

Factors driving the contemporary art market: a quantitative analysis

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Abstract

This paper investigates the way the contemporary art market works through a quantitative analysis of the first 155 most famous contemporary artists in the world. It empirically confirms Rosen's Superstar model (1981) and the phenomenon of density dependence proposed by Adler (1985). Results on the sample show that: 1) the contemporary art market is a winner-take-all market subject to network effects; 2) the artist's international prestige increases with the number of collections; 3) the contemporary art market is driven by the "economy of attention" (Frank 1998): the quantity sold does not depend on notoriety but on the investments of the curator/investor; market success depends on cultural success (and vice versa); trend setters foster the "star system": exhibitions depend on quantity sold and collections.

Keywords: art market; network externalities; winner-take-all market; attention economy

Classification JEL: Z11, L15, L22

1. Introduction

There are no established rules underpinning the evaluation of works of art. Fluctuations in prices are continuous and unpredictable, because they are conditioned by a series of variables that are able to contradict all the possible scenarios (Besana 2003). It is not surprising that Baumol (1986) describes the prices of works of art as a "floating crap game". This is due to the fact that prices are not anchored to any objective element and therefore can unpredictably fluctuate based on unobservable changes in consumer tastes (Zorloni 2013). Criteria determining the value of works of art may relate to the artist and to his work. With reference to the first criterion, an important element is constituted by the artist's reputation, which consists of the persona he adopts, the wider movement of which he is an expression, and his nation of origin. Personal reputation is extremely important, generating a very high value for works of art by artists considered stars and generate a trash market for those of doubtful authenticity, which can be similar in appearance to authentic works. Reputation is built from the information that art historians, critics, curators and art dealers provide; this information results in the creation of the artist's brand (Zorloni 2005).

In the world of contemporary art, as pointed out by Thompson (2008), branding activities have led to the creation of strong brands, ranging from art dealers to museum-brands, and from auction house-brands, to collector-brands, not to mention of course artist-brands. With the decline of the traditional judgment criteria, which are based on technical quality and are therefore verifiable on parameters dictated by the academies, the assessment of artistic production, particularly contemporary production, has begun to depend more and more on refined market strategies, by making the added value deriving from the brand of the creator progressively more important than the intrinsic value of his work. The valuation of painters, such as the Afro-American Jean-Michel

Basquiat, who died from an overdose, the graffiti artist Keith Haring, who died from AIDS, or Jeff Koons, a former partner of a porn star he elected as his muse, has risen proportionally to the provocations or myths that artists have created around themselves. As Koon himself theorized: in a world where everything is based on money, price makes an artwork.

About the artist's sources, Rosen (1981) addressed this topic from a theoretical point of view, and Adler (1985) from an empirical point of view. Rosen's Superstar model explains artists' income as a function of their talent. The purpose of the model is to explain why the relatively few artists who earn enormous sums of money dominate the market through the activities they undertake. According to Rosen, small differences in talent determine big differences in earnings: "sellers of higher talent charge only slightly higher prices than those of lower talent, but sell much larger quantities; their greater earnings come overwhelmingly from selling larger quantities than from charging higher prices".

This model has been utilized by Adler (1985) to explain why the art consumer is not prone to a varied consumption, but prefers to focus on a few great artists. Also according to Adler, the existence of celebrities does not derive from the differentiation of talent, but from consumers' need to have a common culture and symbols to share. The creation of a star, that is the transformation of an artist into a symbol, begins when each consumer randomly selects a new artist to add to his basket from a group of equally talented artists. The initial advantage allows the selected artist to become popular, and because consumers need a culture and symbols to share, other consumers in turn will start to become interested and to purchase the artist's works of art.

Edgar Morin (2005) has traced the source of the star system to the beginning of the last century when the first group of film companies was formed in Hollywood, competing to conquer the domestic market and to confirm their place on the international one. Today this system also prevails in the visual arts industry, especially in the contemporary art market (Zorloni 2005; Queminn 2013).

In the era of marketing, entertainment and seduction, the economic exploitation of notoriety, in the context of mass production and ubiquity of the mass media, has given rise to a sort of "celebrity economy" (Turner 2004), characterized by three specific aspects. For artists, creators and personalities who are part of the star system, the difference in their compensation is often vastly greater than the difference in talent; the exploitation of glory extends beyond their original field of competence; the results, sometimes obtained more by chance than talent or specific training, are self-strengthening (Benhamou 2002).

