



**The Implicit Value of Art Experts:
the case of Klaus Ertz and Pieter Brueghel the Younger**

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April 2017

ECARES working paper 2017-17

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April 2017

Abstract

Pieter Brueghel the Younger (c. 1564/65 – 1637/38) is a well-known painter who reproduced the works of his celebrated father Pieter Bruegel the Elder (c. 1525/30-1569). We collected the sales of his original works as well as those from his atelier and followers over the period 1972-2015 and compare the prices of two categories of works: his autograph works, and all others, whether partly autograph or untouched by him. Confusion among the types was floating around, since the same compositions exist in many versions and dimensions, and were probably even executed by different painters. In 1997-1998, the German independent art historian Klaus Ertz curated a large itinerant exhibition in four European countries dedicated to Pieter the Younger. At the time, it was known that he was working on a *catalogue raisonné* (CR) of the painter to which he referred substantially, though it came out in 2000 only. We use difference-in-differences estimation to establish that the exhibitions and the information concerning the catalogue had a significant effect on the prices of autograph works. Though we cannot judge whether Ertz's attributions are right or not, it seems that buyers started feeling more confident, since they were ready to pay roughly 60 percent more for works considered autograph after the late 1990s.

JEL codes: C59, Z11

Keywords: Brueghel family, exhibitions, catalogue raisonné, prices, diff-in-diffs identification

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1. Introduction

It is well known that the relation between Italian Renaissance painting famous “expert” Bernard Berenson and art dealer Joseph Duveen who was buying art for John D. Rockefeller, Andrew Mellon, Henry Clay Frick, and William Randolph Hearst was a “hide, seek and make money” relation (see among others Behrman, 1972). But that Berenson may have cheated himself is more surprising, unless it means that he did not have a good eye and was, therefore, not a good expert.

Art historian Gary Schwartz (2016) studied Bernard and Mary Berenson’s personal collection of Italian Renaissance works and their attributions. On the basis of a catalogue of the collection by Strehlke and Israëls (2015), Schwartz concludes that:

“only one of eighty-seven relevant entries is an original Berenson attribution that is still accepted,” adding that “the basis for Berenson’s ‘authority and influence’ [Mary Berenson’s phrase] was his connoisseurship, the bestowal of names on paintings whose authorship is not apparent. The catalogue is sprinkled with remarks about Berenson’s attributions of his own paintings, which were often inaccurate, to the point that he bought a number of outright forgeries.”

Still, he was able to convince Duveen, as well as wealthy industrialists such as Rockefeller, Mellon, Frick and Hearst to pay high prices for the works that they were buying in large numbers and which are now hanging in the Metropolitan, New York, the National Gallery of Art, Washington, the Frick collection, New York, and the Los Angeles Museum of Arts, though some are probably hidden in the reserves as being fakes, copies or, at best “from the master’s atelier.”

In this paper, we are looking at the recent case of the independent German art historian and expert Klaus Ertz (born in 1945) who curated exhibitions and published a *catalogue raisonné* of the works of Pieter Brueghel the Younger who used visual materials from the estate of his father, the famous Pieter Bruegel the Elder, and produced both exact copies and variants of his work. What Honig (2014) mentions about Jan Brueghel, applies as well to Pieter the Younger. His “body of work is uniquely messy: thousands of paintings, hanging in museums and private collections all over the globe, have some claim to be associated with his workshop. Some pictures were produced with the input of independent collaborators, while others were executed in part or entirely by anonymous paid assistants working within the studio. The same composition may exist in a dozen versions of different sizes in different materials from different dates and executed by different individuals.” It is therefore quite difficult to disentangle works by Pieter the Younger from those that were produced in his atelier, or even after he died. In the 1980s, Klaus Ertz tried to bring some

clarity, and whether right or wrong, succeeded well in his endeavor.

The paper is organized as follows. Section 2 is devoted to the art historical background of the Brueg(h)el family with emphasis on Pieter the Younger. Although his copies after his father's prototypes were particularly sought after during his lifetime, the artist was long neglected by both art historians and the market until his rediscovery in the early 20th century. We delve into some necessary details dealing with his slow revival consecrated by Ertz's work. This shows that it takes time to recover from oblivion; our study empirically shows that new research about an artist can suddenly recreate his fame. Section 3 describes the data, which are analyzed in Section 4 to calculate the "Ertz effect" using a diff-in-diffs identification strategy. Section 5 is devoted to conclusions.

