How Can Economic Analysis Contribute to Our Understanding of the Arts?

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Word Count: 9308

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April 2024

I would like to gratefully acknowledge Professor Ahmed Anwar for his valuable suggestions and support during the process of researching and writing my dissertation.

I. *Introduction*

The language of discussions about the arts is often ambiguous, which encourages errors in reasoning or understanding. Let me therefore begin by offering more clarity on the terms contained in my thesis question. "Economic analysis" refers to the set of mathematical and statistical methods used to build or test economic models (Oxford Reference, n.d.). "The arts" has arrived at two conceptualizations in the cultural economics literature. One is a narrow definition that only includes paintings, sculptures, theatre, and other traditional art forms. I employ this definition throughout my dissertation. The second conceptualization is wider (and consequently vaguer) as it encompasses radio, books, film, and other art forms associated with popular entertainment. There is consensus among cultural economists who opt for the narrow definition that the submarkets for artworks and performing art services are sufficiently distinct to deserve separate analysis. I therefore restrict my attention to the submarket for artworks. For simplicity, I assume that an artwork does not have practical or ergonomic utility (as with fine china, luxury cars etc.), but embodies the phrase *art for art's sake*. Lastly, throughout this survey 'art market' and 'arts and culture industry' are used interchangeably.

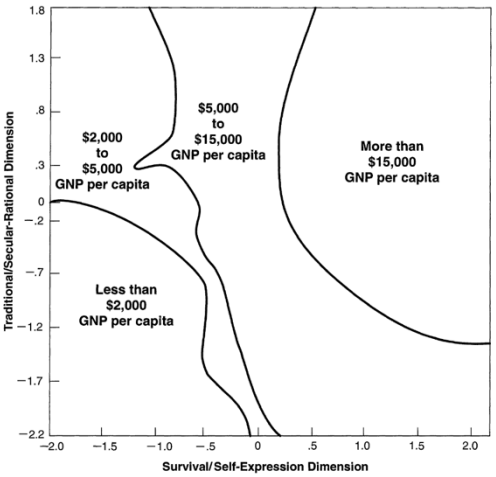


Figure 2. Economic Zones for 65 Societies Superimposed on Two Dimensions of Cross-Cultural Variation

Note: All but one of the 65 societies shown in Figure 1 fit into the economic zones indicated here; only the Dominican Republic is mislocated.

Source: GNP per capita is based on the World Bank's Purchasing Power Parity estimates as of 1995, in U.S. dollars (World Bank 1997:214–15).

There is an underlying assumption in my title. Before looking at *how* economics can contribute to our understanding of the arts; I must first consider whether economics can yield insight about the arts *at all.* There are two topics that undoubtedly demonstrate the connection between economics and the arts: welfare and income. To understand how economic welfare relates to arts and culture, note that 'culture' can be defined as 'the general state of material, spiritual and intellectual development of a society' (Goodwin, Art and Culture in the History of Economic Thought, 2006). The 'material' feature of this definition of culture is consistent with the empirical work of Ronald Inglehart, a political scientist and founding director of the *World Values Survey* (WVS). The WVS is a research project conducted every 5 years that spans 120 nations. Participants respond to a scheme of questions designed so that researchers can quantitatively measure where their values lie along "traditional vs. secular-rational" and "survival vs. self-expression" axes. These estimates are then regressed against various characteristics, including GDP Per Capita, to uncover patterns such as those depicted in the authors' "Figure 2". The WVS repeatedly observes that as economies develop over time, the preferences of citizens tend to shift in a postmaterialist direction (Inglehart & Baker, 2000). This discovery suggests that policymakers of high-income nations should not only care about the

abundance of material resources. If social planners wish to maximise the preferences of their citizens, they should aim for 'postmaterial' abundance by ensuring that cultural heritage is preserved and that economic conditions are favourable for new artistic creation to take place.

What is the connection between income and the arts? From the eighteenth-century writings of David Hume to the twentieth-century debates by the Bloomsbury Group, artistic culture has long been suspected of effects that spill over into wider society (Goodwin, Art and Culture in the History of Economic Thought, 2006). Indeed, contemporary policymakers believe that a community's ease of access to the arts can help to alleviate economic poverty (Andrews, 2014), perhaps by facilitating social connections or knowledge spillovers that lead to income growth. However, one notes that externalities are difficult to measure, and this speculated causal channel probably involves reverse causation and a multitude of confounders. Instead, cultural economists tend to focus on the size of local income attributable to the arts and culture industry. In practice this involves a Leontief input-output model which, as outlined in James Heilbrun and Charles Gray's book *The Economics of Arts and Culture*, calculates "the value of purchases by each industry from every other industry that are required to produce one year's total output in the economy being studied" (Heilbrun & Gray, 2001). In this fashion, the art market's direct impact and multiplier effects (i.e. the indirect impact on the supply chains of these purchases and the induced impact of further rounds economic activity) can be estimated. Using this methodology, the CEBR reports that in 2016 the UK arts and culture industry generated £10.8 billion directly and £12.2 billion indirectly in Gross Value Added (GVA) – that is, 1.3% of the national total (Centre for Economics and Business Research, 2019). For comparison, GVA by the arts and culture sector was roughly two-thirds of the economic impact of the sports industry (Allen, 2016). We may never comprehend the true extent of spillovers from arts and culture into society, but we can conclude that these activities have a significant impact on local and national income.

For the past two centuries the connection between economics and the arts was ignored. Most economists opted not to bring their economic perspective to their artistic interests - stark examples include the scholarly essays of Adam Smith on music and John Ruskin on art criticism (Throsby, The Production and Consumption of the Arts: A View of Cultural Economics, 1994), which are devoid of the economic analysis ubiquitous throughout their other works. The injunction to spare the arts from economic methodology can be traced back to two sources, both originating in the nineteenth century. The first is romanticism, a historical period in which public intellectuals like Percy Shelley held that "the poetry is concealed by the accumulation of facts and calculating processes" (Shelley, 1840). The prevailing notion was that the arts is and should stay a domain of unknowable creative inspiration, liberated from the constraints imposed by scientific thinking. While creative inspiration remains mysterious, it is not unknowable for we have progressed in our understanding of it (Section III features an attempt to capture artistic production mathematically). Moreover, the romantic perception of the arts as an imaginative realm does not change the fact that the arts are constituted by *individuals* and *organisations*, who are impacted by factors in their environment, be that political stability, religious censorship, social customs, or the state of the economy (Bryant & Throsby, 2006). Hence, it is not the case that studying art and culture through a social scientific lens "conceals" their beauty; rather, it can reveal a *deeper* beauty that lies in their complicated interactions with human society.

