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# Testing for bubbles in the art markets: An empirical investigation☆

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ABSTRACT

The market for artworks emerged about ten years ago and seems to have coincided with a rapid increase in the number of participants and record-breaking prices. This raises the question of whether this market is experiencing a rational bubble or not. In this paper, we apply a battery of tests to detect explosive behavior in the art markets from 1998 to 2015. According to the Markov Switching ADF test, two regimes exist for all the indices, but no bubble is found. However, applying the right- tailed ADF, we detect more than one bubble with most of the bubbles happening in the period 2002–2005. Then, accounting for the volatility shifts, we apply the bootstrap tests and find similar results. We argue that the market has been going through some adjustment after the 2008 financial crisis and becoming more sensitive to economic and geopolitical events, with the artworks demonstrating a level of maturity similar to other alternative investment classes. Our findings have important implications in recognizing the cause of bubbles and to take steps in reducing their impact on the economy.

## 1. Introduction

Despite the deterioration of the global economy, the global art market has posted a double-digit growth rate, and a growing attention has been directed by investors to alternative investments, such as the artworks. The development of the fine art funds confirms that investors view the artworks as just another asset class of investment. This growth was fuelled by an investment appetite, speculation, and a demand for the most well-known signatures. As a whole, the global art market has grown by 291% since 2000 according to the Artprice report[1] of 2016, but with a fall also in the number of exceptional masterpieces sent to auctions. This been driven by the market's globalization and economic fundamentals. Internationally, Chinese and emerging markets collectors are diversifying their acquisitions and investing in major signatures from all periods including Old Masters, Modern and Contemporary art.

This change has also been accompanied by access to new information, the dematerialization and financialization of the art products, the increase in the art-consuming investors, and the expansion of the market to emerging markets. Asian and Middle Eastern buyers are becoming better advised and continuing their museum expansion. The museum industry has become a reality with more museums opening between 2000 and 2014 than during the entire 19th and 20th centuries. Indeed, demand for museum quality artworks has become a key factor in the development of the global art market, with people from different generations and social classes eager to experience the characteristics afforded by the artworks in a world of increasing globalization.

This interest in the artworks is further matched by new strategies adopted by auction houses in using the Internet in promoting their market share. According to the Artprice report, 97% of auction houses are present on the Internet versus a 3% in 2005. The mobile Internet is helping auction houses in modifying their business models with the secondary market sales turnover posting an increase of more than 110%. Sales are taking place via Instagram and other social media sites, and that by itself is changing the way information is obtained and transmitted to the art markets.

All this was accompanied by a dramatic movement in art prices and volumes. The mega-million sales[2] that took place have prompted speculation that a bubble is brewing in the art market. These markets have seen such bubbles in the past—in late 1990, and just before the financial market crisis of 2008, when assets were traded at prices far above their fundamental values. That motivates the following questions: have the art markets been experiencing rational bubbles or not; will these bubbles continue to occur in the future; and what changes have been taking place in the art markets in recent years that will impact their prices and dynamics.

In this paper, we conduct a thorough analysis of bubbles in the arts

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[1] www.artprice.com/artprice-reports/the-art-market-in-2016.

[2] Examples include: the sale of the *Three Studies of Lucian Freud* for a price of $142,405,000; the sale of *Le Rêve* privately for $155 million; and the sale of *The Card Players* for a price of $250 million.

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markets using quarterly data constructed by the Artprice company. We apply the Markov Switching Augmented Dickey Fuller of Hall et. al (1999) and the right-tailed unit root tests of Phillips et al. (2015) and Phillips et al. (2011a, 2011b).[3] A similar study to ours is the recently conducted by Kraeussl el al. (2016) who analyze four different art market segments using annual data from 1970 to 2013. They analyze the Impressionist and Modern, Post-war and Contemporary, American, and Latin American segments and identify two historical speculative bubbles, with an explosive movement in the Post-war and Contemporary and American fine art segments. However, our contribution differs from that of Kraeussl el al. (2016) in the following aspects: first, we use a new data set constructed by the Artprice company and covers more market segments. Second our data set is at a quarterly frequency as opposed to the annual frequency used by Kraeussl et al. (2016). Third, we apply the Markov Switching ADF tests before using the right-tailed unit root tests to check for bubbles or not. Fourth, we subject the series to the three versions of the right tailed tests for bubbles, while Kraeussl et. al. (2016) use only one version. And fifth, we perform the tests by extracting the finite sample critical values by the wild and sieve bootstrap methods proposed by Harvey et al. (2016) and Gutierrez (2011)- methods that may be more robust in the presence of non-stationary volatility or facing small sample size. Finally, we include international indices that represent the performance of international art markets, and as a result, our contribution is more extensive than that of Kraeussl el al. (2016).

The findings are as follows: according to the MSADF, two regimes exist for all the indices, but no bubble is found to be present. However, in applying the right tailed ADF, we are able to identify more than one bubble-with most of the bubbles happening in the period 2002–2005. Two bubbles exist in the 19th Century market, the Contemporary market, Drawings market, Modern market, Prints, and the US market. The Post-war market shows more than one bubble with the latest starting in 2011. Our study falls in line of Kraeussl el al. (2016) finding of detecting more than one bubble in the majority of art sectors, yet our contribution covers more sectors and regions.

