The liaison between European contemporary art institutions and superstar commercial galleries: a network analysis

Master Thesis

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ABSTRACT

The contemporary art world is characterized by a lack of objective criteria and quality uncertainty: different stakeholders cooperate and are mutually committed in the determination of art as such. Contemporary art institutions and commercial galleries involved in the primary art market are among its main contributors. Both exhibit and promote contemporary artists, but they differ essentially in their purpose. Institutions in fact are driven by a cultural aim whereas gallerists by a monetary one. This feature represents one of the cornerstones of the present art system. In fact, the independence of institutions' curatorial decisions appears to be crucial in the achievement of their mission and in their cultural role in the contemporary art world. However, this type of institution is characterized by cost disease and limited funds. Superstar commercial gallerists are then able and interested in backing exhibitions in order to increase their artists' visibility and, consequently, their market value. This phenomenon represents a clear threat to the well-being of the contemporary art world.

The present thesis in fact aims to detect a liaison between a small circle of superstar commercial galleries and contemporary art institutions in Europe. In order to do so, a quantitative method, defined as network analysis, is the most suitable in detecting ties between these two stakeholders. The dataset was set up by including living artists, and their respective intermediaries, that had major solo shows at a sample of 20 prominent European contemporary art institutions in the last decade.

The results gave empirical evidence of a tendency for these institutions in exhibiting artists represented by few superstar commercial galleries. These findings then trigger different interpretations: superstar gallerists can be seen as reliable and informed quality certifiers in the contemporary art system, undermining their institutional counterparts. Moreover, an economic, and more concerning, explanation regards the formal irruption of the market sphere on the institutional one. Superstar commercial gallerists, thanks to their outstanding turnovers, can represent a serious menace to the cultural authority of institutions involved in the contemporary art world. Undoubtedly, these two stakeholders are reciprocal in their essence but it is important to remark how they have to be necessarily independent of each other.

KEYWORDS: *commercial gallery, contemporary art, network analysis, superstardom, art institution.*

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1. INTRODUCTION

In the art world different stakeholders like critics, curators and gallerists cooperate and contribute to the definition of art as such and, therefore, in the legitimation of artistic careers. However, the contemporary art system is known to feature a lack of objective criteria and a commercialization process for which there is a blurred partition between high and low brow art (Velthuis, 2012). Consequently, its market can be described as a clear example of Akerlof's (1970) market for lemon, where asymmetry of information and quality uncertainty are ubiquitous. In this lack of certainties, gallerists, by operating as an intermediary in a two-sided market consisting of artists and collectors, perform as reliable gatekeepers and quality certifiers (Di Caro et al, 2020). Having said so, it can be understood how gallerists are covering a crucial and advantageous position in the current contemporary art system.

Commercial gallery can be differentiated from contemporary art institutions because of their mission: indeed, both promote and exhibit contemporary artists, but the latter are usually not driven by monetary goals, rather by a cultural purpose. This essential divergence constitutes the basis for the present research. In fact, because of the recent critical financial situation faced by contemporary art institutions, commercial galleries are more frequently sponsoring exhibitions for artists included in their roster. From a commercial perspective, the institutional representation of an artist in fact leads to an increase in the market value, thus benefitting the commercial gallery's turnover. It is

then blatant how intermediaries look with interest at institutions in order to boost the career of the artists they represent. Art dealers aim then to exert an influence and establish connections with curators and other cultural stakeholders involved in the contemporary art world. To this regard, an article by *The Art Newspaper* titled, "Almost One Third Of Solo Shows In US Museums Go To Artists Represented By Five Galleries", aimed at showing the prevalence of artists represented by Pace Gallery, Gagosian, David Zwirner, Marian Goodman and Hauser & Wirth in exhibition programming at American contemporary art museums (Halperin, 2015). Following that path, the present thesis intends to answer the following question:

Do we identify a liaison between a small circle of superstar commercial galleries and prominent contemporary art institutions in Europe?

This liaison has to be understood as between artist representation by commercial galleries and curatorial choices for contemporary art exhibitions in prominent European institutions. By employing network analysis, we will detect the existence and the intensity of ties between an elite of commercial galleries and institutions in the European contemporary art system. Ties that are described in form of solo shows in institutions by artists represented by main galleries. The content of the analysis is useful to address in a rigorous way the question of the independence of contemporary art institutions from prominent commercial galleries. The latter is reputed important to avoid conflict of interests and potential purpose-drifts at a cultural organizational level. Moreover, even if the art world can be described as a "big machine" where all the different components are mutual and necessary, the independence of these two stakeholders seems a sine qua non for its prosperity. The contamination of the commercial world with the institutional one is a clear threat to the role and validity of cultural institutions and their professionals, namely curators and cultural managers. The current thesis suggests that there is ground for such concerns, by providing evidence of frequent institutional exhibitions of artists represented by a restricted number of galleries. This information can be considered relevant insofar as it reveals a potential "liaison dangereuse" between the commercial and the institutional side of the contemporary art world. It is nonetheless beyond the scope of this investigation proving that galleries have been able to induce institutions to show their artists. Features of the art world, described in the analysis, may lead institutions to exhibit mainly famous artists who are likely to be represented by top galleries. However, there are many artists and more than few important galleries. It is, therefore, important for the goal of this thesis to detect how restricted is the set of galleries whose artists are shown in principal European institutions.

In order to highlight the source of the access of commercial players to the institutional side it is important to refer to a well-known phenomenon in cultural economics: namely, superstardom. The latter sheds a light on how in many labor markets, from lawyers to sportsmen, there is a highly skewed distribution of rewards for which a top segment of individuals have extraordinary salaries compared to other professionals working in the same industry (Rosen, 1981). The superstar effect has been considered as omnipresent in the cultural industries and in the artistic labor markets (Towse, 2010). This economic phenomenon is clearly detectable at a primary art market level: few commercial galleries promote and sell superstar artists since they built their reputation as trusted and informed gatekeepers. In fact, less than 5% are responsible for approximately 50% of the value of sales in the primary international art market, for which a small circle of gallerists can be indeed considered superstars because of their multi-millionaire annual turnovers (McAndrew, 2020). Superstar gallerists are then able to exploit their informational advantage and conspicuous funds in order to intervene on the institutional side with the aim to potentially distort the market as they wish. These commercial players can then afford to back art institutions, especially in virtue of the decreasing, both public and private, support recently experienced by this type of organizations.

The pivotal role played by gallerists emphasizes once more one of the cornerstones of the contemporary art world: the unavoidable process of marketization and commodification of art in its present-day system. If the predominance of the commercial sphere in the art sector is beneficial for the stakeholders involved in its markets, for cultural institutions this seems to be highly detrimental. A convergence, between market and institutions, can in fact easily mislead cultural professionals in the hierarchy existing in the cultural sector, for which economic activities have to be meant as supportive of cultural ones.

The thesis will be structured in the following way: in Section 2, the literature review will enable the reader to delve into the dynamics that rule contemporary art, on both the commercial and institutional aspects. In addition, two relevant concepts in cultural economics, namely network effect and superstardom, will be presented as pertinent to the present research. Successively, in Section 3, data will be explained, showing their geographic distribution and how they are set up in order to be calculated with the network analysis. An explanation of the latter is included in order to inform appropriately the reader about the method employed. In Section 4, results derived through the social network analysis software UCINET will be discussed. Section 5 will outline the limitations to the present study as well as future possible research on the topic. Section 6 will end the study by drawing few conclusions originated by the results.

2. LITERATURE REVIEW

2.1 Art world as a whole, as a human body

The art world can be described as a human organism, where all the different stakeholders represent its organs and are necessary and mutual for its wellbeing (Artland, 2019). In the art sector: institutions, gallerists, curators, critics and so on play a crucial role and cooperate in order to legitimate artists' careers (Baia Curioni et al, 2016). To this regard, sir Alan Bowness (1989), noticed four stages behind an artist's recognition. According to him, the legitimization of an artist proceeds progressively through the recognition by the peers, by the critics, by the market and so by gallerists and, in the end, by the broader public (Bowness, 1989). Rather than following a step-by-step path, Bonus and Ronte (1997) argue that artistic legitimation is a collective act, given by a group of insiders who share specific knowledge, defined as cultural. This specialized and idiosyncratic common accord defines the quality of an artist's oeuvre and its consequent market value (Bonus and Ronte, 1997). For instance, even the superstar gallerist Leo Castelli, despite its fame, had to be supported in his artists' selection and promotion by other stakeholders in the art world, such as The Biennale in Venice or Documenta in Kassel (Bonus and Ronte, 1997).

Gatekeeping and selection strategies are then a collective phenomenon that cannot be ascribed to individuals: in fact, art is jointly produced by cooperating and competing agents influenced by their social context (Foster et al, 2011). According to the value-based approach, art can be defined as a common practice, as a shared good (Klamer, 2016). These types of goods are co-created and co-produced: only people who are willing to contribute and participate are able to benefit from it (Klamer, 2016). Art then becomes as such by being shared and co-created by all its stakeholders; in fact, the latter have to be understood as those who are able and willing to be involved in the artistic conversation (Klamer, 2016).

2.2 The contemporary art system and its dynamics

It has to be pointed out how the art system, since the end of the past century, has experienced a change in its driving forces. Velthuis (2012) and Lind (2012) highlight how

globalization and commercialization have invested the whole sector. In relation to the first topic, Quemin (2012) claims that the prominent entrance of BRIC countries in the market has not undermined the Western hegemony. In fact, there is empirical evidence of how the art market still has London and New York as its capitals, while the other cities act as peripheries (Quemin, 2012). Furthermore, not only Western cities still dominate the market, but also artists from Western countries seem to be the most represented at the main art fairs. As Baia Curioni et al. (2015) have noticed, at the 2005 edition of Art Basel, Western Artists were 85,5 % of the share of all the artists present at the Swiss art fair. Against these perspectives, Yogev and Ertug (2011) and Pownell (2017) remark how, in the first decade of the century, Asian countries, such as China and Hong Kong, had increased their lead in the international art market panorama. In 2017, in fact, Asia had the 40% of the international auction houses sales and, in 2010, China was defined as the second biggest contemporary art market after the US, overtaking Great Britain (Pownell, 2017; Yogev and Ertug, 2011). Despite these opposite views, it has to be pointed out how the current art market is highly fragmented, meaning that it is more convenient to define it as an international one rather than a global (Renneboog and Spanjaers, 2015). This fragmentation is revealed by how prices are dependent and affected by the sale's location without following global common patterns (Renneboog and Spanjaers, 2015).

The second noticeable phenomenon in the contemporary art world is its process of commercialization. Indeed, one of the main reasons behind it can be detected in artists' atelier managed as enterprises (Van den Berg and Pasero, 2012). Superstar contemporary artists, such as Jeff Koons or Olafur Eliasson, have employed large scale formats for their artworks that can be associated with a new form of monumentalism (Van den Berg and Pasero, 2012). In this way, the atelier started to employ a large number of workers and to be managed by the artists as a firm, with art fabricators studios, like Prototype NY, emerging as new stakeholders in the art world (Van den Berg and Pasero, 2012). From emerging art studios, such as the one by the Italian artist Edoardo Tresoldi, to the 250 workers employed by Damien Hirst, contemporary ateliers are in toto enterprises that can require turnovers of millions in order to be sustainable (Cascone, 2018). The Romantic idea of the lone artist seems, therefore, to be replaced by one of a cultural entrepreneur who delegates the physical artistic production and is financially backed by his or her own intermediary (Enhuber, 2004; Van den Berg and Pasero, 2012).