The second nineteenth-century reason for the conventional separation between economics and the arts is more serious. This influence did not arrive from outside economics, as with romanticism, but grew from within. Jeremy Bentham was a forceful proponent that artistic goods and services should not be

treated differently to other forms of entertainment (Bentham, 1789). The economic historian Crauford Goodwin interprets this as part of his desire to "postulate simple and universal principles of human behaviour, rooted in utility calculations, that could be used to model the economy". His lesser-known legacy was that the next generation of marginalists and political economists failed to recognise the distinction between higher artistic experiences and baser forms of consumption (Goodwin, Art and Culture in the History of Economic Thought, 2006). Fortunately, contemporary economists know that the social world is immeasurably complex and are very aware that some assumptions are too reductive to justify their analytical convenience. What are the properties of artistic goods and services that necessitate them being treated differently to other forms of entertainment? First, their marginal utility of consumption is thought to be increasing as one accumulates taste, knowledge, and experience (Marshall, 1890). Second, their utility can be partitioned into whether one derives aesthetic value or financial services via their potential for price appreciation (Mandel, 2009). Third, they can be *a priori* characterized as heterogeneous, produced by individuals rather than firms, and perfectly inelastic in supply if their producers are retired or dead.

This chasm prevented the arts from learning about the underlying mechanisms of its market and economics from widening its focus to include what Robert F. Kennedy described as "that which makes life worthwhile" (Kennedy, 1968). Attitudes began to change in the latter half of the twentieth century with the publication of such pioneering works as John K. Galbraith's 1960 book 'The Liberal Hour' in which he inspects the economic situation of the artist (Galbraith, 1960), Lionel Robbins' 1963 article 'Art and the State' examining fiscal policy and the arts (Robbins, 1963), and especially William Baumol and William Bowen's article subjecting the performing arts to theoretical and empirical scrutiny (Baumol & Bowen, On the Performing Arts: The Anatomy of their Economic Problems, 1965). Throughout the 1970s a literature emerged and expanded, became known as 'Cultural Economics', and formed an association, a journal, and an international conference which stay vigorous to this day. By gathering more recent insights from the economics of art and culture, I hope to chart the progress of the field since its inception. Have the results of its early literature remained unchallenged? In its present state, how can the field contribute to explaining the art market? What are the key questions it has yet to answer? This thesis is not intended to be an exhaustive survey; instead, I assign pages to the topics that I deem to be the most noteworthy, so that I may discuss them in adequate detail. Inevitably this results in some topics being emphasized more than others (those of Section IV, for example). With the above objectives in mind, the remainder of this paper is organized as follows: Section II examines Market Structure and Valuation in the arts; Section III investigates the Supply of Art; and Section IV analyses Art Demand.

Section II. *Market Structure and Valuation*

In David Throsby's landmark survey, published in 1994, he describes a schema that represents the structure of the arts as being segmented into three levels (Throsby, The Production and Consumption of the Arts: A View of Cultural Economics, 1994). The lower end of the art market is the 'tertiary level', a decentralized population of independent artists who produce artworks for local galleries, art fairs, and small-scale private buyers. The tertiary level resembles perfect competition: there is an enormous number of artists, each possessing a tiny market share and no price-setting power, for there are no reputational advantages or credential requirements to barrier entry. Perhaps this is the most efficient segment of the art market since consumers purchase artworks at cost price and unproductive artists are swiftly ushered into alternative careers. A critique is that tertiary-level artists may lack an incentive to innovate their practices given the ease of imitation by new entrants. The middle of the art market is the 'secondary level' and is centralized in major cities (like London, New York, or Paris), where professional artists and collectors circulate artworks. Urban economists attribute the existence of industry-specific clusters to agglomeration economies. For example, if an art school and a gallery randomly relocate to the same Parisian *arrondissement*, this incentivizes artists (who seek lower transport costs, more exposure to commission opportunities, more skill-sharing) and collectors (who wish to view more talent) to also relocate to that neighborhood, reinforcing the initial effect. Throsby draws attention to Dean K. Simonton's data, which contains observations for 900 years and 772 visual artists and sculptors (Simonton, 1997). Simonton finds a positive relation between creative achievement and social contacts (associates, rivals, or mentors). The fact that remote communication technology did not exist over most of the last millennium hints that these productivity benefits arose within cities. While clustering may enhance a neighborhood's amenities and productivity, urban economists expect that, *ceteris paribus*, rent and congestion will subsequently rise in cost until spatial equilibrium is restored.

In the improbable event that a living artist transitions from the tertiary to secondary level, this is due to recognition by a reputable art dealer, gallery, or art fair. Artworks created by still-recognizable dead artists also exist on the secondary level of the art market. There are limited buyers who are affluent and 'in-the-know' collectors and galleries. It is not uncommon for these collectors and galleries to tie up the artworks of a particular artist so that they can behave as a monopsonist towards the artist and a monopolist with other buyers. This high concentration of market power is entrenched by increasing returns-to-scale. Namely, the collectors and galleries who draw in more visitors can attract artists from rival agreements. The main determinant of the prices earned by artists for their works is reputation, and reputation relies on institutional backing (elaborated in Sections III and IV). The uppermost end of the art market is the 'primary level', which stretches internationally. A handful of dealers and auction houses act as intermediaries in the trade of the most famous artists' works, which sell for astonishing prices. The Art Basel and UBS Global Art Market Report shows that in 2018, 45% of the total sales value of dealers with turnover above $1 million were accounted for by a single artist and 61% of the total sales value of fine art auction houses came from 1% of their lots (McAndrew, 2019). These figures highlight the extreme earnings gradient in the upper reaches of the artist career pyramid (see Section III for more). Taking the schema forward, much of the economic analysis in this thesis is targeted at the primary and secondary levels of the art market and may not extrapolate to the tertiary.