2. The Fall and Rise of Pieter Brueghel the Younger

Pieter Bruegel the Elder, one of the most eminent Flemish masters, enjoyed considerable success during his life-time. He indeed succeeded in offering a personal depiction of the peasant life in the Southern Low Countries during the 16th century, with substantial documentary interest and symbolic underlying content. His singular brushworks and fascinating interpretation of rural scenes, contrasting with the contemporaneous Italian classicism and ideal of beauty, contributed in edifying his name and visual identity as a unique "brand". Although his paintings were highly sought-after during his life-time—and were commissioned and collected by major historical figures such as the cardinal Antoine Perrenot de Granvelle, governor of the Spanish Netherlands, or the Flemish humanist and patron Nicolas Jonghelinck—only about 45 autograph paintings are authenticated. Most of them, such as *The Fight between the Carnival and Lent* (1566), *The Massacre of Innocents* (1565-1567) or *The Peasant Dance* (1568), are hanging in well-known museums: the Royal Museum of Fine Art in Brussels and the Kunsthistorisches Museum in Vienna, which inherited the collection of emperor Rodolphe II. Autograph pictures by Pieter the Elder have been therefore rarely offered at sales.¹ Despite this lack of immediate visibility, Brueghel's heritage considerably shaped the idiom of Flemish art (Silver, 2006). His style was reinterpreted in various ways by his relatives, contemporaries and close or later followers such as Pieter Balten Maerten van Cleve (1527-1581) and David Teniers the Younger (1610-1690).

The artistic accomplishment of the Elder was kept alive by his son, Pieter Brueghel the Younger, who was aware of the economic potential of pursuing his father's work and

¹ Drawings are quite often traded, but no autograph painting appeared on the art market for very long. In July 2011, a rediscovered lost original surfaced for sale. The painting belonged to a Flemish nobleman and depicts a Flemish proverb *The Drunkard pushed into the Pigsty*. This 18cm diameter *tondo* fetched £3 millions at Christie's. For further details, see Christie's King Street, *Important Old Master Pictures*, sale 6604, 10 July 2002, lot 37.

using his name as a brand. After registering at the Saint-Lucas Guild of Antwerp in 1585, and in order to satisfy the insatiable demand for Breughelian pictures, Pieter the Younger launched his own business, initiating a new way to “divide” labor that became typical in the 17th century Dutch and Flemish workshops. Commonly known as the *Brueghel’s enterprise*, Pieter the Younger started working in close collaboration with nine employed assistants from 1588 to 1626, creating a true *Brueghel mania* on the market around 1600 (Ertz and Nitze-Ertz, 1998, p. 17). Although the specific labor distribution in (and outside) his studio is still discussed among scholars, it inevitably generated an extensive number of works of variable quality, signed or not,² based on his father’s celebrated prototypes or on free interpretations of his style and iconography. Though these pictures were strongly sought-after at the turn of the 16th and during the 17th centuries, they appear to have been relatively low-priced compared to those of other artists, as stated in some archives.³ On the other hand, some records reveal the difficulty of buying genuine paintings by the Elder given that their scarcity and very high prices.⁴ The low valuation of Pieter the Younger’s work and his presence on the low-end market indicates that his pictures were considered as cheap multiples without much creative value.⁵ This status had already been reported by historiographer Karel van Mander (1604) who, in his *Schilder-Boek*, described the artist as a capable copyist and imitator of his father, after erroneously identifying him as a portrait painter working from nature.⁶ It is therefore difficult to believe that after such success during his life, his name disappeared from our collective memory in the mid-18th century, after a decisive shift in tastes. The modest status of copyists and copies was accentuated in the late 18th and 19th centuries with the romantic vision of the artist as an individual genius, which did not help rehabilitating Pieter the Younger’s personality and talent. Contrary to other Old Masters who used to be explicitly depreciated by critics and scholars for their lack of originality, such as Michel Coxcie,⁷ Pieter the Younger was almost never considered nor even mentioned in the main historiographical sources. And as demonstrated by Haskell (1976), damaging opinions expressed by scholars or substantial lack of knowledge about an artist’s life and career usually have negative consequences on his reputation and collective reception. The

² The signature played an ambivalent role in Brueghel’s production. While a signature did not mean that the work was effectively executed by the artist, Pieter Brueghel changed his way of signing, starting with P. BRVEGHHEL before using P. BREVGHEL, right after 1616, probably to differentiate himself from his father. See Allart et al. (2013, p.139).