In relation to the current trend for large-scale artworks, it has to be remarked, how, in the 70's, Richard Serra's sculptures were received as a scandal by art connoisseurs and a cultural

ostracism towards monumentality was spread throughout the whole sector (Van den Berg and Pasero, 2012). However, nowadays, Richard Serra is considered among the greatest artists of our time, with its artworks permanently exhibited in top contemporary art institutions, like the Guggenheim in Bilbao or the Museum Voorlinden, and his installations fetching millions at the main auction houses (Embuscado, 2016). Indeed, these large-scale projects allow contemporary artists to create an impact and a space for visitors' participation (Schneemann, 2013). Contemporary large scale artworks aim then to a co-production of the experience, giving to cultural consumers a feeling of collectivity (Schneemann, 2013). This call for impact remarks once again the relevance of emotions and perception rather than the one of intellectual interpretation in contemporary art (Schneemann, 2013). Thus, it is no surprise that superstar contemporary artists have recently come up with projects like KAWS' *Companion* in the Hong Kong Harbor or Damien Hirst's *Demon with Bowl*.

The branding strategies, followed by an effective commercial propaganda, clearly weakened the distinction between low and high brow art in the current system (Velthuis, 2012; Van den Berg and Pasero, 2012). In fact, the commercialization process is also fostered by the cross-sectoriality of the art sector with other cultural industries (Velthuis, 2012). The artworld is living a period of contamination by other industries such as the one of fashion, for which artists are brands and the main art fairs are becoming glamorous events analogous to the fashion weeks (Velthuis, 2012). This process of commodification reminds us then to Marx's (1867) art fetishism and, to the subsequent, Marxist theory of Culture Industry, as proposed by Adorno and Horkheimer (1940). The loss of autonomy of the art sector has slowly overshadowed the concept of art for art's sake. Contemporary art and commerce are thoroughly linked and it is no coincidence that collaborations, such as the one between Louis Vuitton and Takashi Murakami, have been established, lasting for years (Ghorashi, 2015). Moreover, the cross-sectoral relationship, between fashion and art, is evident in the rising numbers of private foundations, owned by big fashion brands, committed in exhibiting and promoting contemporary art (Cassidy et al, 2018). Contemporary art is gaining then a crucial role in luxury fashion marketing: these foundations, by operating as common platforms for public engagement and branding, try to generate inclusiveness in two sectors often considered highly exclusive (Cassidy et al, 2018).

Because of this emphasis on the commercial side of the contemporary artistic production, it is now necessary to investigate and remark the relevance of intermediaries in the present art system.

2.3 Gallerists as gatekeepers and pivots in the contemporary art world

The contemporary art market is a two-sided one where gallerists operate as intermediaries between buyers, the collectors and producers, the artists (Di Caro et al, 2020). In the primary segment of the market, complete informations and quality certainties are hardly present, for which this peculiar market can present the typical issues of the Akerlof's (1970) market for lemons (Caves, 2000). In order to overcome these issues, the intermediary act as a quality indicator. She reduces search and transaction costs for buyers and is committed in promoting and fostering artistic careers (Di Caro et al, 2020). Galleries are necessary for the market's efficiency, they are operating for the sakes of both the parties involved (Di Caro and Mazza, 2019). Dekker (2015) points out the relevance of intermediaries in the market for cultural goods for their ability to deal and justify notions of value. Moreover, gallerists are determinant for the emergence of artists: they scout, promote and sell new talents to collectors, acting as quality certifiers and price setters (Di Caro and Mazza, 2019). Concerning the last task, it seems that there is no systematic explanation behind the price setting of emerging artists at their first sales. Gallerists are then gatekeepers as well as market markers (Di Caro et al, 2020); they have to be committed in building and investing on their reputation among all the different stakeholders: to this regard, an emblematic example is represented by the costly participation to the most prestigious art fairs, such as Art Basel and Frieze.

Art fairs have outstandingly increased in the last decades: from the first modern art fair, held in Cologne in 1967, Baia Curioni (2012) reports how in 2011 we could count 189 fairs and approximately 100 of biennials throughout the globe. Despite their function as temporary markets, these gatherings are a fruitful investment for galleries in terms of reputation and networking: their presence at the event is a signal of quality and it is where, in addition, they can reinforce their relationships with curators and collectors (Velthuis, 2014). By increasing the level of trust, a gallery will shape its role in the primary art market as a valuable and informed gatekeeper and, eventually, as a market maker (Di Caro et al, 2020). Prinz et al (2015) have conducted an empirical analysis on the main determinants for the success of galleries in the German primary market. In their results, successful galleries seem to be strongly innovative and forward-looking in terms of new artistic trends (Prinz et al, 2015). Innovativeness and informational advantages are then the main rationales behind intermediary success in a market dominated by information asymmetry and quality uncertainty (Prinz et al, 2015; Di Caro and Mazza, 2019).

Success in the primary art market is due to the high search, inspection and entrance costs that galleries have to face in order to acquire their legitimate position as informed intermediary (Prinz et al, 2015). As Bonus and Ronte (1997) have explained, a gallerist has to scrutinize hundreds of emerging and less known artists before decide which one to exhibit and promote. Inspection, search and set up costs are crucial in determination of an artist potential and justify high charges by galleries (Bonus and Ronte, 1997; Di Caro and Mazza, 2019). Inspection costs are, for instance, visit to art academies, atelier visits or meetings with curators (Di Caro and Mazza, 2019). As previously explained, artistic legitimation is given by manifold interrelations resulting in a process of co-production; gallerists are, therefore, aware that they need to promote and give visibility to their artists through multiple channels. Consequently, the gallerists are omnipresent in the whole artistic development: in order to shape an artist's career, they are willing to back their artistic production as well as their representations in institutions (Di Caro and Mazza, 2019).

Concerning the support to artistic production, emblematic examples are Berswordt-Wallrabe financially supporting all Richard Serra's major artworks and Gagosian giving an outstanding contribute of 65 millions USD to Damien Hirst for the production of the *Treasures from the Wreck of the Unbelievable*, a major solo show held at Palazzo Grassi, Venice in 2017 (Van den Berg and Pasero, 2012). By backing and financing shows, gallerists are investing in the co-legitimation process crucial in the development of an artist's reputation (Di Caro and Mazza, 2019). Indeed, representation in a well-recognized cultural institution boosts the demand for the respective artist, increasing his or her prices (Di Caro and Mazza, 2019). Funding exhibitions in contemporary museums have benefits for all the parties involved: the institutions can solve their cost issues, whilst the artist gains visibility and, consequently, the gallery fetches higher prices. According to the *New York Times*, these contributions can vary from 5,000 to 200,000 USD: exemplary cases of this practice are the 2016 Frank Stella's retrospective, jointly financed by his two intermediaries Lévy Gorvy and Marianne-Boesky or the Takashi Murakami major solo show organized in 2007 at the Los Angeles Museum of Contemporary art (Pogrebin, 2016). Thus, it does not surprise us that 11 out of 12 of the major solo shows at Solomon R. Guggenheim from 2007 to 2013 were exhibiting artists represented by the top five galleries: Gagosian, Hauser & Wirth, David Zwirner, Pace and Marian Goodman. A more comprehensive research conducted, in the same range of time on approximately 600 exhibitions hosted in 68 American museums, showed how 30% of the major solo shows featured artists promoted by the same top five galleries. If, for instance, the MoMa cannot accept direct support from galleries to finance exhibitions, that seems not to be the case for

most of the museums in the US (Halperin, 2015). Institutional figures in the American art world, such as Robert Stirr or Jeremy Strick, have commented on this convergence with worry (Pogrebin, 2016).

Another study highlighting how these two stakeholders are heterogenous in the contemporary art world is the one conducted by Baia Curioni and Rizzi (2016): in fact, they decide to consider 34 worldwide contemporary art institutions exhibitions, in the period 2005-2013, and artists represented at Art Basel editions from 2005 to 2012. The results support the hypothesis that the two agents share similar choices and that a phenomenon of overlapping is present, at least in the top segment of the contemporary system (Baia Curioni and Rizzi, 2016). This convergence can be explained by a shift in the art's driving forces: from dealer to critics, to dealer to collectors (Baia Curioni and Rizzi, 2016). However, representatives of top contemporary art institutions, such as the Serpentine or Tate, claim that commercial partners are not involved and do not have any sort of influence in curatorial decisions (Shaw, 2020). On the other hand, art dealers, like Ivor Braka, remark how there is no conflict of interest if a gallerist pitches ideas for an exhibition or is in the board of a museum (Shaw, 2020). If gallerists are then more willing to be associated with the institutional side of the artworld, curators strive for their independence. This is due to the difference in nature of the organizations that they represent and to their scope and role in the art sector.

2.4 Independence of contemporary art institutions

In order to understand how a convergence of interests between art institutions and commercial galleries can represent a potential threat to the whole system, it is important to understand the nature and goals of these two stakeholders that are at the core of the present research. Art institutions, such as museums, differ from standard profit enterprises because they have a hybrid nature, they entail both financial and cultural activities (Do Carmo, 2019). This sort of organizations have a defined cultural mission, or purpose, for which, within the cultural domain, the hierarchy between the two activities is well defined. Even if the financial, or support, activities are there to serve the cultural ones, they are fundamental in the sustainability and achievement of the cultural purpose (Do Carmo, 2019).

We can see how museums' mission statements express what is their goal and how they are clearly aiming at the realization of certain cultural and educational values, like for instance in the case of MoMa: "Founded in 1929 as an educational institution, The Museum of Modern Art is dedicated to being the foremost museum of modern art in the world. Through the leadership of its Trustees and staff, The Museum of Modern Art manifests this commitment by establishing, preserving, and documenting a permanent collection of the highest order that reflects the vitality, complexity and unfolding patterns of modern and contemporary art; by presenting exhibitions and educational programs of unparalleled significance; by sustaining a library, archives, and conservation laboratory that are recognized as international centers of research; and by supporting scholarship and publications of preeminent intellectual merit. Central to The Museum of Modern Art's mission is the encouragement of an ever-deeper understanding and enjoyment of modern and contemporary art by the diverse local, national, and international audiences that it serves." (MoMa, n.d). Art museums then are aiming at the realization of artistic goals, in researching, exhibiting and informing the audience about a certain specific author or period in art history from an institutional perspective. It is clear how, in the current society, these organizations are facing issues in balancing and harmonizing their dualistic nature, consisting of financial and artistic practices. In the museum sector, usually, managerialism and marketization are listed among the main sources of purpose-drifts, where cultural activities are threatened by the support ones (Do Carmo, 2019). More in general, in the whole not-for-profit sector, the organization's mission is sometimes neglected because of the market failure present in these industries, causing that professionals focus excessively on the endowments (Jones, 2007). Museum professionals then have to bear in mind that the support activities are fundamental but, ultimately, a tool to achieve a final goal, rather than the goal itself (Do Carmo, 2019).

Because of their purpose, cultural firms are usually presenting a not-for-profit or governmental organizational structure. Many cultural economists are in favor of the not-for-profit model as an optimal one for this kind of organization (Frey, 1994; Caves, 2000; Netzer, 2011). In fact, this status allows them to focus on providing high-quality cultural goods and benefits to society at large (Caves, 2000). Moreover, conversely to a governmental type of administration, the not-for-profit model enables them to be flexible in terms of management as well as to receive financial support by both private and public agencies (Netzer, 2011).

Concerning our topic, we can claim that contemporary art institutions and for-profit galleries are both determinant players in the "art game", sharing the same commitment in promoting the

current artistic trends; however, they differ substantially in their role and scope. As previously mentioned, commercial galleries contribute to make the whole art market more efficient, by connecting artists and buyers they are for-profit privately owned firms (Di Caro and Mazza, 2019). Their task is primarily linked to the market, even if the recent shift in the artistic legitimation to a dealer/collector logic blended their intermediation role with a gatekeeping one (Baia Curioni and Rizzi, 2016). If we consider the art market, cultural institutions have always played a cultural and gatekeeping role in artistic validation, providing informational balance and operating as a sort of rating agency (Baia Curioni and Rizzi, 2016). The respective independence of these two stakeholders seems then a fundamental component for the efficiency of the whole system so to avoid speculative bubbles and strengthen the reliability of contemporary art institutions (Baia Curioni and Rizzi, 2016).