Auction houses charge fees for the valuation of artworks, which is an exceedingly difficult task. The combination of material and labour to produce, say, Leonardo Da Vinci's 'Salvador Mundi' or Jeff Koons' 'Rabbit', scarcely accounts for their sale prices in auction, which fetched $450 million and

$90 million respectively. Moreover, demand in the primary and secondary submarkets is highly volatile because it is composed of a small number of collectors and galleries. Therefore, an action taken by any one entity can have enormous effects. These valuation difficulties have led past economists to caution would-be investors, advising them to purchase only the top works of established artists (Mei & Moses, 2002). However, more recent evidence suggests that masterpieces might *underperform* the rest of the art market (Pesando, 1993) (Goetzmann W. N., Accounting for Taste: Art and the Financial Markets Over Three Centuries, 1993). The art market is itself subject to a high degree of randomness, though it does exhibit a small positive time trend (Baumol, Unnatural Value: Or Art Investment as Floating Crap Game, 1986). Valuation concerns itself with predicting prices, not explaining them; therefore, I leave my analysis of the fundamental drivers of art prices to Section IV.

Auction theory teaches how auctioneers can maximize selling price and ensure that the article is won by the bidder with the highest reservation price. While laudable, the contributions of auction theory are well documented in earlier literature surveys. In this section on valuation, I question whether the low performance and under provision of appraisals is a market inefficiency limiting the exchange of artworks. Professional art appraisers are employed by auction houses to formulate upper and lower bound price estimates for each artwork going to auction. A price estimate represents the range of 'hammer prices' for which these experts believe an artwork could reasonably sell. One report covering 195,479 of Sotheby's and Christie's (two major auction houses) lots between 2016 and 2017, finds that artworks sold for a price within art appraisers' predicted range in just 37% and 41% of the sales, respectively (Bjerg, 2018). Appraisals are slow, in addition to being inaccurate, because they are constrained by the number of employees. Human experts are also only productive during the working hours of the day, unlike machines that do not have leisure or sleep needs. Therefore, it has become infeasible for owners of artworks not on the auction market to know the value of their assets (Bailey, 2020). The art market is already considered illiquid due to intermediaries who charge transaction fees and fluctuations in the presence of buyers, and economists would predict a lack of transparency to exacerbate the problem (Amihud, Mendelson, & Pederson, 2006).

An innovative solution is to complement human appraisers with machine learning models. While only humans can factor in insider-industry knowledge (e.g. the affiliations between collectors), machines can produce less biased and more consistent appraisals with regard to the visual features of artworks (Ayub, Kräussl, Gustavo, & Spaenjers, 2019). When machines search for signs of an artist's reputation in textual data (i.e. word counts referring to their artworks and biographical information), they perform far better than visual data alone - once again affirming the high worth placed by the market on reputability. That longstanding results of cultural economics are reproduced by frontier economic methods - like neural networks and k-fold cross validation - the strengthens their validity. Machine learning models predict more accurately than hedonic regression models when both are fed the same data, presumably because the former automatically captures any important and complex interactions *between* features which may be missed by the latter, whose vector of features is specified manually (Bailey, 2020). An interaction would model if there were price differentials related to particular combinations of artist, size, and colour. It therefore appears that the performance of human appraisers would be enhanced if their price estimates were cross-examined against those yielded by machine learning. While machine learning is less accurate, it conducts appraisals faster and can handle an unlimited volume of artworks. This presents an opportunity to conduct valuations for all artworks, on and off the market, as is standard in other industries such as real estate. Transparent information may thaw some of the market's illiquidity, because those who were averse to the risks of inaccurate price

estimates and those who simply could not obtain a valuation of their assets become more willing and able to trade.

Contrary to the fierce resistance one would expect from an agent who benefitted from an informational advantage in a market's *status quo*, Sotheby's is implementing machine learning to automate not only price-estimation but "the entire end-to-end sales process" for the secondary and tertiary segments of the market (Bailey, 2020). The strategy was announced in an internal communication, reported on by Jason Bailey in the Harvard Data Science Review. Sotheby's hopes to free the attention of appraisers from auction lots whose stakes of inaccuracy are low, so that they can place greater focus on the low volume of crucial and highly priced lots. Another of the auction house's machine learning initiatives is to generate up-to-date price estimates for all artworks ever sold, with the intention of increasing the likelihood that present occupiers resell through the auction house. If these owners of artworks choose to re-engage with the market, Sotheby's can leverage recommender algorithms that have tracked buyers past behavior, and maximize the number of interested buyers present when the bidding commences. Andrew Shum, the VP Director of Product at the institution, states that "the number of bidders was second only to the artist who created the work" in driving up sale prices. Widespread usage of automated appraisals and recommender engines may eventually have welfare consequences for the arts, and could be an important topic in the future of cultural economics research.

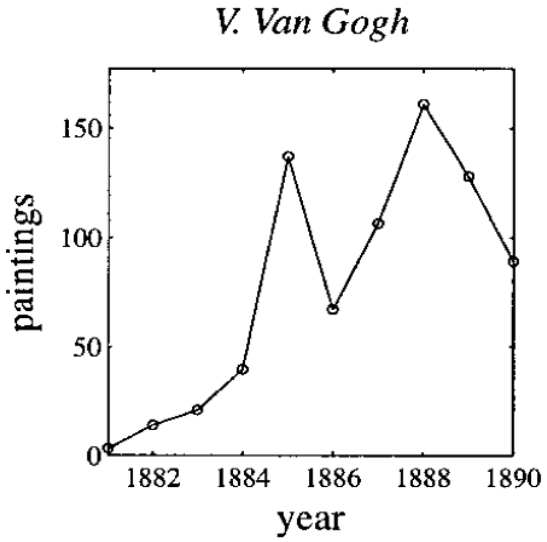
Section III. *Supply*

While cultural economists think that demand is the principal driver of events in the arts, it is worthwhile to describe what is known about supply. This section is punctuated by instances in which theory is not consistent with empirical findings, revealing that there is considerable ground to be made before we truly understand this aspect of the arts. As mentioned in Section I, the nature of artistic production is *sui generis*. Its properties (heterogeneity, production by individuals rather than firms, and perfectly inelastic supply when producers are retired or dead) imply that the artistic production is less variable than demand. For this reason, economic models often presuppose a fixed supply of art (see Section IV). Artworks are seemingly infinite in their diversity and defy commodification (Caves, 2000). Nevertheless, Ekelund, Ressler, and Watson uncover evidence that artworks can indeed have close substitutes. They study how the prices of an artist's existing works tend to rise immediately after their death and interpret the occurrence as a constriction of the supply of close substitutes: possible future works produced by the same artist (Ekelund, Ressler, & Watson, 2000). This favours Oscar Wilde's conception of art as "the unique result of a unique temperament" (Wilde, 1900) - artworks are heterogeneous between artists but homogenous for the same. This line of thinking requires further study. Art is widely thought by economists to be excess in supply. The first potential cause is that the number of programmes provided by art schools overshoots the number of career prospects that graduates will be exposed to (Benhamou, 2011). The second potential cause of excess supply is the desire of critics and the public to be surprised, which encourages artists to produce works that are in any way original relative to the existing offering (Menger, 2006).

