors which are not fully explained by the model within the Secondary Art Market. By removing the impact of the Financial Crisis, the role of Tourism Exports becomes increasingly more important, implying that tourists responded differently to the Financial Crisis as they are responding to the ongoing Brexit event.

Conclusion

This paper examined the impact of Brexit on the Global primary art Market and on the secondary art market within the United Kingdom. This was done by using the Global Art Price index as the dependant variable in the primary art market, and job creation as the dependant variable in the secondary art market. The Primary and the Secondary art market respond very differently to the Brexit event, with a strong negative relationship between Brexit and the primary art market, and a positive relationship between Brexit and the secondary art market. Brexit is an event which has clearly taken the world by storm, and unlike a financial crisis or a market shock, the impact of Brexit, whether positive or negative, will have lasting implications for artists and art traders alike. There is concern that the secondary art market may be negatively influenced, especially if the flow of tourists entering into the United Kingdom may slow as a result of the changing terms of trade and international migration arrangements change across borders. Much of the trade of art in the secondary art market is through tourism, with works of art being sold to tourists and then taken home. If Brexit was to impact the flow of tourism, then there will be a slight negative effect. Yet, the politics surrounding Brexit is also creating such a stir within the media, that its currently having a positive impact.

In retrospect, within the global markets there is mounting uncertainty due to the Brexit event. This market uncertainty can be seen in the increasing price of Gold Bullion, which has recently reached record levels. The model was capable of capturing a large part of relationship between the primary art market and the Brexit event. The negative relationship highlights concern that the market sentiment is shifting away from the global art market, most likely as a result of the importance of London in the trade of art, and London also been one of a few very large primary art market centres. Additional analysis confirms that this model does not follow a random walk, and that the markets, both primary and secondary is less influenced by white noise than previously anticipated. Furthermore, this research agrees with previous research which has shown that the Global Art Price index and the Gold Price Index in US Dollars has a positive correlation, and given the Monte Carlo Simulation, there is a likelihood that the Global Art Price index will continue to recover, albeit at a very slow rate.

Brexit has posed a great number of challenges for policy makers and investors alike. The outcome of Brexit on the global art market may still appear uncertain, with the cloud of speculation surrounding the eventual outcome of Brexit on the primary art market, artists in the secondary art market should experience a growth of opportunities. These opportunities presented within this 'Bullish Art Market' should not be taken lightly, as in the words of Ernest Hemingway (1926), "Nobody ever lives their life all the way up, except bull-fighters".

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