What are then the main rationales for this confluence of commercial galleries in the institutional, not-for-profit, side of the art world? In the UK, for instance, it seems to be due to increasing cut in public fundings and to stricter scrutinies for donations, like those made by fossil fuel and big pharmaceuticals corporates (Shaw, 2020). Commercial galleries, but also major auction houses, saw this lack of funds as a perfect opportunity; as stated by Oliver Barker, the chairman of Sotheby's in Europe: "Museums are really struggling, that's why we step in" (Shaw, 2020). This financial crisis on the institutional side even led the two historical art market competitors to collaborate; the British gallery Offer Waterman and the auction house Phillips were in fact main sponsors in *Lucian Freud: the Self-Portraits* held in 2019 at the Royal Academy of Arts, as it can be seen on the cover page of the present thesis.

The reduction in public and private corporate support to art institutions is then a serious threat not just to their institutional autonomy but also to their survival, especially after considering how art museums have on average limited budget compared to other types of museums. In this regard, a recent study on 500 museums, made by the UK based art startup Vastari, demonstrates how 23% of science museums, against the 7% for art museums, have a budget that exceeds 100,000 USD for temporary exhibitions; even though art shows often involve higher production and logistical costs (McGivern, 2019). Furthermore, Vastari made an estimation of the average budget for the production of a three-month exhibition: science museums generally seem to have 80,000 USD whereas art museums less than 45,000 USD (McGivern, 2019). If public expenditures towards the museum sector are already low and progressively decreasing, art museums are likely to be the most affected by these cuts and in need of alternative sources of funds. To this regard, emblematic

cases are represented by the UK and the US. In fact, the British government has reduced by 13% its funds to museums, from 829 million pounds to 720 million in the decade 2007-2017 (Pickford, 2018); whereas Trump addresses the National Endowment of the Arts only 160 million USD, against the 940 billion in military expenditures, from its 4,75 trillion budget for 2020 (National Endownments of the Arts, 2020; the balance, 2020). The ICOM, following the fire that devastated the National Museum of Brazil in 2018, expressed its concern about this global trend in the reduction of public investment in the museum sector, seen as a true menace for its sustainability (ICOM, 2018).

Commercial galleries seem then to fill this monetary gap by sponsoring exhibitions for their artists in order to increase their recognition, their visibility, and thus their market value. This mechanism is the output of the current problematic period faced by art institutions for which the market is slowly contaminating the curatorial and critic side of the art sector. Not surprisingly, Lisson Gallery's curatorial director refers to its rapport with the institutional side of the contemporary art world as one of "genuine interdependence" (Shaw, 2020). It can be argued that the traditional interrelation among the different stakeholders is beneficial for the entire art world as long as their roles are clearly distinct and do not overlap. In order to notice these mutual relationships, an empirical method defined as network analysis is often employed by scholars interested in the art market and its dynamics.

2.5 Network effect and its externalities as the base of the art market

As aforementioned, galleries operate in a two-sided market which features a network externalities (Di Caro et al, 2020). The latter can be defined in the following way: "Network externality has been defined as change in the benefit, or surplus, that an agent derives from a good when the number of other agents consuming the same kind of good changes" (Liebowitz and Margolis, 1998; p.761). The art market, as a two-sided one, is characterized by cross externalities, or indirect network effects, which usually are monetary in nature and thus should not be internalized (Di Caro et al, 2020; Liebowitz and Margolis, 1998). In practice, artists want to be promoted by galleries with a large base of collectors, so that they choose their intermediary based on the other network side and vice versa (Di Caro et al, 2020). In addition to indirect network effects, also

positive or negative direct effects are present on the primary side of this peculiar market, meaning that galleries' pricing decision has to consider both (Di Caro et al, 2020).

If the market presents these direct and indirect networks effects and if the whole art system is reciprocal and conjunct, a network analysis can give us empirical and graphical evidence of this system of connections. An art fair, such as Art Basel, seems the perfect venue where these network activities take place, for which they have usually been at the core of network analysis studies made by scholars investigating the art market (Baia Curioni et al, 2015; Baia Curioni and Rizzi, 2016; Boari and Corrado, 2007). In their analysis, Baia Curioni et al. (2015) examine the network among international galleries at Art Basel, their role in the consecration of an artist and see geographic characteristics of the players at the core and at the periphery of the Art Basel network. To do so, they focus on the degree centrality of both artists and galleries in order to check to what extent the art market is still Western-dominated (Baia Curioni et al, 2015). The results illustrate how, from 2005 to 2012, there has been a higher inclusion and centrality for artists born outside the traditional Western scenes, with an overall amount of 99 nationalities of artists present at Art Basel fair 2012 edition (Baia Curioni et al, 2015). In this research, a high degree for an artist, and its consequent central position in the network, is due to the fact that is shared by many galleries or by galleries with a wide or shared program (Baia Curioni et al, 2015).

In their study on the convergence between the market and the institutional side, Baia Curioni and Rizzi (2016) compare the centralities of the Art Basel network and the one of a sample of 35 influential contemporary art institutions at a global level to see to what extent the two diffusions of artists are coinciding and overlapping. The results show how the group of artists present at Art Basel corresponds to the curatorial picks of these prominent contemporary art museum considered in the study (Baia Curioni and Rizzi, 2016). In addition, an artist who is represented by a larger a number of intermediaries at Art Basel in the period 2005-2012 is also the one who, in the same range of time, has been exhibited more on the instutional side and vice versa (Baia Curioni and Rizzi, 2016). The latter findings on the convergence of artistic choices and representation at Art Basel does not surprise us, it actually would be strange the contrary. What seems interesting is to investigate to what extent artists exhibited at contemporary art institutions are represented by a small circle of top, or superstar, commercial galleries.

2.6 Superstardom as an ominpresent phenomenon in the art world

Following what suggested by Halperin's (2015) article in *The Art Newspaper* on the link between the programs of five top commercial galleries and American museums, the present research aims to give empirical evidence on whether we can identify a similar liaison between top contemporary art institutions in Europe and main superstar commercial galleries through network analysis. Superstardom is an economical phenomenon for which a "short head" of workers earn outstanding salaries compared to a "long tail" of colleagues operating in the same market (Rosen, 1981). The superstar effect has been detected in different occupations, from lawyers to football players, but especially in the artistic labor market and the creative industries because of its correlation with the notion of talent (Towse, 2010; Rosen, 1981). Concerning the present research, superstar commercial galleries, by being privately owned, are the ones who fetch high prices and have multi-millionaire turnovers. An article published by *Forbes* reports estimates made by the art advisory agency Linn|Press for the 2011 revenues of the top 10 most powerful American gallerists in the world (Noer, 2012). According to the business magazine, superstar American gallerists, present in the ranking and involved in the primary art market, were the following: Larry Gagosian with 925 million USD of estimated revenues, followed by Arne Gilmcher from Pace Gallery with 450 million USD and by David Zwirner with Iwan Wirth from Hauser & Wirth both sharing the lowest step on the podium with 225 million USD (Noer, 2012). In the top 10, there are present also gallerists such as Marian Goodman with revenues for the year 2011 of 150 million USD, together with Matthew Marks, Paula Cooper, and Barbara Gladstone respectively with 100 million USD of estimated revenues (Noer, 2012).

In a nutshell, this study aims at shedding a light on the connection that world-known superstar galleries may have with European cultural institutions regarding artistic representation. The result shows a prevalent attention of institutions to artists represented by a small circle of galleries. On the one hand, this result reinforces the idea of a superstar effect omnipresent in the art world, on the other, it is a warning that curatorial autonomy is concretely threatened: gallerists, thanks to their informational and economical advantage, show to have gained the pivotal role of gatekeepers in the whole contemporary system, undermining their institutional fellows.

3. DATA AND METHODOLOGY

3.1 Data collection

In order to start the data gathering, it was necessary to define which European contemporary art institution can be considered most prominent. According to Frey (1998), superstar museums are the ones who are able to attract yearly a large number of visitors. I decided then to consider European museums that hosted the most visited contemporary art exhibitions in 2018, as published in the Art Newspaper report (2019). Assumed this criterion, the top 20 European contemporary art institutions in terms of visitors are, in alphabetical order, the following: Barbican, Centre Pompidou Metz, Centre Pompidou Paris, Fondation Beyeler, Fondation Cartier, Fondation Louis Vuitton, Garage Museum of Contemporary art Moscow, Guggenheim Bilbao, Hamburger Banhof Berlin, Hayward Gallery, Kroller Muller, MAXXI, Museo Reina Sofia, Palais de Tokyo, Royal Academy of Arts London, Saatchi Gallery, Serpentine Gallery, Tate Modern, Upper Belvedere, Whitechapel Gallery.

Furthermore, in the dataset, I included living artists born after 1930 that had solo exhibitions in the period 2010-2019 at the just reported institutions. The data gathering led to a final dataset consisting of 396 contemporary living artists born after 1930 that had solo shows at the aforementioned 20 prominent European contemporary art institutions in the last decade. Specifically, I took into consideration only visual artists who are represented by commercial intermediaries. The chronological list of exhibitions was outsourced by ArtFacts.com. Commercial galleries representing each artist were found online on their CVs or on the artists' website under the page "Contact" and reported in the dataset.

With regards to the commercial galleries representing these 396 artists, an overall amount of 217 intermediaries has been reported in the dataset. The final list with all the 217 commercial galleries in the dataset, their nationality, Degree and Eigenvector Centrality scores can be found in Appendix 1. Using the terminology pertinent to the social network analysis, the final network presents 1047 ties and 633 nodes (396 artists, 20 European contemporary art institutions and 217 commercial galleries). The Excel sheet was organized in form of square-matrix with artists on the columns and the contemporary art institutions and commercial galleries in the rows. An example of how the dataset was set up can be seen in Appendix 2. If an artist had an exhibition at a specific institution in the range of time 2010-2019 or it is represented by a commercial gallery, the presence

is indicated with 1, its absence with 0. Another dataset has been created with the commercial galleries' nationalities, continental area of origin and Degree Centrality scores, in order to compute descriptive statistics.

3.2 Geographic distribution of the data collected

The geographic distribution of the 20 European art institutions sample considered in the study is the following: 7 are located in the UK, 5 in France, 2 in Spain, 1 in Switzerland, 1 in Russia, 1 in the Netherlands, 1 in Italy, 1 in Austria and 1 in Germany, as reported in Table 1. So, although the sample is rather international, there is an overrepresentation of British and French institutions, accounting for 60% of the sample.

Table 1. Geographic distribution of the 20 European contemporary art institutions in the dataset

Institution	Country
Barbican, Hayward Gallery, Royal Academy of Arts London, Saatchi Gallery, Serpentine Gallery, Tate Modern, Whitechapel Gallery	United Kingdom
Centre Pompidou Metz, Centre Pompidou Paris, Fondation Cartier, Fondation Louis Vuitton, Palais de Tokyo	France
Guggenheim Bilbao, Museo Reina Sofia	Spain
Fondation Beyeler	Switzerland
Garage Museum of Contemporary art Moscow	Russia
Kroller Muller	Netherlands
MAXXI	Italy
Upper Belvedere	Austria
Hamburger Banhof Berlin	Germany

Concerning the nodes that are at the core of the present research, namely the 217 commercial galleries, it can be useful to divide them by continent and to see whithin the European

one which country tend to have commercial galleries with a high representation on the institutional side of the contemporary art world. The nationality of the gallery refers to where it was founded, thus where its first space is located and where it mainly operates, as described on their ArtFact.com pages. From a macro-geographic perspective, almost all the 217 commercial galleries in the dataset are from the Western part of the globe: in fact, approximately 94% of them were established in Europe or in the Americas. A geographic distribution by continental area can be seen in Table 2. For convenience, Middle East and Africa are paired under the term "MENA" and the Latin American area includes both South and Central America.