Our evidence calls into question the cause of these bubbles and whether these bubbles will be occurring again at a future date. The evidence can be related to what was documented by Pesando and Shum (2007) and Goetzmann and Spiegel (1995) on the art markets. They argued that collectors are willing to pay high prices for paintings because of their private value and pleasure, and suggested that art buyers are not speculators. The rise in prices caused by aggressive bidding of collectors might be corrected in the subsequent auction, which can cause a mean-reversion in their prices.[4] Another view is related to the overreaction of collectors and the 'stylistic' risk described in Goetzmann (1993), who stated that if there is a shift in investors' taste, it can cause large negative autocorrelations. In case of a positive shock for a particular work, the demand increases and buyers may overreact; however, when collectors focus on another work, valuation may drop significantly generating lower returns. Then the superior and expert knowledge of artworks could help to achieve a higher return than someone who picked auctioned piece by chance, with the systematic winners influencing collector's taste and pushing prices up. Finally, Frey and Eichenberger (1995) proposed that bubbles can be attributed to some microstructural and psychological factors with collectors being irrational and disregard financial valuation models. They argued that the art markets are characterized by: high transaction costs; inelastic supply; asymmetric information and short selling is impossible.

[3] For some applications of these tests, see for example Hu and Oxley (2017) and Shi (2017).

[4] The sale of Picasso print collection by Sally and Victor Ganz at Christie's auction in New York in 1997 provides an example. Bidders pushed the collection prices to beyond their fundamental values, while the later subsequent appearances of the five Picasso prints realized lower prices at auction.

The presence of bubbles in some sectors call into question their validity and explanation. Before the crisis of 2008, the Contemporary art category experienced a strong growth greater than other categories, with turnover increasing from 92 million Euros in 2002 to 915 million Euros in 2008 according to the Artprice publication. However, due to the financial crisis of 2008, the Contemporary art sector experienced the heaviest decline falling to nearly 378 million Euros in 2009. Then the markets were affected by the debt crisis that hit Europe in 2011. That led to the cut of cultural budgets and subsidies with many galleries closing. The markets also experienced a crisis of confidence when the prices of Contemporary art were influenced by the actions of the two auction houses Christie and Sotheby that abandoned price guarantees to sellers; cut guarantees; and stopped offering bargains on commission charges to sellers with tighten credit terms to buyers.

The Old Masters and 19th Century categories had some price increases but have not seen the same market exuberance as the other categories. China is the biggest holder of these segments, but in 2015, the Chinese market contracted and lost its position to the USA. That was triggered by the anti-corruption actions initiated by President Xi Jinping that impacted China's luxury sectors and its art market. As a result, many Chinese wealthy individuals refrained from making "extravagant" acquisitions. At the same time, the recent evolution of the Chinese stock market and the sharp slowdown in China's economic growth had an impact on the Chinese art market, with sectors slowing down. Yet, the Chinese art market recovered from this downturn. In 2016, the turnover for Chinese art auctions saw an increase of 8% since 2015, and that brought China to rank first worldwide in front of the USA.

Apart from the events after the 2008 financial crisis and the uncertainty surrounding the economic environment in recent years (The Trump election, the Brexit and Geopolitical risks), the art market nowadays has more competition and players due to its financialisation and dependence on the financial sector. The Internet use is another factor in making the market more transparent with a better match between supply and demand. These adjustments are reflected in an increased level of efficiency; an increase in the number of transactions; and a significant rise in the liquidity of artworks. The markets are becoming more competitive and offer investors attractive alternative investment vehicles and portfolio diversification options. Yet the art prices may be sensitive to any kind of uncertain information or unexpected events. Geopolitical risks (i.e., Trump Election, Brexit) and economic uncertainty engulfing the global economy may trigger speculation in the art markets, distort prices, increase market inefficiency and as a result may lead to the formation of bubbles.

The rest of the paper is organized as follows. Section 2 presents the literature review. Section 3 presents the methodology. Section 4 presents the data and empirical results. And section 5 presents our conclusions.

## 2. Literature review

An extensive literature has arisen in studying the returns on art investments and comparing that to the returns on financial assets. Studies were done by dividing the market into subject, style or geographical locations with the findings being mixed. Initial studies include Stein (1977), Baumol (1986), Goetzmann (1993), Buelens and Ginsburgh (1993), Pesando (1993), Chanel (1995), Mei and Moses (2002), Mei and Moses (2005), and Campbell (2008). Other studies were directed to the determinants and characteristics that influence the pricing of artwork and include those by Renneboog and Spaenjers (2013), Higgs and Worthington (2005), Agnello (2002), Kraeussl and Logher (2010), Nahm (2010), and Maddison and Pedersen (2008).

Using U.S. and U.K. auction prices for paintings sold between 1946 and 1968, Stein (1977) finds a nominal return of 10.5 percent compared to an annual nominal return on stocks of 14.3 percent for the same period. Baumol (1986) then finds that paintings had a lower