A comparative study by Towse (1999) demonstrated the strong asymmetry in the authors and composers' copyright revenues. She also noticed the revenues were not enough to live on and that the stars tend to be the same as time goes. On this line of empirical research, Krueger (2005)

showed the increasing superstar effect in the pop music market in the US, where the 5% of the total artists obtained the 62% of the total income of live exhibitions in 2002 and the 82% in 2003.

Based on this evidence, this study examines the way the contemporary art market works. Section II explains in detail the influence of network externalities and positive feedback on the contemporary art market. Section III presents the results of empirical research that, considering the theoretical positions outlined above, has the objective of identifying whether if the art market is a winner-take-all-market subject to network effects and the most influencing variables driving the market. The last section offers general conclusions.

2. Network Externalities and Positive Feedback in the Contemporary Art Market

There are a number of markets where a large part of consumer spending ends up in the pockets of a small number of producers, while the majority of the producers earn little or nothing (Frank and Cook 1995). Although there is usually more than one winner, figuratively speaking the “winner-take-all” as Robert Frank and Philip Cook wrote. Contemporary artists operate in a “winner-take-all” market. There are thousands of contemporary artists all over the world offering high quality works, but only a few earn big incomes, while the vast majority cannot even earn a basic living from their works (or earn not enough to live by their work). As pointed out by Abbing (1989), this happens because people have a “limited star capacity”. People tend to remember the relevant details of only a limited number of products, such as product names or an author’s name. Other than the influence of the limited star capacity, network externalities also contribute to the emergence of the “winner-take-all” market.

It is possible to assume that the demand for contemporary works of art is characterized by indirect demand-side network externalities¹: the collectors’ utility - and thus willingness to pay - depends on the number of prestigious and influential collections the artist is already part of. A product (or technology) is said to exhibit network externalities when, for the individual buyer, the value of the product depends on the number of users who consume the same product (Varian 2003). For instance, if being the only collector of an artist can increase the private utility (the pleasure derived from admiring a painting), the social utility, on the other hand, grows as more famous collectors appreciate and share interest in the same artist.

¹ There are two types of network effects: direct and indirect. Direct network effects are produced when the number of users adopting the good affects the utility of the individual because he can interact with more people. Fax, telephone, e-mail, software applications grow in value with an increasing network of users. These effects are also called economies of scale on the demand side. Indirect network effects are instead produced when the user's utility depends not so much from being able to interact with a large number of other users, but rather than from the increased attention their product receives by the manufacturers (in this case the artists).

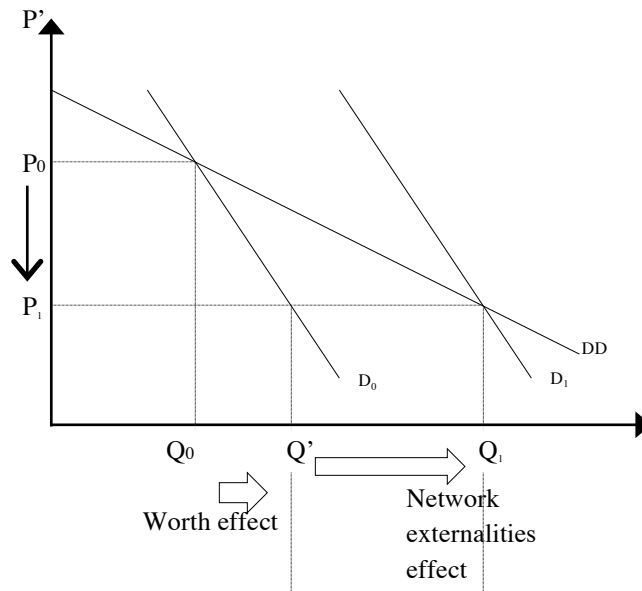
The influence of network externalities on demand can be defined and represented using Leibenstein's model (1948). This model allows us to estimate the demand function for a contemporary artist:

$$1) Q_{di} = f(P_i, n_a), \quad \frac{\partial Q_{di}}{\partial P_i} < 0, \quad \frac{\partial Q_{di}}{\partial n_a} > 0.$$

where n_a represents the total number of collectors, P_i is the price and Q_i is the quantity demanded of a product i .

If $n_a = n_0$, $Q_{di} = f(P_i) \Rightarrow$ corresponds to D_0 , $n_a = n_1$, $Q_{di} = f_1(P_i) \Rightarrow D_1$.