Table 2. Geographic distribution by continental area for the 217 commercial galleries in the dataset

Continental area	Commercial galleries (total)	Commercial galleries (%)
Europe	150	69.12%
North America	49	22.58%
MENA	6	2.76 %
Asia	6	2.76 %
Latin America	4	1.84 %
Oceania	2	0.9 %

Among the 150 European commercial galleries, the UK dominates the chart with 38 commercial galleries representing artists that had exhibitions at the 20 contemporary art institutions, as shown in Fig.1. The value itself is probably influenced by the fact that 7 institutions are located in the UK and that the establishment of informal and non relations between commercial and institutional side of the artworld is more likely to happen at a local level. Another explanation is indeed the high number of intermediaries based and founded in the UK: in order to quantify the strong presence of British commercial galleries in the international primary art market we can have a look at the last Art Basel edition. In fact, out of 233 commercial galleries participating at the 2019 edition of the fair, 45 are based in London, demonstrating once again how the art market revolves around the British capital at a European and international level (Art Basel, 2019). Moreover, the 35 Berlin based commercial galleries attending Art Basel 2019 reveal us how the German capital can be included among the major hubs in the primary art market in Europe. In fact, this high representation is also reflected in Fig.1 with the 22 German commercial galleries present in our

dataset, despite there is just one German institution, Hamburger Banhof Berlin, in the sample. That means that German commercial galleries and their roster, seem to be frequently appreciated in European contemporary art world, at both fairs and institutions: intermediaries based in Berlin, such as Sprüth Magers, are then currently successful in proposing innovative and engaging programs. Regarding the relevance of the just mentioned German intermediary, in 2014 Monika Sprüth & Philomene Magers were ranked 11th on the top 100 annual review for the most influential people in the contemporary art world for their capacity to spotlight female artists (ArtReview, 2020).

In addition, since none of the institution in the sample is located in Belgium, the presence of 10 Belgian commercial galleries in the dataset can give us an idea of how the primary art market in Brussels and the Flanders is followed with interest by institutions, even out of the Belgian borders. Belgian galleries, such as Xavier Hufkens or Zeno X Gallery, are in fact progressively gaining recognition at an institutional level for the noteworthy profiles in their roster, as in the case of Luc Tuymans and Roni Horn.

Fig.1 Geographic distribution by country for the 150 European commercial galleries in the dataset.
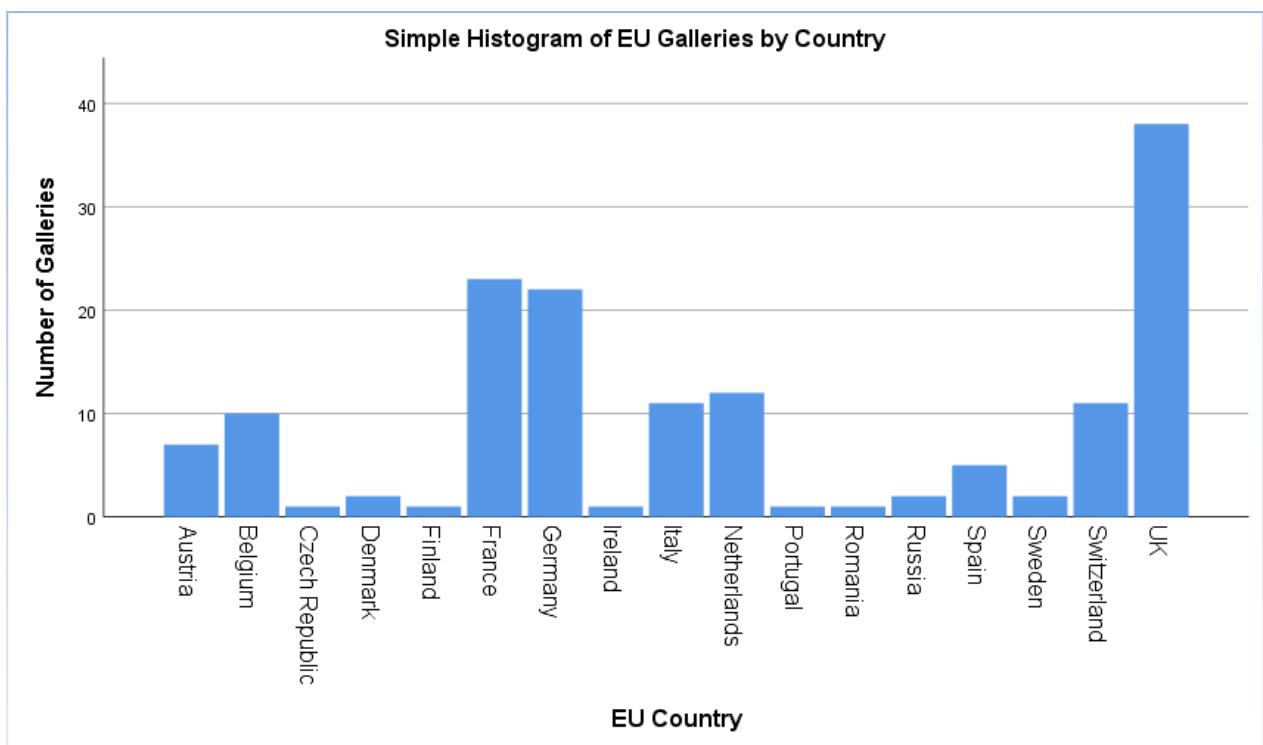
3.3 Analysis and metrics

In order to see if a small circle of "blue chip" or superstar galleries are at the core in the contemporary art network in Europe, we have to conduct a social network analysis with UCINET. Considered both Noer's (2012) and Halperin's (2015) articles, these are the commercial galleries that are usually labelled as "blue chip" or superstar ones in the contemporary American art world: Gagosian, David Zwirner, Marian Goodman, Pace Gallery, Hauser & Wirth, Matthew Marks Gallery, Paula Cooper Gallery and Gladstone Gallery. It will be then computed Degree Centrality scores to see if, in practice, these intermediaries are central within our network, so if they can be considered superstar also because of the representation that artists in their roster have at prominent contemporary art institutions in Europe.

Regarding the analysis, it is more accurate to interpret it as a structuralist paradigm rather than a proper theory or method: it represents social life in terms of structures of relationships among different agents (Carrington and Scott, 2016). From an historical point of view, the idea of a social network can be dated back to the German formal sociology where scholars, such as Simmel, tried to describe and analyze social patterns with terms such as "points" and "connections" (Carrington and Scott, 2016). A few years later, this approach was further developed by Moreno (1934) in terms of sociometry, for which a "sociogram" enabled to represent visually social systems with points and lines (Carrington and Scott, 2016). Thus, the social network analysis has its roots in the realm of sociology, being successively applied to more than 60 different fields of studies, from counterterrorism to physics, by the end of the past century (Freeman, 2004).

At the core of the social network analysis, there is the graph theory in mathematics: this application of the theory allows to represent individuals or organizations as points and their social relations as ties (Carrington and Scott, 2016). The network data are then collected in the form of a square matrix, the so-called "sociomatrix", where it is reported the presence or absence of a certain relationship (Carrington and Scott, 2016). In order to compute this analysis, we employ a social network analysis software called UCINET that allows to create network maps and calculate different centrality measures (Borgatti, Everett & Freeman, 2002). In fact, a social network analysis, besides the graphic visualization of the network, can give us multiple centrality measures of the different nodes within the system. Such measures indicators allow defining the relevance and influence of the agents involved in the network (Borgatti, Everett & Freeman, 2002).

The centralities measures considered here are the Degree Centrality and the Eigenvector ones. In addition, descriptive statistics concerning the geographic characteristics of the galleries' Degree Centrality scores will be computed with SPSS. The Degree Centrality depends on how many ties surrounds a node. Galleries with a higher Degree Centrality are the ones who had a larger number of artists exhibited at European contemporary art institutions and so the ones who are more present on the institutional side in the last decade. For our research, the Degree Centrality of the contemporary art institutions in the network is not relevant since it shows the number of solo exhibitions for living artists born after 1930 in the decade 2010-2019.

Another relevant aspect to see is whether a specific gallery seems to be closer in the network to a certain institution in order to highlight a possible liaison between two specific players in the European contemporary art system. In addition, Eigenvector Centrality is computed to measure the centrality of the nodes to which a commercial gallery is linked, namely if they represent important artists in the European contemporary art panorama. The Degree Centrality, likewise the Closeness and Betweenness ones, takes into account the topological position of nodes in the network (Gomez, 2019). Instead, the Eigenvector Centrality measures the influence of a node within the network, for which its relevance is due to the centralities of its connections, or neighbors (Gomez, 2019). Having said that, a node with a high Eigenvector score means that it is influential in a network since its connections have high centrality scores.

4. RESULTS AND DISCUSSIONS

4.1 Overview of Degree Centrality scores

In order to introduce our findings and centrality scores for the 217 commercial galleries, we can start computing descriptive statistics of Degree Centrality scores per continent and per country within Europe. The aim is to see to what extent galleries from certain continent or European country seem to present average higher Degree Centrality scores in the network. In Table 3, we can see clearly how on average galleries from the Americas, both North and Latin, present the highest average Degree Centrality scores with respectively $\mu=3.71$ and $\mu = 5.25$. If the prominence of North American, mainly from New York, galleries does not surprise us in terms of artists exhibited on average at European institutions , it is indeed curious the highest average degree score achieved by commercial galleries from the Latin America area. This high average Degree Centrality is primarily due to the outstanding Degree Centrality value scored in the network analysis by Kurimanzutto (n=14). The striking centrality score of the Mexican gallery within our network can be seen in Table 5 and will be discussed later in the present section. Moreover, Asian galleries present the lowest average degree centrality scores with approximately just one artist exhibited on average in the last decade at the 20 contempory art institutions sampled.

Table 3. Descriptive statistics of Degree Centrality distribution by continent

Continental area	μ	σ	Median	Minimum	Maximum
Asia	1.17	0.408	1	1	2
Europe	2.25	2.697	1	1	18
Latin America	5.25	5.909	3	1	14
MENA	2	1.673	1	1	5
North America	3.71	4.809	2	1	25
Oceania	2.5	2.121	2.5	1	4

The descriptive statistics in Table 4 show how British ($\mu=2.74$), Swiss ($\mu=2.64$) and French ($\mu= 2.61$) commercial galleries have on average more artists represented at contemporary art institutions in Europe. These statistics remark the primary role of Basel, London, and Paris in the European primary art market system and the relevance of commercial players based in the three

cities as authoritative gatekeepers in the international contemporary art world. In addition, it is not the case that all three cities host every year the most famous contemporary art fairs in Europe: Art Basel, Frieze London, and FIAC. These gatherings, as previously explained, are growing in numbers because they are the perfect environment for gallerists committed in expanding their network and in catching the attention of all the other stakeholders in the art world. Another interesting value in Table 4 is the mean value for Austria (μ=2.43). This is mainly due to the prominence of the Austrian art dealer Thaddeus Ropac in the European contemporary art panorama, as it is highlighted by the high Degree Centrality score achieved by his gallery in the present network analysis (n=11), that it can be seen in Table 5. Furthermore, his growing influence within the contemporary art system cannot be only circumbscribed to Europe. Theaddeus Ropac is indeed climbing the international art market hierarchy: by being considered the 84th most influential stakeholder in the contemporary art world in 2015, last year he reached the 57th position (ArtReview, 2020).