Mandel notes that studies disagree on where to draw the boundary around the activities that define a professional artist: "reasonable people can disagree on exactly 'what is art?', which makes its supply essentially arbitrary" (Mandel, 2009). One solution to the presents itself in an online survey conducted by the Arts Council England in 2016, which asked over two thousand visual artists to describe, in their own words, the primary and other artforms that they practice. Once the responses were "cleaned and standardised", there were 115 distinct artforms that could be gathered into 14 artform groupings, which, for robustness, each contained a minimum of fifty responses (TBR, 2018). This represents a method by which researchers can arrive at a functional definition of genres within the arts. In a separate survey of US censuses throughout the twentieth century, the number of artists in America was found to have risen from 386,000 in 1940 to 1,931,000 in 2000 (Alper & Wassal, 2006). That is an increase in the proportion of the workforce from 0.7% to 1.4%, however, the critique has been made that the proliferation of short-term employment contracts inflates observed figures. If the artist labour market truly is growing, the choice cost faced by consumers becomes more significant, making the copying of neighbours' consumption choices a more attractive option (Adler, 1985). Small differences along the distribution of artistic talent would then translate to enormous differences in fame and wages (Rosen, The Economics of Superstars, 1981). This would be a neat explanation for the dual nature of the artist labour market, anecdotally considered to be divided into 'superstars' and 'starving artists'. While there is wide earnings inequality, empirical findings debunk the myth of the starving artist. Artists do suffer a wage penalty for their choice of profession, but the average artist is not drastically poorer than the average worker (Alper & Wassal, 2006). Some claim that artists' incomes are supported by transfers from social security or the public support (Menger, 2006), which also allow the interpretation of creators smoothing their consumption over the long time interval before their artworks become appreciated.

In his 1891 essay *The Soul of Man*, Oscar Wilde argues that if an artist "takes notice of what other people want" and "tries to supply the demand", he ceases to be an artist. In a capitalist society

founded on private property, individualism can only be fully realized when a person has sufficiently abundant wealth to not have to devote time and effort to the interests of others. While there are historical examples of artists who, liberated from economic concerns, "[never] did a single day's work for hire" and carried their creative potential into fruition (Wilde, 1900), these artists are the anomalies. Wilde's artist and economics' *homo economicus* are two antithetical abstractions; the living and breathing employee of the arts sector is somewhere in between. In the real economy, material needs impose themselves upon artists, and while the artist wishes to devote her full time to creative self-expression, this is simply not possible under conditions of scarcity. It is therefore not uncommon for artists to work multiple jobs, inside and outside the arts (Menger, 2006). If working multiple occupations is a necessity, how should artists allocate their labour? One may construct a labour supply model where an artist chooses between artistic work (i.e. her 'calling') and non-artistic work which earns her income to buy consumption goods and services needed to survive. When the relative wage



for non-artistic work increases, the artist can substitute more time towards artistic projects whilst keeping the same standard of living (Throsby, Cultural Economics and Cultural Policies, 1994a). However, this prediction is contradicted by data that artists work *fewer* hours per year than other professions on average (Alper & Wassal, 2006).

Scholars have mathematically modelled why some artistic creators are prolific throughout their lifespan while others oscillate between periods of activity and inactivity. Rinaldi, Cordone, and Casagrandi define two state variables – satisfaction, a discounted integral of past achievement, and creativity, the fluency of conceiving new ideas and actualizing them – as determinants of creative production, inter alia, and relate them with two differential functions. The flow of achievements is a monotone function of creativity, satisfaction increases with the flow of achievements, and creativity is stimulated by the rise and fall of satisfaction. The authors admit the strong assumptions of their closed system: psychological, learning/adaptation, and aging parameters are held constant. Regardless, they persuasively conjecture that artists whose productivity fluctuates (the quintessence of whom is displayed above) are sensitive to changes in satisfaction and do not forget the past quickly (Rinaldi, Cordone, & Casagrandi, 2000). Turning now to extrinsic motives, the microscopic chance of an artist reaching the primary market, and earning herself a fortune, resembles a lottery. The US National Longitudinal Survey of Youth 1979 follows thousands of people's careers over twenty years and illustrates that while many people participate in the artistic labour market, only 2% succeed to an extent that enables them to sustain a career in the arts for 10 or more years (Alper & Wassal, 2006).

The average time people worked in the arts was 2.2 years The high turnover of workers in the industry therefore represents (often young and risk-taking) individuals entering and leaving the lottery after having learned that they overestimated their likelihood of success (Rosen, Prizes and Incentives in Elimination Tournaments, 1986). Employment in the arts is usually short-term and contingent because of the specialized skills demanded by different projects and the temporary character of artistic production – for example, a specific piece commissioned by a council or gallery (Benhamou, 2011). Work cycles can be thought to accelerate the growth of artists' reputations and allow them to diversify risk across a portfolio of recurrent and non-recurrent employment ties (Menger, 2006). This does mean, however, that job search costs cannot be rationalized by compensation from long-term employment, as is convention in labour market economics. Pierre-Michel Menger, chair of the Sociology of Creative Work at the Collège de France, astutely notices that arts (1) firms tend to be vertically disintegrated, to avoid exposing themselves to the risk of investing in any single artist, who may be celebrated in one instant and ridiculed in the next; and (2) while teams can foster positive peer effects from idea-sharing or rivalry, they may magnify the art market's talent inequality if their selection is homophilious. Arts firms may also suffer from Baumol's cost disease: productivity gains are harder to achieve with labour-intensive forms of production, hence as wage growth spills over from the wider economy, the costs faced by arts firms outstrip productivity growth (Maiello, 2017).