Fig. 1 – Network externalities in the contemporary art market



Source: Zorloni 2013

For, $n_a = n_1$, with, $n_1 > n_0$, the demand curve shifts from D_0 to D_1 and so on, until the increase of collectors causes the devaluation of the image of the artist and thus the emergence of a snob effect, i.e. negative externalities. The demand curve for collectors – namely the relationship that connects to each hypothetical level of price to the quantity that buyers are willing to buy - is obtained by considering the worth effect and the externality effect for each price. For example, if the price falls from P_0 to P_1 , the quantity of works of art demanded by collectors increases from Q_0 to Q' (worth effect): the appreciation of the artist by new collectors ($n_1 - n_0$) causes a further increase of quantity demanded from Q' to Q_1 (externality effect). This occurs because as the circulation of works of art in the network of renowned public and private collections increases, an increasing number of individuals will be encouraged to adopt the product, making the artist even more attractive to additional collectors and triggering the self-reinforcing effect (celebrity effect) defined above. In

this phase, the number of exchanges is growing and the new product (or the artist) is ‘adopted’ only by a few people who have a nose for novelty, love unusual things, have a high propensity to risk and a competence in the field. These are the innovators, the trend-setters, many of whom, if they are endowed with credibility or charisma, become trend setters. Examples of trend setters are Patrizia Sandretto Re Rebaudengo, Francois Pinault, Dakis Joannou, Ella Fontanals-Cisneros, Frank Cohen, Nicolai Frahm, Dasha Zhukova and Eli Broad who have founded their own private museums to expose their work along with cultural institutions of the caliber of MoMA or Tate Modern. If the artist is well received by them, he begins to conquer new institutions and collectors, and accelerates the process of mainstream adhesion (Vettese 1998).

This celebrity effect is the result of the new collectors’ common practice of reducing search and information costs by only purchasing recognized works or those by famous artists. By doing so, new buyers can rely on preferences established by previous successful buyers, hence reducing the risk and insecurity inherent in relying on their own taste. These risk-reducing techniques tend to reinforce the celebrity effect in the art market, whereby the works of the most famous artists are the most demanded and achieve the highest prices in the market, while emerging artists face high barriers to entry (Zorloni 2013).

In markets with network externalities, like the contemporary art market, competition appears to be particularly fierce at the initial stage because the achievement of the critical mass, triggering positive feedback, can lead to almost monopolistic positions with the inevitable consequence of informally creating reputational barriers to entry. Not only is the artist’s talent and ability to innovate is of great importance, but also the speed at which he grows, since the first artists who reach critical mass will conquer the entire market. In these competitive dynamics, expectations play an important role: the simple belief that a given artist will become the star of the market may cause an increasing number of critics to talk about him, media to cover him and collectors to buy him, making him indeed become the market celebrity. In this case, in fact, it is not necessarily the most valuable artist that achieves success: a minor artist can also succeed if there are wide expectations that this may occur. So, if an artist is willing to conquer a market with network effects, the most critical challenge lays in triggering positive feedback (Zorloni 2011).

On the dynamic of the adoption model, a pivotal role is also played by the “economy of attention” (Frank 1998). According to Frank, attention, and thus fame, in the cultural world is an economy working along the same lines as capitalism. The curator/investor (also the museum director or the gallery owner) acts as a financial investor and lends his property (his exhibition space and his fame) to an artist from whom he expects a return on his investment in the form of more attention (reputation, fame, etc.). Therefore, the relationship between the gallery owner and the artist relates

to that between the investor and the entrepreneur. The investor puts his money into companies from which he expects to gain rewards. This is always a mixed bag, where just a few artists succeed and pay for the investment in others who are lower achieving.

4. Empirical Research

4.1 Research Questions and Sample

Considering the theoretical positions outlined above, this section shows the results of empirical research conducted in order to verify the way the art market works and to identify a correlation (if any exists) between artists' fame (notoriety) and some of the variables suggested by the literature (Frey and Pommerehne 1989; Throsby 1994; Menger 2014) and between these variables. In particular, according to the literature review on artistic success and art market (Galenson 2002; 2005; 2006), we have formulated the following research hypotheses:

HP₁: The contemporary art market is a winner-take-all market subject to network effects, whereby “the strong become stronger and the weak become weaker”;

HP₂: The artist's international prestige increases with the number of collections he/she got in his/her career;

HP₃: The contemporary art market is driven by the “economy of attention”:

- *HP_{3A}: quantity sold does not depend on notoriety but on curator/investor's investments;*
- *HP_{3B}: market success depends on cultural success: turnover increases with notoriety (and vice versa);*
- *HP_{3C}: trend setters foster the “star system”: exhibitions depend on quantity sold and collections;*