Table 4. Descriptive statistics of Degree Centrality distribution by EU country in the dataset

EU country	μ	σ	Median	Minimum	Maximum
Austria	2.43	3.780	1	1	11
Belgium	1.6	1.897	1	1	7
Czech Rep.	1	/	1	1	1
Denmark	1.5	0.707	1.5	1	2
Finland	1	/	1	1	1
France	2.61	2.061	2	1	9
Germany	2.09	2.223	1	1	10
Ireland	1	/	1	1	1
Italy	1.91	1.578	1	1	6
Netherlands	1.67	0.888	1	1	3
Portugal	2	/	2	2	2
Romania	1	/	1	1	1
Russia	1	0.000	1	1	1
Spain	1.8	1.095	1	1	3
Sweden	2	1.414	2	1	3
Switzerland	2.64	4.478	1	1	16

UK	2.74	3.644	1	1	18

The top 5 commercial galleries in terms of Degree Centrality in the network, with their respective scores within brackets, are then the following: Gagosian (n=25), Marian Goodman (n=21), White Cube (n=18), Lisson Gallery (n=16) and Hauser & Wirth (n=16). The top 10 commercial galleries for Degree Centrality are reported in Table 5. The just mentioned five commercial galleries on top of the list are the ones who had the largest number of artists that they represent exhibited at prominent contemporary art institutions in Europe. Consequently, it can be argued that they are the most influential ones, broadly speaking, and those who have interacted most with the European institutional side of the art world in the last decade. By having an overall amount of 96 artists represented in the period 2010-2019 at 20 leading contemporary art institutions in Europe, Gagosian, Marian Goodman, White Cube, Lisson Gallery and Hauser & Wirth can be considered influential in the contemporary European art system. In fact, they could be considered gatekeepers since approximately ¼ of the solo shows at prominent institutions in Europe in the decade 2010-2019 were featuring artists from their roster.

As for the top 10 commercial galleries, based on their Degree Centrality, namely the just mentioned five together with Kurimanzutto (n=14), Pace Gallery (n=12), Gladstone Gallery (n=11), Galerie Thaddeus Ropac (n=11) and Sprüth Magers (n=10), it can be claimed how curatorial decisions in contemporary European institutions are heavily influenced by these 10 international intermediaries. In fact, of the overall 396 artists that had solo exhibitions at the 20 contemporary art institutions in Europe, 154 of them are represented by these 10 galleries. In particular, as briefly aforementioned, it is necessary to comment on the high Degree Centrality value obtained by Kurimanzutto (n=14). The Mexican gallery, run by Monica Manzutto and Jose Kuri, with 14 artists exhibited at leading European contemporary art institutions in the last decade, gained undoubtedly the attention of A-class museums in Europe. The two Mexican gallerists covered in fact the 32nd position in the 2016 ranking for the most influential people in contemporary art world (ArtReview, 2020). This is because they are able to present an innovative program and to exert a relevant influence on the European contemporary institutional panorama, also at a high level. Its Degree Centrality score pops up since all the other galleries in Table 5 are from well-established markets, if not from the so-called art market capitals, London and New York. By representing local and international acclaimed artists, such as Gabriel Orozco, Damiàn Ortega, or Danh Vo, Kurimanzutto is growing outstandingly and elevating Latin American contemporary art and its market at an

international level. Other than that, its presence in Table 5 rekindles the hope for a more diversified international art market hierarchy, still heavily dominated by North American and European commercial galleries.

Table 5. Top 10 list of commercial galleries for Degree Centrality in the European network.

Commercial Galleries	Degree Centrality (n=)	Nationality
Gagosian	25	USA
Marian Goodman	21	USA
White Cube	18	UK
Lisson Gallery	16	UK
Hauser & Wirth	16	Switzerland
Kurimanzutto	14	Mexico
Pace Gallery	12	USA
Gladstone Gallery	11	USA
Galerie Thaddaeus Ropac	11	Austria
Sprüth Magers	10	Germany

Because of the large quantity of nodes and ties included in the analysis, the final network map, as reported in Fig. 2, cannot be considered informative from a graphic perspective. In fact, because of the overall size of the network, it was impossible to differentiate the two types of nodes in such a big network and detect how a small number of galleries cover a more central position within it and display a higher Degree Centrality.
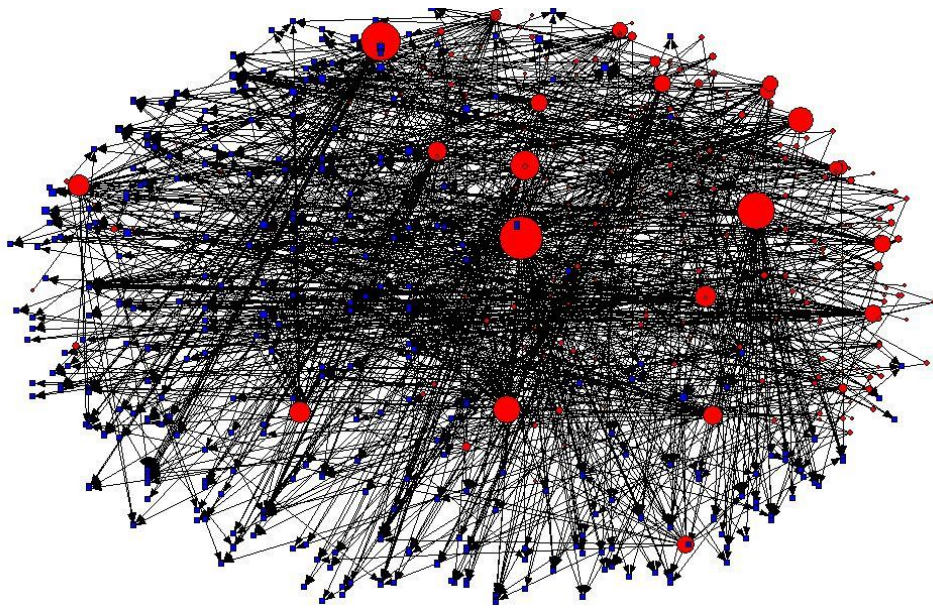
Fig.2 Final network map with nodes size set by Degree Centrality and labels omitted

However, if we consider a subsample of the first four, in alphabetical order, European contemporary art institutions: namely, Barbican, Centre Pompidou Metz, Centre Pompidou Paris and Fondation Beyeler, we can have concrete and visual idea of how the network is based on few galleries covering a central position and all the other at the periphery of the network.
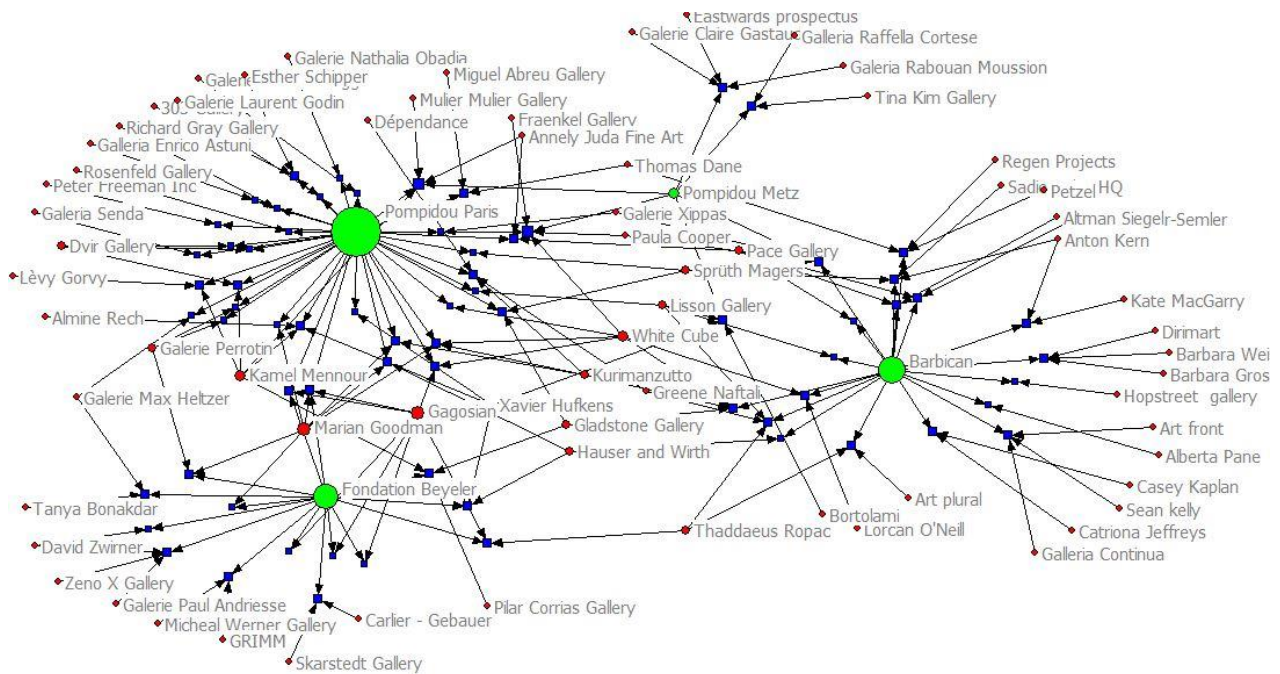
Figure 3. Network map for Barbican, Centre Pompidou Metz, Centre Pompidou Paris and Fondation Beyeler with nodes size set by Degree Centrality. Artists' labels are omitted for clarity.

In the network map in Fig.3, the green nodes represent the four European contemporary art institutions included in the subsample, whilst the red ones are the commercial galleries. The blue squares represent the contemporary artists that had exhibitions at the subsample of institutions and that are represented by the commercial galleries. In Fig.3, the node size was set by Degree Centrality. The size of the green nodes is not relevant for the present research because it relates to the number of solo shows held at the 20 contemporary art institutions in the last decade. On the contrary, the size of the red ones can tell us about which commercial galleries had a major influence on the institutional side of the European contemporary institutional side, literally which galleries had a higher number of artists in their roster exhibited at these four contemporary art institutions in Europe in the decade 2010-2019. The network map in Fig.3 strenghtens the idea of the relevant role of the Top 10 commercial galleries for Degree Centrality, as listed in Table 5, on the European contemporary institutional side. It is noteworthy in particular how the first two commercial galleries for Degree Centrality in our final network, Gagosian (n=25) and Marian Goodman (n=21), present the bigger red spots in the network map in Fig.2, showing how they have higher Degree Centrality scores also in the subsample.

4.1.1 Degree Centrality scores for superstar commercial galleries in the USA

In the present subsection we are going to see if superstar galleries in the USA, meant as the ones included in Noer's (2012) and Halperin's (2015) articles, present high Degree Centrality scores in our network. The list of superstar commercial galleries in the USA can be checked in subsection 3.3. The aim is to see whether these mostly American galleries are able to be equally influential in the European contemporary art world and if their superstardom is legitimised also by the European contemporary institutional world. The presence of commercial spaces in the European continent is also considered in the present section in order to see to what extent the proximity facilitated the bond with the institutional side. In Table 6 are reported their Degree Centrality scores, their nationalities, meant as where they were founded, and number of spaces in Europe. It seems clear how the first five galleries present in Table 6 are part also of the Top 10 list of commercial galleries for Degree Centrality in the European network, previously reported in Table 5.

Therefore we can claim that Gagosian, Marian Goodman, Hauser & Wirth, Pace Gallery and Gladstone Gallery can be indeed considered superstar galleries at an international level and that this is due to a recognition by both the European and American contemporary institutional sides.

Concerning the number of locations, we have to remark how Marian Goodman (n=21), despite only two spaces in London and Paris, has been able throughout the last decade to exert a noteworthy influence on the European institutional side. This influence is then to be attributed to the high quality profiles in her roster, as it will be explained later in subsection 4.2. Moreover, Gladstone Gallery (n=11) with its only European location in Brussels, demonstrated also to be a valid benchmark for curators in European art institutions in the period 2010-2019. Hauser & Wirth (n=16) is the only European commercial gallery that can be defined as superstar in the American contemporary art world. In fact, even if nowadays it is a multinational firm with locations all over the world, from Hong Kong to Los Angeles: it still has headquarters and spaces in Zurich, St. Moritz and Gstaad for which it has to be considered in toto a Swiss gallery. Its influence worldwide can be noticed also by the fact that Iwan and Manuela Wirth, last year, were considered the third most influential stakeholders in the Contemporary art world, according to Art Review (2020).