Is it ability or reputation that governs an artist's probability of moving up a level of the art market in her career? Cases in which misattributed works plummet in price from millions to almost worthless despite their physical characteristics staying unchanged strongly suggest that reputation is the more important factor. Further, education is not as significant a determinant of income compared to other occupations (Filer, 1990), because reputation bestowed by critics and reviews from past projects are the filtering devices preferred by employers. There are therefore lower theoretical incentives for an artist to invest in human capital and indeed empirical results exist that show artists on average receive slightly fewer years of schooling relative to the remaining population of professionals. How does one build reputation? There is evidence to indicate that it is not ability that fosters an artist's reputation. Instead, reputation is built from an artist's appearance in top galleries early in her career (Fraiburger, Sinatra, Resch, Riedl, & Barabási, 2018).

Section IV. *Demand*

Thus far I have depicted the relation between the arts and the national economy in broad strokes. Yet to understand demand for the arts, which is the summation of demand by individual consumers, I now pivot to a more granular level of analysis. Individuals purchase goods and services to obtain utility. Specifically with art objects, one can distinguish between utility from its private or common aesthetic value. Private aesthetic value is the part of an individual's willingness to pay for an art object deriving from how its consumption may deliver direct intrinsic aesthetic pleasure; this willingness to pay is *independent* of valuations of the art object by other individuals. To describe private aesthetic value, cultural economists tend to opt for a hedonic utility function which takes an artwork's features as inputs – size, color, symbolic or historical significance, for example criticism (Throsby, The Production and Consumption of the Arts: A View of Cultural Economics, 1994). However, as alluded to in Section II, hedonic utility functions must be arbitrarily defined (Mei & Moses, 2002). The problem lies in how the features of art objects that contribute to their perceived beauty are often intangible, highly subjective, and tricky to disentangle from one another.

The barriers to explaining why private aesthetic value differs between art objects has not discouraged attempts to quantify individual utility. To this end, economists have discerned between stated preferences – studied in discrete choice experiments, i.e. participants are asked how much they would be willing to pay for one hypothetical option or another - and revealed preferences, studied in quasi-natural experiments where behavioral changes caused by some exogenous variation convey a willingness to pay. Revealed preferences has been economists' preferred method for it disallows the Hawthorne effect: when participants modify an aspect of their behavior because of their awareness of being observed (Spencer & Mahtani, 2017) – for instance answering discrete choice questions strategically. However, research from the last two decades demonstrates that both methods balance on the precarious assumption that individuals are rational and perfectly predict which decisions will maximize their utility. In (Krekel & MacKerron, 2023), a discussion paper published last year by the LSE Centre for Economic Performance, the authors assert that while this assumption carries analytical convenience, it may not overcome three recent findings: that cognitive biases are pervasive, displayed by the significance of whether prospects are framed as gains or losses; that individuals' assessment of their welfare is subjective and context-dependent; and that there are systematic prediction errors about the utility that may come about from varying decisions.

It is worthwhile allocating our attention to understanding Krekel and MacKerron's contribution to quantifying utility. In their discussion paper the authors introduce a new method made possible by technological advances that have resulted in the ubiquitous ownership of mobile phones. This method is *Experiential Valuation* and involves "a smartphone app that over the eight years randomly asked a panel of 30, 936 UK residents (N = 2, 235, 733) about their momentary feelings and activities". The authors set out to estimate how individuals value time in the context of commuting (an objective in transport economics is to quantify the benefit of time savings that might accrue from infrastructure investments), but as part of their research they estimate the 'Value of Time' (VOT) for 40 other activities, including engagement with the arts. While not exactly being the "hedonimeter" envisioned by Francis Y. Edgeworth, which would directly observe utility at the physiological level (Edgeworth, 1881), Krekel and MacKerron's method is justified on the basis that individuals' experiences matter *to them* and these experiences also have implications for their behaviour. The authors quote Edgeworth himself in that "greater accuracy may be attained by more numerous observations with a less perfect instrument", and indeed this method has the capacity to reach an enormous sample of individuals compared to stated and revealed preference experiments. Another justification is that unlike stated and

revealed preference studies, experiential valuation recognizes the gap between *decision utility* and e*xperienced utility*: individuals are not required to "predict the welfare consequences of different options at the point of decision-making"; instead, their hedonic experiences are measured after they have made the decision. This is a distinction first put forward by Daniel Kahneman who has been influential in the development of other kinds of 'self-reported life satisfaction' that seek to value intangibles – such as the Day Reconstruction Method (DRM) (Kahneman & Sugden, 161–181), currently used by the UK Treasury, in which individuals "systematically reconstruct their activities and experiences of the previous day with procedures designed to reduce recall bias". Krekel and MacKerron's Experiential Valuation yields similar results to Kahneman's DRM, providing evidence for its' validity. Indeed, one could argue that it surpasses the DRM, because measurements are taken in real-time which is advantageous if we wish to assess *moment-to-moment utility* as opposed to something akin to *general life satisfaction*.

When the smartphone app messages an individual at a random point in time, it asks four questions: how happy they feel in that moment; where they presently are; who they are with; and what they are doing. The earlier critique of subjective welfare no longer stands in a setup that observes within-individual variation, where individuals judge by their own consciousness what activity they perceive themselves to be doing and how they perceive their happiness. The critique of context-dependency is addressed by estimating the binary-variable interactions for location, who else is present, and secondary activities. (An example observation for an individual might look like: 85 out of 100 on the happiness scale, drinking a coffee and visiting a gallery exhibition, with a relative, in the New Town of Edinburgh.) Having collected this data, the authors regress income and each of the forty-two activities on momentary feelings of happiness, controlling for meteorological conditions along with region and time fixed effects (though they are of little consequence for the results). Next, the authors calculate the Marginal Rate of Substitution between income and each activity to obtain an "income equivalent", which can be thought of as the amount of income for which an individual is indifferent between solely receiving the payment versus spending 60 minutes engaging in the activity. Note that the *wage* is thought to be higher than the income equivalent for leisure because the individual must be compensated for some disutility bestowed by the work. Finally, for each activity $\{k\}$and using a weighted average of the income equivalent of all other activities $\{k'\}$ (the opportunity cost), they calculate:

$$VOT_k = Income\ equivalent_k - \overline{Income\ equivalent_{k'}}$$

We may interpret this as the utility, in monetary terms, of an individual spending 60 minutes doing activity {k} as opposed to doing something else. Their primary result of interest is that the estimated VOT savings from a 60-minute reduction in waiting during commuting is £17.2, similar but not identical to the estimates of revealed preference studies. However, pertinent to the topic of this dissertation, Krekel and MacKerron's results also show that artistic consumption (theatres and exhibitions) and artistic production (arts and crafts) are among the activities that generate the highest utility – below only sports and intimacy. Cultural economists should note the potential for generalizing Experiential Valuation to measure the relative utility that individuals derive from differing art objects. Are there experimental designs that could separate the private from the common considerations that go into aesthetic valuation? By measuring private aesthetic value derived from bundles of art objects of similar characteristics, could we disentangle the characteristics that, on average, explain perceived beauty? These are stimulating questions, but ultimately we can expect the arts to hold onto something that cannot be grasped or explained, however small that may be.