To verify the research questions, the authors analysed a sample including the top one hundred and fifty five contemporary artists and photographers in the world in 2011, according to the ranking published by Artfacts². Since 1996, the British company Artfacts has developed a model classifying artists with respect to their degree of celebrity called “Artist Ranking”. The aim of the “Artist Ranking system” is to arrange artists by their exhibition success and define those who got more attention at an international level, and thus more visibility. Therefore, the database only includes artists who exhibit at international level. The Artist Ranking has been built in this way because only artists that are common to several countries and/or cultures will be very important and will therefore create a sort of sign or universal symbol (considered as a prototype). The final score describes the

² <http://www.artfacts.net/it/home.html>.

degree of recognition of an artist, and thus the strength of their brand within the contemporary art system. It depends both on the quality and quantity of his exhibitions. “It reflects how the artist is seen by the 'eye of the curator', sales are not an issue”³. The Artfacts score is calculated through assigning a reputation score to cultural institutions. Institutions gain reputation based on their past exhibition activity. This reputation (in points) is applied to their exhibitions. An artist exhibiting in this institution receives these points. The final score is calculated using an algorithm taking into account the artist’s shows (but not galleries and collections, see the next page), the reputation of the exhibitor and the number of countries the artist has been exhibited.

Data provided by Artfacts about the most famous contemporary artists in the world were integrated with data provided by Artprice⁴. Artprice is the world leader art market information provider from an economic and financial perspective.

4.2 Data Collection and Methodology

To test the research hypotheses, the study has taken the following variables into consideration:

1. “Artfacts score” (AS): an index of the artist’s visibility or notoriety level. This variable is used as a proxy for the artist’s cultural success. It is calculated weighting the number of “solo shows” (exhibitions) in respect to the “importance” of the exhibitor and the number of countries in which the artist has been exhibited.
2. “Change in visibility” (Variation of Artfacts score - CV): the increase or decrease in the artist’s visibility. It is expressed by the absolute difference in points earned by Artfacts with respect to the previous year;
3. “Artist’s living status” (L): dummy variable indicating if the artist is living (1) or not (0);
4. “Number of galleries” (NG): the number of galleries representing the artist and selling his works;
5. “Number of collections” (NC): the number of private or public institutions (museums) that have decided to buy and include in their collection at least one work by the artist;
6. “Turnover” (T): the artist’s annual sales value in US dollars in the secondary market (auctions). This variable is used as the most important proxy for the artist’s economic success;

³ <http://www.artfacts.net/tour/artist-ranking/>.

⁴ <http://www.artprice.com/>.

7. “Top Sale” (TS): the historical price record reached by an artist in the secondary market in US dollars (the reserve price of the artist’s demand curve);
8. “Number of lots sold” (NLS): the number of items or quantity exchanged in the secondary market;
9. “Unsold” (NS): the percentage of unsold items;

All the variables refer to the year 2011 (except “number of collections” and “number of galleries” which refer to the entire artist’s career). Data pertaining to the score and the score variation of the most famous contemporary artists were collected from the database Artfacts.net, as well as data relating “the artists’ living status”, “number of galleries”, and “number of collections”⁵.

“Turnover”, “top sale”, “number of lots sold”, and “percentage of unsold items” were collected from the Artprice.com database. Combining data from these two sources, the total sample is made of the top one hundred and fifty five world contemporary artists’.

First of all, we used a correlation matrix to understand simple linear correlation among the variables collected. Then the research hypotheses were tested using multiple linear regression models. The Standard Ordinary Least Square technique has been applied, as well as a test for multicollinearity (VIF Test) and homoscedasticity⁶.

4.3 Results

To verify HP₁ (the contemporary art market is a winner-take all market), the authors tested the following two models:

1) $AS_i = \alpha + \beta(CVi) + \gamma(Li) + \delta(NGi) + \eta(NCi) + \lambda(Ti) + \mu(NLSi) + \sigma(NSi) + \varphi(TSi) + \varepsilon_i$
 where the artist’s score (or visibility/notoriety/cultural success) depends on change in visibility, artist’s living status, number of galleries, number of collections, turnover, number of lots sold, percentage of unsold items, and top sale price.

Even using cross-sectional data and not panel data, according to results, HP₁ is accepted. Table 2 shows that, in our sample, the artist’s visibility (or cultural success) increases in line with change in visibility, number of collections, and turnover. In the eyes of the professionals (the artist score is valued according to them), if change in visibility is positive then visibility increases. It rises also

⁵ Notice that the Artist Ranking (“Artfacts score” or visibility or notoriety) is not calculated using the other variables provided by Artfacts.net (“variation of visibility”, “living status”, “number of galleries”, and “number of collection”) but only using the number of “solo shows” (excluded from the analysis).