The German born art dealer David Zwirner (n=8) is the owner of a gallery empire: he has been unquestionably present in the top 5 of the most influential person in the contemporary art world since 2012 (ArtReview, 2020). Additionally, his gallery is listed in both Noer's (2012) and Halperin's (2015) articles. However, the gallery's Degree Centrality score invokes a stricter tie with the American contemporary institutional side rather than with the European one. Its Degree Centrality score in the present analysis can reveal that artists in David Zwirner's roster tend to be more appreciated by institutions located overseas rather than in the European continent. With regards to the American commercial galleries Paula Cooper (n=4) and Matthew Marks (n=4), listed on *Forbes*, both achieved low Degree Centrality scores. The two gallerists count zero locations in the European continent and respectively three and five spaces in the USA. Considered these values, we can claim that they are important players in the American art market so that their label as "superstar" intermediaries have to be circumscribed to the American contemporary art scene.

Table 6. Degree centrality scores for superstar commercial galleries in the USA

Superstar gallery in the USA	Degree Centrality (n=)	Nationality	Locations in Europe (n=)
Gagosian	25	USA	9
Marian Goodman	21	USA	2
Hauser & Wirth	16	Switzerland	5
Pace Gallery	12	USA	2
Gladstone Gallery	11	USA	1
David Zwirner	8	USA	2
Matthew Marks Gallery	4	USA	0
Paula Cooper Gallery	4	USA	0

By scoring the highest Degree Centrality in the present research and by being present among the small circle of five galleries that are the most influential on the American institutional side, it is no surprise that Gagosian headed the ranking on *Forbes*. This gives empirical evidence of how gallerists are interested in sponsoring exhibitions for their artists and in establishing strict relations with their institutional counterparts with the aim to increase the market value of their roster. In other words, how the representation of artists in contemporary art institutions is determinant for commercial galleries in order to boost their visibility, their roster value and consequently their revenues. Larry Gagosian by having a large number of artists exhibited at the top, both American and European, contemporary art institutions was able to transform its gallery into a multi-millionaire global cultural enterprise, counting nowadays 18 different locations in 2020 (Gagosian, 2020). Furthermore, its 9 European spaces, from Geneve to Athens, indicate to us his undeniable will to be a leading commercial intermediary in the European contemporary art panorama. An example of how Larry Gagosian recognizes the relevance of building connections with institutions, is given in next subsection, where we are going to detect a close liaison between his gallery and a world-known modern and contemporary art foundation, such as Fondation Beyeler.

4.1.2 The liaison between Fondation Beyeler and Gagosian
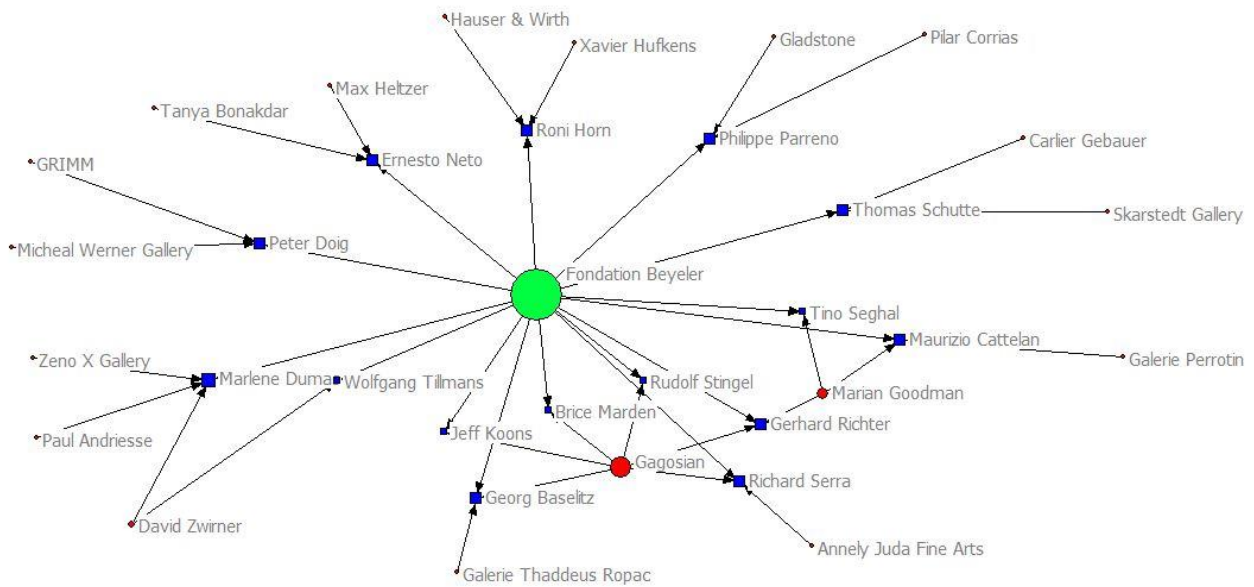
Fig.4 Network map for Fondation Beyeler with nodes size set by Degree Centrality

Fondation Beyeler was founded by Ernst and Hildy Beyeler and inaugurated in 1997 when the couple commissioned to the Italian archistar Renzo Piano the creation of a building in Riehen, Switzerland (Fondation Beyeler, 2020). The museum is now considered among the world-wide finest for modern and contemporary art due to its outstanding permanent collection, stunning architecture and high-quality programmes. However, as clearly depicted in Fig.4, it seems that their curatorial decisions seem to be aligned or heavily dependent on one Superstar commercial gallery, namely Gagosian. In the decade 2010-2019, 15 contemporary artists, born after 1930, had solo exhibitions at this European institution. The artists are the following: Gerhard Richter, Jeff Koons, Philippe Parreno, Maurizio Cattelan, Thomas Schutte, Peter Doig, Marlene Dumas, Roni Horn, Tino Seghal, Wolfgang Tillmans, Georg Baselitz, Brice Marden, Ernesto Neto and Rudolf Stingel.

In particular, artists from Gagosian's roster seem to be specially appreciated at the Swiss institution. These are: Gerhard Richter, Jeff Koons, Richard Serra, Georg Baselitz, Brice Marden and Rodolf Stingel. It has to be pointed out how, the commercial gallery itself is never mentioned among the supporters for these artists'solo shows. However, as depicted in Fig.4, the high Degree Centrality score of Gagosian within the network of Fondation Beyeler strenghtens the idea that galleries and institutions are not that separate agencies; but rather that, in the contemporary art system, they maintain quite close ties. The Fondation Beyeler's case can indeed be considered an emblematic example of this liaison since it displays the bond between a specific institution and a

specific superstar commercial gallery. If Gagosian seems not to support in a formal, and thus monetary, way shows at this institution, in any case these two stakeholders in the art world seem to have established over the years an informal connection. Another interpretation, it might be how curators at this institutions judge Gagosian as a reliable gatekeeper in the contemporary art system, meaning that there is no contact between the two players but that the gallery exert an influence on its curatorial decisions. The network map in Fig.4 then reports a curatorial programme which cannot be considered independent, in the strict meaning of the term. In fact, curators at the Swiss institution undoubtedly appear to tend to favour well-established artists represented by superstar commercial galleries, considering also the other nodes present in the network map in Fig.4.

4.2 Overview of Eigenvector Centrality scores

The Eigenvector Centrality measure can suggest to us how influential is each of the 217 commercial galleries, and so how relevant are the artists they represent, within our network. Concerning our analysis, a commercial gallery with a high Eigenvector score means that it represents artists with a high centrality score in our final network. This measure is thus not only related, like the Degree Centrality one, to the number of artists that had exhibitions at the 20 contemporary art institutions in Europe. It can be said that Eigenvector Centrality scores are then more explicative for the present research since they truly demonstrate how prestigious is a gallery roster and how much weight it has in the European contemporary art system. Top 10 list of commercial galleries for Eigenvector Centrality in the European network can be seen in Table 7.

Firstly, it has to be mentioned the outstanding high Eigenvector value scored by Marian Goodman (n= 0,087). This value indicates us that, even if Gagosian (n= 0,065) has the lead in terms of quantity of artists exhibited at European institutions in the last decade, Marian Goodman's roster seems to involve by far artists with a higher Eigenvector centrality, so with a higher impact on the European contemporary institutional side and that tend to be represented by other important commercial intermediaries. That being said, it can be claimed that a high Eigenvector score for a commercial gallery in the present research can give us an idea of the quality of its roster. Furthermore, it can be argued that this measure of centrality manifests the quality of a node in a

network, so to what extent it is influential in the network in qualitative terms rather than in quantitative, as in the case of the Degree Centrality.

It is no surprise that most of the commercial galleries in Table 7 are present also in Table 5. Most of the superstar galleries in terms of Degree Centrality have in fact high Eigenvector Centrality scores. The latter value might be given by the frequent mutual relation between superstar commercial galleries, for which they often share artists in their roster. Because of the liaison between European contemporary art institution and a restricted number of commercial players, artists shared by two notable intermediaries will have a higher Eigenvector score since is more likely that both galleries have higher Degree Centrality values, thus many other artists represented at an institutional level. In Appendix 3, we can have an idea of how Marian Goodman mainly represents artists that are in other superstar commercial galleries' rosters. Furthermore, considered the asymmetry of information in the contemporary art world, two superstar commercial intermediaries representing the same individual might also be seen as a double quality certification in terms of artistic talent, facilitating an artist's consecration and recognition at an institutional level.

In Table 7, Kamel Mennour (n= 0,022) and Galerie Max Hetzler (n= 0,018) can be considered the outsiders because of their relative low Degree Centrality scores, meaning that they were not listed in Table 5. However, both commercial galleries can be seen as influential, particularly in the European continent, because of their high-quality programs. In fact, not surprisingly, the Algerian-born French gallerist Kamel Mennour is included in the "Europe's 10 Most Respected Art Dealers" list made by *Artnet* (Neuendorf, 2016). The French art dealer started selling art door to door, whilst now his gallery counts more than 40 artists in its roster, three spaces in Paris and one in London (Neuendorf, 2016). His high Eigenvector score is then due to his ability to scout and promote high-quality profiles, such as Philippe Parreno (n= 0,136). The latter in fact has been considered last year the 45th most influential person in the contemporary art world and is represented also by the superstar gallerist Barbara Gladstone (n= 0,035) (Art Review, 2020). In addition, Parreno had, in the last decade, solo exhibitions at multiple prominent European contemporary art institutions included in the present research: namely, Garage museum of contemporary art Moscow, Fondation Beyeler, Tate Modern, and Palais de Tokyo. With regards to Galerie Max Hetzler (n= 0,018), despite just 7 of his artist had solo shows at the 20 European institutions in the sample, his Eigenvector Centrality score highlights a noteworthy roster. Concerning the present centrality measure, the German gallery seems to share artists with other

superstar intermediaries. The achievement of such an Eigenvector score is then in large part due to this. In Appendix 3, with the Eigenvector scores for Marian Goodman's roster, it can be seen how Rineke Dijkstra (n=0,057) and Thomas Struth (n= 0,094) are in fact represented just by these two intermediaries. In addition, Galerie Max Hetzler shares notable artists in the contemporary art panorama, such as Urs Fischer (n= 0,052) and Albert Oehlen (n= 0,080), with Gagosian's roster.

Table 7. Top 10 list of commercial galleries for Eigenvector Centrality in the European network.