Common aesthetic value, on the other hand, is the part of an individual's willingness to pay for an art object deriving from how its consumption may signal cultivated taste or wealth to social contacts; this willingness to pay is *dependent* on the valuations of the art object by other individuals. The thread of this idea can be traced back to 1899, when Thorstein Veblen, in his seminal treatise on the "leisure class", described a class of goods that feature high demand despite being more expensive than their functional equivalents. Such goods, he argued, enable a consumer to maintain a "high standard of expensiveness and wastefulness" (Veblen, 1899), prompting certain later economists to conclude that price enhances utility, However, Veblen would disagree with the notion that an individual achieves greater happiness by being 'ripped off'; instead, he would likely claim that a high price allows the individual to advertise and provide evidence of their cultivated taste or wealth, to their social contacts, so that they may acquire status or esteem, which delivers utility. Thus, this consumption relies on being conspicuous. Alternatively, the individual could acquire esteem from the size of their collection of conspicuous goods, rather than their steep price. The literatures of psychology, anthropology, and sociology had long theorised and empirically proven that there exist *purely* social and cultural factors within individual preferences before microeconomics eventually responded at the end of the twentieth century.

One of these responses is Bagwell and Bernheim's 1996 paper, in which the authors formalise Veblen's theory in a signalling model. They investigate two factors that drive demand for artworks - private aesthetic value and common aesthetic value - without abandoning the traditional economic tenets of consistent and self-interested optimization (Bagwell & Bernheim, 1996). The authors conceptualize Veblen's 'conspicuous consumption' as being subject to incentive compatibility conditions. In their words, "members of higher classes voluntarily incur costs to differentiate themselves from members of lower classes […] knowing that these costs must be large enough to discourage imitation" – one may consider these as requisite criteria for any separating equilibria to emerge in a signalling model. (Note that from here on, I adjust Bagwell and Bernheim's framework such that it may apply specifically to artworks.) Consumption of artworks may bestow utility unto an agent in two ways: intrinsic aesthetic pleasure and social status. Specifically, imagine an agent visiting an auction and choosing whether to spend an extra unit of her finite income consuming either artwork that provides intrinsic aesthetic pleasure or artwork that signals cultivated taste to others (i.e. conspicuous consumption) who may in turn award her social status. While the latter choice signals to other agents that she has the quality of cultivated taste, this may or may not be true. Cultivated taste is defined here as a 'genuine appreciation for artistic refinement and excellence', a quality that higher classes have oft used to "differentiate themselves from the lower classes". Agents incur "costs" from signalling cultivated taste which increase with the artwork's distance from their intrinsic aesthetic pleasure (formalised as an individual bliss point). Thus, an agent who truly possesses cultivated taste incurs a lower cost from conspicuous consumption than an agent who's intrinsic aesthetic pleasure lies much further afield. If other agents believe that her conspicuous consumption choice aligns with what really brings her intrinsic aesthetic pleasure, they award her social status. The signalling model is appropriate in this context because her intrinsic aesthetic pleasure is unobservable, thus, other agents must make *inferences* as to whether cultivated taste is in her preferences. It is worth repeating that public perception cares only about her underlying preferences and not about her consumption choice *per se*. There are two justifications for this premise. First, it is natural to imagine that if an individual pretends to have cultivated taste and is found out to be a phoney, her social status would be stripped away. Second, an individual's future consumption of artworks will be determined by whether she truly does have cultivated taste in her preferences, not by some audit of her past consumption choices. This is important to other agents because they wish to stay on trend. Bikhchandani et al., trends result from

individuals obtaining information by watching one another's choices and imitating those who are believed to be better informed" (Bikhchandani, Hirschleifer, & Welch, 1992).

With the aforementioned assumptions, the signalling model predicts that when status is a sufficiently important preference, many agents conform to homogeneous consumption choices, despite underlying heterogeneity in which artworks bring them intrinsic aesthetic pleasure (Bernheim, 1994). Note that an endogenous property of the model is that perceived cultivated taste varies discontinuously with consumption choice. Intuitively, individuals are willing to consume artworks that differ from their intrinsic valuation because they know that even small deviations from the current trend will damage their social status. Despite this penalty, agents with sufficiently extreme preferences over intrinsic aesthetic pleasure will refuse to consume conspicuously and they will express their true tastes for artworks. There are two mathematical criteria for equilibria to emerge: (1) the consumption choice function is optimised given the utility and inference functions, and (2) the inference function is deduced from the consumption choice function according to Bayes' Law. A consequence of the agents facing a continuous choice set is that an interior solution is produced, in other words, incomplete separating equilibria. Intuitively, even the obstinate individualists do not entirely consume 'art for art's sake'; they allocate some of their income towards conspicuously consuming artwork that signals cultivated taste. One can therefore think of individuals as having varying fractions of their willingness to pay constituted by private aesthetic value and common aesthetic value.