⁶ Test for multicollinearity is applied to all the regressions in the paper. Results are in the tables. If no specified in the text, all the statistical tests are significant. Homoscedasticity has been evaluated using the scatter plot of the standardized residuals (*zresid) against the standardized predicted values (*zpred). There are some outliers, as expected. SPSS has been used to perform the quantitative analysis.

with collections and turnover. Cultural institutions drive notoriety but not the number of sellers (galleries). The more an artist is “on the scene” in museums the more his notoriety increases, as predicted by the “winner-take-all” theory. Moreover, market success (turnover) shows a linear influence on an artist’s cultural success (visibility). The artist’s score shows also a linear relation with the living status (higher notoriety if the artist is living): there is no “death effect” for the top contemporary artists (there are many famous living artists in the sample of the top 155). The model explains 83% of the total variance, it is significant (Prob. F=0.00), and there is no heteroscedasticity and multicollinearity (VIF<3.56 for all the variables).

$$2) AS_i = \alpha + \beta(CV_i) + \gamma(L_i) + \delta(NC_i) + \lambda(T_i) + \varepsilon_i$$

In model 2 the insignificant variables of model 1 are removed. R-squared does not significantly change: the model explains 81% of the total variance (and adjusted R-square is high too). According to the analysis of the standardized beta values, the most influential variables on artists’ visibility are the number of collections (0.66), change in visibility (0.17), turnover (0.17), and living (0.17) have the same relative influence: as literature suggests, the more an artist is showed, the more his notoriety increases and notoriety increase boosts notoriety again. The network effects work. Therefore, model 1 also tests and confirm HP₂: the artists’ international prestige increases with the number of collectors that decide to include a work of art in their collection. Cultural institutions’ decisions (public and private museums) about works of art exhibited in their collections (and not the number of sellers/galleries) influence visibility. This occurs because as the circulation of works of art in the network of renowned public and private collections increases, an increasing number of new buyers will be encouraged to include the artist in their collections, making the artist even more attractive to additional collectors and triggering the self-reinforcing effect (celebrity-effect).

Table 2

Ordinary least squares regression of artists' notoriety, most famous contemporary artists of the world, 2011

Dependent variable: Artifact score (or artist's visibility/notoriety)							
Model 1				Model 2			
	Unstdized coeff. β	Std error of β	Stdized coeff.		Unstdized coeff. β	Std error of β	Stdized coeff.
(Constant)	2729.972	1508.800		(Costant)	614.966	995.631	
Change in visibility	3.497**	1.009	.168	Change in visibility	3.500**	1.010	.169
Living	2532.641**	930.719	.132	Living	3299.378**	919.619	.172
N. galleries	-54.149	36.923	-.129	N. collections	191.207**	16.713	.662
N. collections	218.483**	20.453	.757	Turnover	7.205E-5**	.000	.177
Turnover	.000**	.000	.340				
N. lots sold	-.682	5.389	-.010				
Unsold (%)	-30.804	37.706	-.042				
Top sale	.000	.000	-.196				
N. of osserv. (N)	155 (8)			155 (4)			
F statistic (df)	0.00			0.00			
R-squared	0.830			0.816			
Adj R-squared	0.689			0.665			

Notes: model 1: all the VIF<3.622; Model 2: all the VIF<1.502; * p<0.005; **p<0.01

Data sources: Artfacts.net and Artprice.com

To test HP₃ (the economy of attention drives the contemporary art market), we run the following three models.

HP_{3A}: quantity sold does not depend on notoriety but on investments of the curator/investor.

$$3) NLS_i = \alpha + \beta(NG_i) + \gamma(T_i) + \delta(TS_i) + \varepsilon_i$$

The number of lots sold (quantity) increases with the number of galleries (sellers), turnover, and decrease with the top sale price. According to the standardized beta coefficients, sellers (galleries) and turnover exercise the stronger effect on quantity sold, respectively 0.56 and 0.46. All the other variables are not significant: notoriety, notoriety variation, living, number of collections, and percentage of unsold items are not able to explain the quantity of work of art sold (or there is not a linear relation). The total variance explained is 81% (R-squared).