Commercial gallery	Nationality	Degree Centrality (n=)	Eigenvector Centrality (n=)
Marian Goodman	USA	21	0,087
Gagosian	USA	25	0,065
White Cube	UK	18	0,047
Kurimanzutto	Mexico	14	0,045
Gladstone Gallery	USA	11	0,035
Lisson Gallery	UK	16	0,034
Hauser & Wirth	Switzerland	16	0,025
Kamel Mennour	France	9	0,022
Sprüth Magers	Germany	10	0,018
Galerie Max Hetzler	Germany	7	0,018

4.2.1 Marian Goodman's influence on the European contemporary art world

In Appendix 3 we can see to what extent Marian Goodman promotes and represents highly-talented profiles in the European, but also international, contemporary art world. In quantitative terms, their Eigenvector Centrality is explicative of their appreciation both on the European institutional side as well as on the commercial one, showing once again how the two stakeholders are independent but reciprocal. Artists in her roster are included in Appendix 3: the column "European institutions" means where the artist had exhibitions in the last decade, whilst the column "Other intermediaries" informs us on the other, if any, commercial intermediaries representing the

artist. All these 21 artists present quite high Eigenvector values mainly due to their consistent representation at the European institutional level. An emblematic example of this appreciation for an artist promoted by Marian Goodman is William Kentridge (n= 0,169). The South African artist is indeed one of the most famous African contemporary artists. Last year, he was included in the POWER 100, as the 51st most influential person in the contemporary art world because :" his powerfully political animation, sculpture and drawing also extend into performance and opera" (Art Review, 2020). Since Marian Goodman is the only commercial gallery representing him, his outstanding Eigenvector value is then boosted by his solo shows at European contemporary art institutions. Kentridge in fact had solo exhibitions in the last decade at Whitechapel, Tate Modern, Museo Reina Sofia, MAXXI and Garage museum of contemporary art Moscow. Moreover, to understand Marian Goodman's authority on the institutional side, and more in general, on the contemporary art world, we can mention other high-quality profiles present in her roster that can be seen in Appendix 3. Pierre Huyghe (n= 0,161), one of the most influential figures in the contemporary art scene according to Art Review (2020), is also represented by Hauser & Wirth (n= 0,025) and had major solo shows at Centre Pompidou Paris, Serpentine, Museo Reina Sofia, and Guggenheim Bilbao in the period 2010-2019. Another artist, that established a long relation with the American gallerist is Gerhard Richter (n=0,137). The German superstar contemporary artist is also represented by Gagosian (n= 0,065) and recently had exhibitions at well-known European contemporary art institutions like Tate Modern or Fondation Beyeler.

Furthermore, in Appendix 3 we can also notice, as previously mentioned, how these high Eigenvector scores are mutual among superstar commercial galleries because of their tendency to represent the same artists. In this particular case, Marian Goodman seems to share artists with another intermediary, namely Kurimanzutto (n= 0,045). From Appendix 3, we can claim that not only superstar commercial galleries tend to share the same high-profiles, but also that a sort of liaison can be detected between two specific commercial players. Out of the 21 artists in her roster included in the dataset, 6 are in fact represented also by the Mexican commercial gallery. These are: Gabriel Orozco (n= 0,107), Anri Sala (n= 0,125), Leonor Antunes (n= 0,126) , Danh Vo (n= 0,108), Nairy Baghramian (n=0,089), and Adrian Villar Rojas (n=0,073).

In Appendix 3 and Table 7, we can see clearly how influential can be a node such as the one represented by Marian Goodman in our final network. By proposing a high-quality roster she is the one, more than Gagosian, that is able to be connected to the European institutional side in qualitative terms. In other words, her high Eigenvector score, by disclosing the quality of her

program, gives us empirical evidence on how she is acknowledged as a respectable gatekeeper in the European contemporary art system.

5. LIMITATIONS AND FURTHER RESEARCH

This study aimed at giving empirical evidence of the liaison between a small circle of "blue chip", or superstar, commercial galleries involved in the primary market and contemporary art institutions in Europe. If the results seem to confirm the hypothesis, there are indeed some limitations in the present research that have to be commented on. Firstly, the sample of institutions was based on the most visited contemporary art exhibitions in 2018, as reported by Art Newspaper (2019). It could have been more accurate to have data on the most visited contemporary art exhibitions for the past decade in order to see which contemporary art institutions can be legitimately defined as prominent or A-class in the European continent. In addition, the centrality measures computed for the institutions are not informative or explicative of their relevance within the European contemporary art system. In fact, their Degree Centrality is related to the number of solo exhibitions for living artists born after 1930 that they hosted in the last decade. Having said so, higher centrality measures are not expressive of the influence or relevance of the institutions within the network. The number of solo shows then affected their centrality measures, and in the specific case of the Eigenvector centrality had an influence on artists Eigenvector scores, leading consequently to an alteration of those.

Another limitation in the present research is related to artists and their commercial galleries. In fact, the 217 intermediaries included in the dataset represent artists' current ones, as retrieved from their websites, and thus updated to 2020. However, throughout the past decade, the artists considered could have decided to interrupt a working relationship with a specific commercial gallery, in order to rely on another one. This represents a significant limitation since we did not take in consideration if, i.e in 2010, these artists were represented by the same commercial galleries as they are now.

Furthermore, the present investigation opens multiple opportunities for further research on the topic. A study can be conducted with a sample of contemporary art institutions from a different geographic area to see if also in, i.e Asia, we can detect a similar liaison. A more comprehensive network analysis can be conducted, either at a continental or national level, with regards to the sample of institutions included. Moreover, it can be highlighted to what extent the liaison is strengthened or not among various organizational structures for contemporary art institutions. For instance, to detect possible differences in the strength of this tie with the commercial side, we can consider just a specific organizational structure, such as foundations or whether they are public or

private institutions. To this regard, a comparative study on this topic can lead us to spot potential differences in cultural management as well as to what extent the organizational structure is a determinant in both the managerial and curatorial aspects of contemporary art institutions. Furthermore, a more accurate way to detect this liaison can be done by checking if the commercial gallery is present among the main sponsors for its artists exhibitions. It might be possible to map which institutions tend to rely on the commercial side to cover the production costs for their exhibitions and thus which ones are experiencing a concrete threat to their curatorial independence.

6. CONCLUSION

The present research aimed at giving empirical evidence of the liaison between 20 prominent European contemporary art institutions and a small circle of superstar commercial galleries. The network analysis is a suitable method for studies committed to understanding the artworld since it can give an idea of how this is based on different stakeholders having mutual relationships. In fact, the Degree and Eigenvector Centrality scores denoted the significant influence, in qualitative and quantitative terms, of the following nodes in the European contemporary art network: Marian Goodman, Gagosian, White Cube, Kurimanzutto, Gladstone Gallery, Lisson Gallery and Hauser Wirth. Artists represented by these notable intermediaries tend in fact to have higher representation and appreciation in the European contemporary institutional panorama.

The tie between these two stakeholders can be interpreted in multiple plausible ways. The first one regards cultural expertise. Superstar gallerists operating in the primary art market, because of their informational advantage, are seen by curators as reliable quality indicators for which they are rising as legitimate cultural gatekeepers in the current art system. Conversely, the other and most likely interpretations concern economic reasons. Art institutions are facing hard times and might opt for "blockbuster" exhibitions with well-known artists, represented by famous commercial galleries, in order to attract many visitors and media coverage. This represents clearly a threat to the cultural mission of the institution and to cultural diversity, fostering superstardom. Curatorial independence in fact represents the most precious and fundamental factor in the achievement of art institutions' purpose.

The other economic, and most alarming, interpretation for this liaison concerns the direct and formal irruption of superstar commercial galleries on the institutional sphere of the contemporary art world. As aforementioned, this practice is becoming more frequent in recent times. Superstar commercial gallerists are willing and able to sponsor exhibitions at institutions for artists in their roster in order to increase their visibility and market value. This process of contamination can lead to a vicious circle: superstar gallerists, thanks to their substantial turnovers, can afford to sponsor exhibitions for their artists at art institutions which are characterized by cost disease and scarce funds. In fact, the representation at an institutional level increases their commercial value, favoring consequently a gallery turnover, providing more financial means to reinvest and so on.

Other than that, at a more theoretical level, the independence of the institutional side with the commercial one constitutes the axis on which rotates the art world: a phenomenon of corruption between two of its constituents would have to be taken as a serious menace in terms of cultural proficiency and authority.

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APPENDIX

Appendix 1. Commercial galleries in the dataset.

Commercial gallery	Nationality	Continent	Degree	Eigenvector
Marian Goodman	USA	North America	21	0,087
Gagosian	USA	North America	25	0,065
White Cube	UK	Europe	18	0,047
Kurimanzutto	Mexico	Latin America	14	0,045
Gladstone Gallery	USA	North America	11	0,035
Lisson Gallery	UK	Europe	16	0,034
Hauser and Wirth	Switzerland	Europe	16	0,025
Kamel Mennour	France	Europe	9	0,022
Sprüth Magers	Germany	Europe	10	0,018
Galerie Max Heltzer	Germany	Europe	7	0,018
Pace Gallery	USA	North America	12	0,016
Thaddaeus Ropac	Austria	Europe	11	0,015
Galerie Perrotin	France	Europe	7	0,015
David Zwirner	USA	North America	8	0,015
Greene Naftali	USA	North America	6	0,013
Tanya Bonakdar	USA	North America	8	0,013
Carlier - Gebauer	Germany	Europe	3	0,012
Simon Lee Gallery	UK	Europe	6	0,012
Paula Cooper	USA	North America	4	0,011
Xavier Hufkens	Belgium	Europe	7	0,011
Almine Rech	France	Europe	6	0,011
Pilar Corrias Gallery	UK	Europe	5	0,011
303 Gallery	USA	North America	4	0,01
Sean Kelly	USA	North America	7	0,008
Galleria Continua	Italy	Europe	6	0,008
Galerie Sfeir-Semler	Lebanon	MENA	5	0,008
Fraenkel Gallery	USA	North America	2	0,008
Sadie Coles HQ	UK	Europe	3	0,007

Petzel	USA	North America	5	0,007
Esther Schipper	Germany	Europe	3	0,007
Skarstedt Gallery	USA	North America	2	0,007
Jack Shainman Gallery	USA	North America	4	0,007
Galerie Allen	France	Europe	3	0,007
Galerie Dohyang Lee	France	Europe	3	0,007
Sprovieri	UK	Europe	4	0,006
Frith Street Gallery	UK	Europe	3	0,006
Mendes Wood DM	Brasil	Latin America	3	0,006
Galeria Juana de Aizpuru	Spain	Europe	3	0,006
Nordenhake Gallery	Sweden	Europe	3	0,006
Michel Rein	France	Europe	3	0,006
Upstream Gallery	Netherlands	Europe	3	0,006
Kate MacGarry	UK	Europe	4	0,005
Victoria Miro	UK	Europe	3	0,005
Anna Schwartz Gallery	Australia	Oceania	4	0,005
Lehmann Maupin	USA	North America	6	0,005
Maureen Paley	UK	Europe	3	0,005
Stephen Friedman	UK	Europe	3	0,005
Galerie Jocelyn Wolff	France	Europe	3	0,005
Galerie Isabella Bortolozzi	Germany	Europe	2	0,005
Cristina Guerra	Portugal	Europe	2	0,005
Lumen Travo Gallery	Netherlands	Europe	3	0,005
Galerie Xippas	France	Europe	3	0,004
Anton Kern	USA	North America	4	0,004
Galleria Raffella Cortese	Italy	Europe	3	0,004
Annely Juda Fine Art	UK	Europe	2	0,004
Dvir Gallery	Israel	MENA	3	0,004
Galeria Senda	Spain	Europe	3	0,004
Luhring Augustine Gallery	USA	North America	2	0,004
Matthew Marks Gallery	USA	North America	4	0,004
Galerie Thomas Bernard	France	Europe	2	0,004
Galerie Lelong & Co	France	Europe	2	0,004
Lafayette Anticipations	France	Europe	2	0,004
Gavin Brown's Enterprise	USA	North America	3	0,004
Rhona Hoffman Gallery	USA	North America	2	0,004