Which artworks are selected as the equilibrium conspicuous consumption choice? The median voter theorem would suggest that if individuals are distributed across a continuum of which artworks bring them intrinsic aesthetic pleasure, and individuals confer social status to those who's tastes are perceived to be similar, then the individuals who possess inclinations in the centre will have more like-minded individuals than those at the extremes. According to Schelling's seminal work in 1960, when multiple equilibria are possible, the one that is selected is the one that is most focal – for example, social norms of the immediate past are focal because they require less mass coordination to resurface compared to the social norms of previous millennia (Schelling, 1960). The calibration of preference parameters predicts whether the equilibrium consumption choice will be persistent and widely followed (a custom) or transitory and confined to a small group (a fad). This suggests that trends might evolve in response to the distribution of intrinsic aesthetic pleasure preferences, and that extensions of the model might explain the development of subcultures each with their own distinct norm. By specifying intrinsic and social factors in agents' utility function, the model is capable of explaining why conformity characterizes demand for artworks more than demand for other goods and services and why there is a wide range of possible equilibrium consumption choices. Whether demand for premium artworks is truly influenced by Veblen effects can only be confirmed through empirical analysis. Nevertheless, the model suggests that it is not only the collusive or oligopolistic market structure that explain high prices for aesthetically equivalent art objects, but that it is a feature of demand. Art is a strong candidate for indirect tax policy because its demand is fairly inelastic to price rises, by virtue of being a luxury good, and its demand is unrelated to demand for other consumption goods and services (Ng, 1987).

An alternative to a signalling model that could explain trends in common aesthetic value relies on recent advances in game theory. To better understand how conformity propagates or dissipates in a population over time, one can conceptualize a temporally dynamic network in which homogeneous players select strategies (which represent artistic tastes) with an aim of coordinating and that give rise to particular equilibria. Specifically, a player's payoff (the analogue of social status) can be specified to depend complementarily on the strategies of others in order to model utility derived from

conformism. (Note that rather than rationalizing how conformity arises as a result of preferences for status, we now restrict our attention to how existing conformity may expand or contract.) In an equivalent setup, (Jackson & Yariv, 2007) finds that when the network is highly connected, and players face low costs to switch strategy, there is fast convergence to equilibrium. This finding may help to explain why trends in taste, often of low financial or psychological cost to change, typically diffuse fastest in large, highly connected cities. An idea resembling that of (Kandori, Mailath, & Rob, 1993) is to introduce a small probability in every time period that an existing player exits the game and is replaced by a new player using an arbitrary strategy. If, by chance, a great number of strategies change in any of the time periods, this could sufficiently perturb the network for it to converge to a new equilibrium. In the words of Bernheim, "sufficiently small changes will not affect the social norm, but large changes will upset the norm" because "when norms are widely obeyed, they are persistent" (Bernheim, 1994). The latter framework may, at least in part, illuminate the evolution of orthodox and avant-gardist fashions in the history of art. Note that I am intending to display how game theory might have potential in future work, for it is not a frequently applied tool in contemporary Cultural Economics.

Let us now turn our attention to the aspect of art demand detached from aesthetic considerations entirely. This is the portion of a consumer's willingness to pay for an artwork deriving from financial motives, including storing wealth or yielding profit. In theory, art assets appear to boast pecuniary benefits. In the UK, owners of artworks are exempt from paying property or inheritance tax on them provided they do not refuse public access. Purchasing and lending artworks to galleries is also a way for owners to circumvent storage costs. While artwork cannot be used as a unit of account in the valuation of other goods and services, for it is a heterogeneous commodity that struggles even with its own valuation, artwork can be used as collateral in order to obtain loans. However, art assets are illiquid because of barriers to exchange such as imperfect information and auction fees.

Econometric research has investigated the short run and long run dependency between the art prices and the income distribution. In a comprehensive analysis, Goetzmann et al. ask whether art truly is a concern of society's richest, by measuring three proxies that could impact the buying power of UK art collectors (Goetzmann, Renneboog, & Spaenjers, 2011). The first proxy is the performance of British equities. (In the US for example, 93% of stock market dividends go to the wealthiest 10% of households, a statistic mirrored by many advanced economies.) The second and third proxies are income inequality and top incomes over time. Their results suggest that in the short run, the *lag* of equity returns and income inequality both significantly increase art prices. In the long run, 1908-2005, the authors discover that "a 1 percentage increase in the share of total personal income earned by the top 0.1 percent triggers an increase in art prices of about 10%". However, for the subperiod 1945-2005 alone, the latter effect of UK income inequality was not present, which the authors conjecture as a consequence of the globalization of demand for British artworks. Strikingly, for any of the subperiods there is a long-term co-movement between the art price index and top incomes, despite the two variables being individually nonstationary. This offers evidence that UK art collectors are analogous with the economic elite.

The empirical literature measuring the financial asset characteristics of art is extensive, but only a small number of methodologies have been consistently applied. The simplest of these comes from Stein (1977) who assumes that auctions random sample from a fixed stock of masterpieces and takes the art-rental rate as an estimate of non-pecuniary benefits. Though he caveats his estimates as being upper bounds because art rental clients are commonly corporations, who could have tax-deduction incentives (read abstract and cite). However, two more sophisticated approaches have dominated the

subliterature. I discussed the strengths and drawbacks of hedonic regression earlier. The second predominant empirical method is repeat sales regression which controls for artwork uniqueness by measuring auction price differentials for the same painting across time. By assembling historical data from auction house sale records, public libraries and museums - originally conducted by Enrique Mayer and Gerald Reitlinger - late twentieth-century studies overcome the low number of observations caused by art's low frequency of trading. The drawbacks of the repeat sales regression method are that it does not account for differences in transaction/auction fees, and it ignores nonrepeat sales or artworks that went to auction but were not bidded for above their owners' reservation prices.

Descriptive statistics reveal that art is a poor store of value against inflation compared to traditional financial assets. Indeed, except for the second half of twentieth century, with its anomalous inflation, the financial opportunity cost of art has averaged 1.5 percent per year since 1650 according. To Frey and Pommerehne's 1989 study. Table 1 exhibits that estimated returns on art vary widely across (and within) time periods and price indexes, indicating a high standard error (i.e. randomness). The annual standard deviation of real returns for art over the twentieth century averaged 35.5%. This is far above American equities: annual standard deviation of the S&P 500 index averaged 19.8%. In general, a riskier asset should deliver a higher rate of return, to compensate the investor for risktaking. Yet, economists consistently calculate long-term mean real returns on art to be below equity, and to only slightly outperform the returns of (almost) risk-free bonds, implying that if the risk premium (expected compensation for the asset's risk) is positive, it must be small. How robust is this conclusion? On the one hand, the initial rise in the price of an established artist's work early in her career may not be captured by repeated sales regression, and larger sample sizes appear not to amplify upward bias (Mandel, 2009). On the other hand, when one considers the selection bias inherent to repeated sales regression (only artworks successful enough to be re-auctioned enter into the sample) and the ongoing maintenance, restoration and insurance costs incurred by art ownership, the risk premium may truly be negative. The results are unchanged when samples of artworks are split into genre-specific subsamples (impressionist paintings or modern art prints, for example).