Thus, HP_{3A} is confirmed: in the contemporary art market the quantity sold depends on number of sellers, turnover, and top sale items. Quantity increases as sellers and turnover increase, and decreases (a few) as top sale price increases, but the relative influence of top sale value is lower than the one played by the other two variables. The Frank's economy of attention theory is confirmed by data analysis: the more the curator/investor invests in an artist (increases

expositions/galleries), the more he/she sells his work of art, and the more the turnover increases, the more the quantity increases, increasing galleries (and turnover). The self-enhancing effect works.

Table 3

Ordinary least squares regression of quantity sold, most famous contemporary artists of the world, 2011

Model 3

	Unstdized coeff. β	Std error of β	Stdized coeff.
(Constant)	-21.557	11.340	
N. galleries	3.511**	.351	.564
Turnover	2.799E-6**	.000	.464
Top sale	-2.697E-6*	.000	-.150
N. of osserv. (N)	155 (3)		
F statistic (df)	0.000		
R-squared	0.810		
Adj R-squared	0.656		

Notes: VIF<2.76; * $p < 0.005$; ** $p < 0.01$

Data sources: Artfacts.net and Artprice.com

According to HP_{3B}, market success depends on cultural success: turnover increases with visibility.

To verify if turnover is explained by visibility, the following model has been tested:

$$4) Ti = \alpha + \beta(ASi) + \gamma(CVi) + \delta(LSi) + \eta(TSi) + \varepsilon i$$

This model explains 86% of total variance. HP_{3B} is accepted: turnover is linearly related to notoriety and its variation (negatively). As expected, it also depends on quantity sold, and top sale price. But it is uncorrelated to living status, exposition (galleries and collections), and unsold items. Increasing turnover does come together visibility/notoriety or cultural success but not directly on exposition in galleries. Thus market success of a work of art is explained by cultural success, which is fostered by exposition in collection, as theory predicts. The economy of attention works.

As expected, the most influential variables are top sale price and number of lots sold (respectively, standardized beta=0.55 and 0.32): both the quantity and the quality of the work of art show a huge correlation to turnover. In the contemporary art market, turnover increases not just with the number of pieces sold but also with the appreciation of the market, or the more the consumers' reserve price is. HP_{3B} is accepted.

Table 4			
Ordinary least squares regression of turnover, most famous contemporary artists of the world, 2011			
Model 4			
	Unstdized coeff. β	Std error of β	Stdized coeff.
(Constant)	-9179327.062	1578976.32	
Artfacts Score	526.766**	121.48	.214
Change in visibility	-5313.547*	2249.070	-.104
Lots sold	53637.405**	8126.964	.323
Top sale	1.650**	.143	.553
N. of observ. (N)	155 (4)		
F statistic (df)	0.000		
R-squared	0.860		
Adj R-squared	0.739		

Notes: VIF<1.40; * $p<0.005$; ** $p<0.01$

Data sources: Artfacts.net and Artprice.com

HP_{3C} (trend-setters foster the “star system”: exhibitions depend on quantity sold and collections) has been tested using the following model:

$$5) NG_i = \alpha + \beta(NC_i) + \gamma(LSi) + \delta(NS_i) + \varepsilon_i$$

The number of galleries the artist's is shown is correlated with number of collections, quantity sold and percentage of unsold items. It does not depend on visibility, change in visibility, living status, turnover, and top sale. The model explains 85% of the total variance. Trend-setters choose the artists to be sold according to their exhibitions in collections, to sold items and percentage of unsold items. Thus, they give space to more visible authors' (with more collections in museums), to the ones with higher sales and lower percentage of unsold items. The standardized betas demonstrate the quantity sold is the most important variable influencing the number of galleries the artist is present (std. B=0.51), in respect to the number of collections (0.45), and unsold items (0.16). The curator/investor looks at the number of lots sold (some market success) and at collections to decide the artist to be sold in galleries. HP_{3C} is accepted.

Table 5			
Ordinary least squares regression of number of galleries, most famous contemporary artists of the world, 2011			
Model 5			
	Unstdized coeff. β	Std error of β	Stdized coeff.
(Constant)	-.765	2.816	
N. of collections	.309**	.035	.450
Lots sold	.081**	.008	.506
Unsold (%)	.285**	.076	.163
N. of observ. (N)	155 (3)		
F statistic (df)	0.000		
R-squared	0.847		
Adj R-squared	0.718		