Thomas Dane	UK	Europe	3	0,003
Galerie Nathalia Obadia	France	Europe	2	0,003
Galerie Jerome Poggi	France	Europe	2	0,003
Peter Freeman Inc	USA	North America	2	0,003
GRIMM	Netherlands	Europe	3	0,003
David Kordansky Gallery	USA	North America	3	0,003
Fortes D'Aloia & Gabriel	Brasil	Latin America	3	0,003
James Cohan Gallery	USA	North America	2	0,003
Galerie Peter Kilchmann	Switzerland	Europe	3	0,003
Mor Charpentier	France	Europe	2	0,003
Galeri Nils Staerk	Denmark	Europe	2	0,003
Galerie Templon	France	Europe	2	0,003
Galleria Franco Noero	Italy	Europe	3	0,003
Annet Gelink Gallery	Netherlands	Europe	2	0,003
Marlborough Gallery	UK	Europe	3	0,003
Workplace Gallery	UK	Europe	2	0,003
Jane Lombard Gallery	USA	North America	1	0,003
Natalia Hug Gallery	Germany	Europe	2	0,003
Ingleby Gallery	UK	Europe	2	0,003
Regen Projects	USA	North America	3	0,002
Mulier Mulier Gallery	Belgium	Europe	1	0,002
Lèvy Gorvy	USA	North America	2	0,002
Dépendance	Belgium	Europe	1	0,002
Galerie Paul Andriesse	Netherlands	Europe	1	0,002
Zeno X Gallery	Belgium	Europe	1	0,002
Grosvenor Gallery	UK	Europe	1	0,002
Yancey Richardson Gallery	USA	North America	2	0,002
Kasmin Gallery	USA	North America	3	0,002
Galerie Buchholz	Germany	Europe	2	0,002
Mai 36 Galerie	Switzerland	Europe	2	0,002
Galleria Alberto Peola	Italy	Europe	2	0,002
Taka Ishii Gallery	Japan	Asia	1	0,002
Mitchell-Innes & Nash	USA	North America	1	0,002
Richard Saltoun	UK	Europe	1	0,002
Galerie Georg Kragl	Austria	Europe	1	0,002
Andriesse - Eyck Gallery	Netherlands	Europe	1	0,002

Freijo Gallery	Spain	Europe	1	0,002
Tanya Leighton	Germany	Europe	2	0,002
gb agency	France	Europe	1	0,002
Galerie Thomas Schulte	Germany	Europe	1	0,002
Galleria La Veronica	Italy	Europe	1	0,002
Galeria Moises Perez de Albeniz	Spain	Europe	1	0,002
KOW Berlin	Germany	Europe	1	0,002
Galerie Laurence Bernard	Netherlands	Europe	1	0,002
Gavlak	USA	North America	1	0,002
Christophe Guye Galerie	Switzerland	Europe	1	0,002
Galerie Gebr. Lehmann	Germany	Europe	1	0,002
Galleria Tiziana Di Caro	Italy	Europe	1	0,002
Cinnnamon	Netherlands	Europe	1	0,002
Messen De Clercq	Belgium	Europe	1	0,002
Nicolai Wallner	Denmark	Europe	1	0,002
Johan Berggren	Sweden	Europe	1	0,002
Albarran Bourdais Gallery	Spain	Europe	1	0,002
Eduardo Basualdo Gallery	Germany	Europe	1	0,002
Long March Space	China	Europe	1	0,002
Galerie Maubert	France	Europe	1	0,002
CLEARING	USA	Europe	1	0,002
Galerie Georges-Philippe & Nathalie Vallois	France	Europe	1	0,002
SMAC Gallery	South Africa	Africa	1	0,002
Parafin	UK	Europe	1	0,002
Galerie Tschudi	Switzerland	Europe	1	0,002
Catto Gallery	UK	Europe	1	0,002
Danielle Arnaud Contemporary Art	UK	Europe	1	0,002
Steven Turner Contemporary	USA	North America	1	0,002
Matt's Gallery	UK	Europe	1	0,002
Kraupa-Tuskany Zeidler	Germany	Europe	1	0,002
The Third Line	UAE	MENA	1	0,002
Catriona Jeffreys	Canada	North America	2	0,001
Art front	Japan	Asia	1	0,001
Lorcan O'Neill	Italy	Europe	1	0,001
Art plural	Singapore	Asia	1	0,001
Altman Siegel	USA	North America	1	0,001
Bortolami	USA	North America	1	0,001
Tina Kim Gallery	USA	North	1	0,001

		America		
Miguel Abreu Gallery	USA	Europe	1	0,001
Galleria Enrico Astuni	Italy	Europe	1	0,001
Richard Gray Gallery	USA	North America	1	0,001
Galerie Laurent Godin	France	Europe	1	0,001
Rosenfeld Gallery	USA	North America	1	0,001
Micheal Werner Gallery	Germany	Europe	1	0,001
Leme Galeria	Brasil	Latin America	1	0,001
Sperone Westwater	USA	North America	1	0,001
GMG Gallery	Russia	Europe	1	0,001
Alison Jacques Gallery	UK	Europe	1	0,001
Ovcharenko	Russia	Europe	1	0,001
Edouard Malingue	Hong Kong	Asia	1	0,001
Galerie Nagel Draxler	Germany	Europe	2	0,001
Galerie Akinci	Netherlands	Europe	2	0,001
Galerie les filles du calvaire	France	Europe	2	0,001
Deweer Art Gallery	Belgium	Europe	1	0,001
Reena Spaulings Fine Art	USA	North America	1	0,001
Galerie NEU	Germany	Europe	1	0,001
Richard Taittinger	USA	North America	1	0,001
T293	Italy	Europe	1	0,001
Andrew Kreps	USA	North America	1	0,001
Catharine Clark	USA	North America	1	0,001
Casey Kaplan	USA	North America	3	0
Dirimart	Turkey	MENA	1	0
Barbara Gross	Germany	Europe	1	0
Barbara Weiss	Germany	Europe	1	0
Hopstreet gallery	Belgium	Europe	1	0
Alberta Pane	France	Europe	1	0
Galerie Claire Gastaud	France	Europe	1	0
Eastwards prospectus	Romania	Europe	1	0
Galeria Rabouan Moussion	France	Europe	1	0
Hunt Kastner	Czech Republic	Europe	1	0
ACE Gallery	USA	North America	1	0
Galerie Karsten Greve	Germany	Europe	1	0

Galerie Urs Meile	Switzerland	Europe	1	0
Ricco Maresca Gallery	USA	North America	1	0
Galerie Krinzinger	Austria	Europe	1	0
Galerie Francesca Pia	Switzerland	Europe	1	0
Carl Freedman Gallery	UK	Europe	1	0
The Modern Institute	UK	Europe	2	0
William Benington Gallery	UK	Europe	1	0
Galerie Edel Assanti	UK	Europe	1	0
Kristin Hjellegjerde Gallery	UK	Europe	1	0
Slewe Gallery	Netherlands	Europe	1	0
Kers Gallery	Netherlands	Europe	1	0
Galerie Forsblem	Finland	Europe	1	0
Francesca Minini	Italy	Europe	1	0
Galleria Poggiali	Italy	Europe	1	0
Braverman Gallery	Israel	MENA	1	0
Plutschow Gallery	Switzerland	Europe	1	0
Buchmann Gallery	Switzerland	Europe	1	0
New Craftsman Gallery	UK	Europe	1	0
Huxley-Parlour	UK	Europe	1	0
Oliver Sears Gallery	Ireland	Europe	1	0
Flowers Gallery	UK	Europe	1	0
JEALOUS Gallery	UK	Europe	1	0
The Redfern Gallery	UK	Europe	1	0
Pippy Houldsworth	UK	Europe	1	0
Marian Cramer Gallery	Netherlands	Europe	1	0
Chris Beetle Gallery	UK	Europe	2	0
Seventeen Gallery	UK	Europe	1	0
Jan Murphy Gallery	Australia	Oceania	1	0
Heillandi Gallery	Switzerland	Europe	1	0
Axel Vervoordt	Belgium	Europe	1	0
Whitestone	Japan	Asia	2	0
Setareh Gallery	Germany	Europe	1	0
Karnik Gallery	UK	Europe	1	0
Kristy Stubbs	USA	North America	1	0
Galerie Transit	Belgium	Europe	1	0
Galerie Micheal Haas	Germany	Europe	1	0
Galerie Mezzanin	Switzerland	Europe	1	0
W & K Gallery	Austria	Europe	1	0
Galerie Nikolaus Ruzicska	Austria	Europe	1	0
Galerie Thoman	Austria	Europe	1	0
David Gill Gallery	UK	Europe	1	0
Sikkema Jenkins	USA	North	1	0

		America		
Christine Konig	Austria	Europe	1	0
Galerie Tobias Naehring	Germany	Europe	1	0
Rodolphe Janssen	Belgium	Europe	1	0

Appendix 2. Dataset in Matrix form

Contemporary art institutions and commercial galleries	Artists			
	Celeste Boursier Mougenot	John Bock	Damian Ortega	Cory Arcangel
Barbican	1	1	1	1
Paula Cooper Gallery	1	0	0	0
Galerie Xippas	1	0	0	0
Anton Kern Gallery	0	1	0	0
Sprüth Magers	0	1	0	0
Sadie Coles HQ	0	1	0	0
Kurimanzutto	0	0	1	0

1 indicates if the artist had an exhibition at the institution or is represented by the commercial gallery.
0 indicates if the artist did not have an exhibition at the institution or is not represented by the commercial gallery.

Appendix 3. Eigenvector Centrality scores for artists represented by Marian Goodman included in the dataset.

Artist in MG roster	Eigenvector Centrality (n=)	European Institution	Other intermediaries
Gabriel Orozco	0,107	Tate Modern, Centre Pompidou Paris	Kurimanzutto, White Cube
Anri Sala	0,125	Centre Pompidou Paris, Serpentine, Garage Museum of Contemporary art Moscow	Kurimanzutto
Gerhard Richter	0,137	Centre Pompidou Paris, Tate Modern, Fondation Beyeler, Guggenheim Bilbao	Gagosian
Pierre Huyghe	0,161	Museo Reina Sofia, Centre Pompidou Paris, Serpentine, Guggenheim Bilbao	Hauser & Wirth
Christian Boltanski	0,055	Centre Pompidou Paris	
Maurizio Cattelan	0,086	Fondation Beyeler, Whitechapel	Galerie Perrotin
Tino Seghal	0,117	Tate Modern, Fondation Beyeler, Palais de Tokyo	
William Kentridge	0,169	Garage Museum of Contemporary art Moscow, MAXXI, Museo Reina Sofia, Tate Modern, Whitechapel	
Rineke Dijkstra	0,057	Guggenheim Bilbao	Galerie Max Heltzer

Eija Liisa Ahtila	0,052	Guggenheim Bilbao	
Thomas Struth	0,094	Whitechapel, Guggenheim Bilbao	Galerie Max Heltzer
Tacita Dean	0,097	Museo Reina Sofia, Tate Modern	Frith Street Gallery
Leonor Antunes	0,126	Museo Reina Sofia, Whitechapel	Kurimanzutto
Cristina Iglesias	0,074	Museo Reina Sofia	
Danh Vo	0,108	Museo Reina Sofia	Kurimanzutto, White Cube, Xavier Hufkens
Nairy Baghramian	0,089	Museo Reina Sofia	Kurimanzutto
Hiroshi Sugimoto	0,082	Palais de Tokyo	Fraenkel Gallery
Adriana Villar Rojas	0,073	Serpentine	Kurimanzutto
Cerith Wyn Evans	0,074	Serpentine	White Cube
Giuseppe Penone	0,087	Whitechapel	Gagosian
Giulio Paolini	0,077	Whitechapel	Lisson Gallery