Despite art investments' underperformance, the asset may still have a place in a modern portfolio. In particular, for diversification purposes. Towards the end of the last century, art assets were thought to have a strong positive correlation with equity markets. Given art's low and volatile returns, multiple economists declared the asset to be "strictly dominated" by equity as an investment choice in a mean-variance-efficient portfolio. However, greater empirical evidence attenuates the perceived riskiness of art and displays that its delayed timing of payoffs compared to equities may be desirable for certain investors. The negative correlation between art prices and 6-month treasury bills suggests they could be substitutable savings assets. When equity prices fall, demand for art as a savings asset rises, reducing the yield of the art asset (Mandel, 2009).

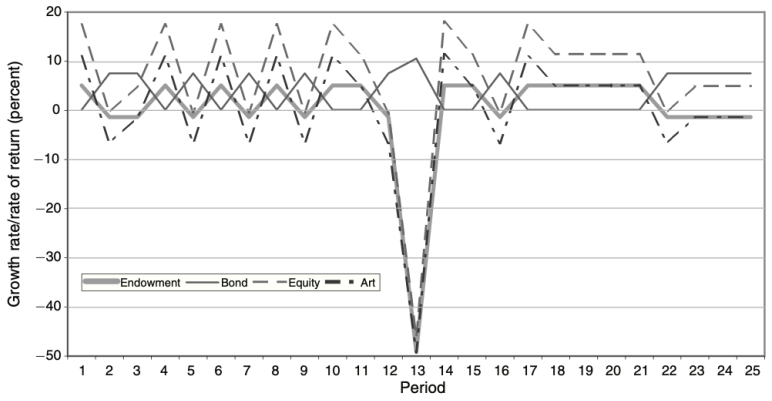
The fact that investment in art persists, despite its financial underperformance, does not necessitate economists to yield their stance of rationality. There is consensus in cultural economics that this suboptimal financial utility is compensated for by nonpecuniary utility that accrues to the owner. To conclude Section IV, I discuss a pricing exercise that, albeit in rough- and approximating-fashion, synthesizes the aesthetic and investment demand factors laid out above. Mandel (2009) surveys more than a dozen papers accepted into top journals that study the price determinants of art and formalizes the empirical regularities in a consumption-based asset pricing model. In its simplest form, a consumption-based asset pricing model describes the risk premium $\{P\}$ for an asset $\{i\}$ to be some increasing function of the covariance of its returns $\{X\}$ and its marginal utility of consumption $\{U'(C)\}$.

$$P_i = f(cov(X_i, U'(C_i))$$

Two of Mandel's initial premises are (1) that art, being a luxury good, has positive income elasticity of demand, (2) marginal utility of art increases with quantity consumed (implying that the utility function is increasing and convex) because of acquired taste, knowledge, or experience. One might expect, then, a positive covariance between returns and marginal utility of consumption, implying a high risk premium. Yet, as outlined earlier in this section, art's observed risk premium is small *or negative*. Rationalizing this empirical puzzle is the motivation of Mandel's paper.

There are two more important premises. First, he presupposes the supply of artworks to be fixed and postulates that dynamic demand is the true driver of returns. He argues that in the upper end of the art market, it is unlikely that resurrected dead artists dilute the existing stock of masterpieces; and in the lower end, living artists are confined to "fad, avocation, and financial ruin" and have negligible bearing on equilibrium prices. Second while art does not offer a stream of financial dividends to its owners - as traditional investments do - it imparts a 'utility dividend' that is increasing in the owned artwork's value. The utility dividend may be interpreted as aesthetic value – be that from intrinsic pleasure or conspicuous consumption. (Note that preferences are defined over quantities and *prices*; a simplification of the common aesthetic value models exhibited earlier in this section, which define preferences over *intrinsic pleasure* or *status* directly.) Augmenting the model with time-dimensionality: in each period, a (risk-averse) representative agent in the economy calculates how much of her stochastically endowed, real income to allocate between a homogeneous consumable good and a portfolio of financial instruments (equities, bonds, artworks). The model then solves for the financial instrument prices that clear the consumable good and each of the financial instrument markets. Therefore, at the margin, the agent decides whether to forego an additional unit of a consumable good that confers direct utility, to instead purchase an artwork that confers utility from both its contemporaneous price and its (discounted) expected price appreciation in the next period.

In simulation, the model generates a low and possibly negative risk premium. Intuitively, an agent who invests in art needs to be compensated less for the risk she is incurring, relative to traditional investments, because of an aesthetic utility dividend. The model produces a volatility of art returns similar to equity because both are dependent on the stochastic endowment of real income.



Simulation of Endowment Process and Asset Returns

Mandel notes: "The figure illustrates 25 of 1 million simulated periods, chosen to bracket a crash state (period 13)." "The model is calibrated to postwar US data, and endowment growth (the think solid line) follows a three-state Markov process with a probability of 0.001 of entering a transient crash state with growth rate 0.5".

However, the model fails to replicate the postwar US data that depicts art returns as being strongly procyclical and an amplification of stock market returns. To increase the standard deviation of art returns, one could specify a higher covariance of the endowment, though this would raise the risk-free returns and the standard deviation of equity far above the empirical data. A second critique is that the previously discussed inherent biases in studying art returns could even be skewing the variance statistic of art returns upwards. The model is consistent, however, with the finding that investment returns on masterpieces underperform the art market. The story is that auction houses upward bias price estimates for the most valuable art collectibles, which inevitably go on to yield lower returns. This phenomenon persists because investors trade off prospective lower returns with conspicuous consumption dividends from the sale. The model is generalisable to any good with a low rate of depreciation that offers non-pecuniary value, including sentimental and decorative. Relaxing the premise of a constant endowment of art would considerably elevate the model's complexity, but such a model would be better equipped for settings with fewer restrictions on supply and could even offer labour market predictions. Mandel concludes succinctly: "the price of art reflects not only the desire to smooth consumption over time as for any investment vehicle, but also the utility derived from its conspicuous consumption."

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