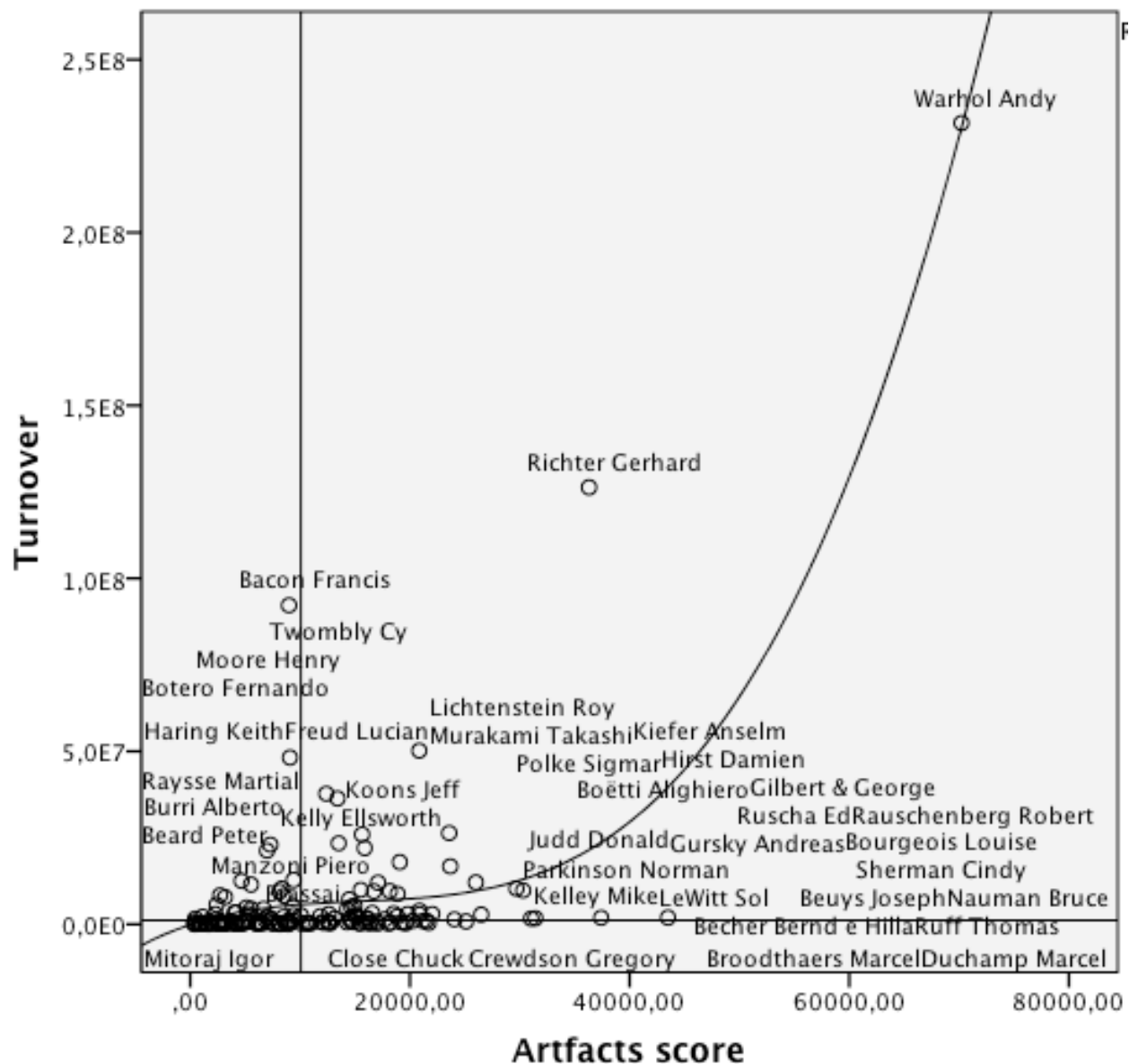
Notes: VIF<1.40; * $p<0.005$; ** $p<0.01$

Data sources: Artfacts.net and Artprice.com

The last data analysis pertains to the relationship between financial success and cultural success. Single regression (OLS) between turnover (used as a proxy for financial success) and the Artfacts score or notoriety (used as a proxy for cultural success) shows a strong cubic relationship ($R^2=0.63$; Sig. $F=0.00$); the more notoriety increases, the more turnover increases in a cubical way. Even excluding the five outliers in the dataset, the results do not significantly change and the relation stays cubical. Thus, cultural success, determined by notoriety, strongly increases financial success (HP1). And cultural institutions and/or investors boost visibility (HP3). The scatterplot makes clear that some artists are overvalued and others are undervalued (the straight lines in the graph are median values for financial success and cultural success). The overvalued contemporary artists are in the upper left quadrant: they have high financial success but low cultural success with respect to the first half of artists taken into consideration in this study. Some examples are Enrico Castellani and Agostino Bonalumi. The undervalued artists are in the lower right quadrant: they have high cultural success but low financial success. Some very visible artists, such as Sol LeWitt, Marcel Broodthaers, Thomas Ruff, and Marcel Duchamp, who do not have huge turnover, should have had a higher value on the basis of the preferences expressed by cultural institutions. These artists, together with many others, may represent a very good investment opportunity for the future. Nevertheless, it is necessary to point out that the majority of the artists placed in the lower right quadrant belong to younger generations with respect to those lying in the upper right quadrant. This may explain lower market quotations. If fame, notoriety, or even the simple interest of public institutions, dealers, museum directors and curators – here all included in the score that the artists received from Artfacts – proves a good indicator, some artists may have more interesting

performances in the coming years. On the contrary, those artists who were valued more than would be expected on the basis of the interest expressed by the critics (that is to say, positioning in the upper left quadrant) may start declining in the future or, in any case, enjoy weaker revaluations with respect to those in the lower right quadrant. Nevertheless, it is worth noting that, in the contemporary art market, aesthetic value and subsequent monetary value is greatly influenced by temporary fashions. This is due to the fact that historians and operators in this market have not yet been able to establish what is valuable and will last in the future.

Fig. 4 – Cultural success and financial success matrix, 2011



Data sources: Artfacts.net and Artprice.com

5. Conclusion

This paper represents a first attempt to empirically verify how the contemporary art market works. Going back to the research hypotheses, it is possible to draw some conclusions on the basis of the empirical evidence based on the 155 most famous contemporary artists in the world.

HP₁: The contemporary art market is a winner-take-all market subject to network effects, whereby “the strong become stronger and the weak become weaker”.

HP₁ has been confirmed in our sample. An artist's cultural success is highly correlated to his exposition (the number of collections), the variation in notoriety with respect to the previous year, living status and turnover. Thus, the analysis empirically supports the Rosen's superstar model (1981) and the hypothesis that a positive feedback in the market of contemporary arts leads to extreme situations, characterized by the international predominance of a few artists in the most important cultural venues with the subsequent creation of high entry barriers. The more an artist is exhibited (in private and public collections), the more his notoriety increases and notoriety increase boosts the chance to be selected again by other museums. Also, notoriety increases with turnover. The network effects work.

HP₂: the artists' international prestige increases with the number of collections.

HP₂ is also confirmed. Cultural institutions' decisions (public and private museums) about works of art showed in their collections (and not the number of sellers/galleries) influence notoriety, making the artist even more attractive to additional collectors and accelerating the process of mainstream adhesion. This celebrity effect tends to reinforce the same artists in the art market.

HP₃: The contemporary art market is driven by the “economy of attention”:

- *HP_{3A}: quantity sold does not depend on notoriety but on curator/investor's investments;*
- *HP_{3B}: market success depends on cultural success (and vice versa);*
- *HP_{3C}: trend setters foster the “star system”: exhibitions in galleries depend on quantity sold and collections;*

The research allowed verifying the density-dependence phenomenon put forward by Adler (1985). *HP₃* is confirmed. In the contemporary art market, quantity sold increases as turnover and sellers increase. Frank's economy of attention theory is confirmed by data analysis; the more the curator/investor invests in an artist, the more he sells the artist's work of art, the more the turnover increases, and the more the number of sellers increases. The self-enhancing effect works by showing that turnover is correlated to notoriety/visibility and sales; in turn, notoriety depends on change in visibility, collections and turnover. Since turnover is correlated to notoriety but not directly to expositions (or galleries/sellers), then the market success of a work of art is explained by

the cultural success, which is fostered by exposition. In fact, the number of galleries the work of art is exposed in depends mainly on collections (in public and private museums) and on quantity sold. Trend-setters make their choice about the artists to boost looking at their visibility and market success.

Finally, analysing the relationship between financial success and cultural success, it was found, as expected, that each strongly enhances the other (there is a significant cubical relation). Not forgetting that cultural institutions foster visibility, a scatterplot graph makes clear which are the overvalued and undervalued artists.

This study has a number of limitations. Panel data (data in different years) instead of cross-sectional data (data collected by observing the artists in the same year) would be more useful to test for network effects and would allow a deeper examination of competitive dynamics in the contemporary art market. In addition, the data are from a relatively small sample of contemporary artists. Having a huge number of less famous artists would give stronger results.

This is only a first attempt to empirically study the contemporary art market. A lot more empirical analysis should be done in the future to test the mainstream theory and to achieve a deeper knowledge of the way in which the contemporary art market works.

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