³ Old inventories, for instance, show evidence of the low-valuation of Pieter Brueghel the Younger with a *Village Lawyer* estimated 24 guilders while landscapes by his brother Jan I could reach 600 guilders. See Folie (2001, p. 44).

⁴ The most famous testimony known is extracted from a letter between the provost Morillon and his superior Cardinal Granvelle, dated 9 December 1572: “Il ne faut plus que vous estimiez recouvrer des pièces de Brueghel, sinon fort chèrement: car elles sont plus requisees depuis son trespas que par avant, et s’estiment 50, 100 et 200 escus, qu’est charge de conscience” (Piot, 1884, p. 524).

⁵ Van Miegroet and de Marchi (1966) studied the reception of originals and copies during Pieter Brueghel’s activity. See also Van den Brink (2001).

⁶ “By veel zijns Vaders dinghen seer aerdich copieert en nadoet.”

⁷ See Carpreau (2014, pp. 10-21).

indifference experienced by Pieter the Younger and partly by his father during the 18th and early 19th centuries art market is shown in Figure 1: with a few exceptions between 1770 and 1790, the price index is flat.⁸

[Figure 1 about here]

At the time, Dutch masters were much more fashionable and sold for higher prices,⁹ revealing a shift in taste, especially for genre scenes. In 1752, the Marquis of Argens confirmed this shift in arguing that Teniers had been fashionable for long, then came Wouwerman, Poelenburgh, Dou, Mieris but at the time Ostade, Metz, Potter, Van de Velde, Van der Werff were the most sought after artists, particularly coveted by collectors.¹⁰ The market for Pieter the Younger did not change substantially throughout the following decades and the low prices fetched by his works at auction did not induce Gerald Reitlinger (1961) to include the artist in his *Economics of Taste* while his paintings had however circulated for centuries on the art market.¹¹

According to Haskell (1976), the (re)discovery process of an artist can be sudden or cyclical, depending on taste and cultural trends, but is, always circumstantial. Pieter the Younger is an example of an artist entering the canon in later periods, when art scholarship started understanding his own idiosyncrasy and the historical importance of his art.¹² The academic re-awakening of the family's name and the rehabilitation of the Flemish Primitive school came with a consecrating exhibition in Bruges in 1902.¹³ Approaching Pieter the Younger is particularly relevant here, since his rediscovery is intrinsically linked to the art market itself. Indeed, his extensive production appeared to be a profitable but still under-exploited asset, offering an appealing alternative to old-fashioned and strictly religious pictures. Eminent scholars started devoting part of their research to Pieter the Elder, which renewed the interest in his production, and progressively in the work of his son.¹⁴ The very

⁸ Data are extracted from the Getty Provenance Index database and concern works related to Pieter Brueghel the Younger and Pieter Bruegel the Elder's names. Our dataset runs from 1700 up to 1839 and totals 285 observations (156 for Pieter the Younger and 129 for Pieter the Elder). Original prices are converted in fine gold's grams and indices are based on price averages.

⁹ Among others a *Wedding* scene by Teniers the Younger sold for 2,500 livres in 1737 and a *Horses Market* by Wouwerman for 14,500 in 1766, while Pieter the Younger prices did not reach more than 200 livres. See Lyna et al. (2009, p. 129).

¹⁰ Quoted by Brookner (1972, p. 41).

¹¹ In contrast to the son, some works by Pieter the Elder sold at auctions are listed in Reitlinger (1961). Ginsburgh and Weyers' (2010) paper on the reputation of Flemish artists, does not include Pieter the Younger either since the artist was not systematically listed in major reference-books. Pieter the Elder, on the contrary, gets the second position of their ranking, preceding Rubens and outstripping Van Dyck.

¹² Changes of reputation over time are studied by Silvers (1991). Brueghel's case corresponds to the revelation of "unnoticed meritorious and agreeable properties of his work." See also Ginsburgh and Weyers (2006a, 2006b, 2010) for empirical analyses.

¹³ On the historical rediscovery of Flemish Masters, see Ridderbos et al. (2005).

¹⁴ For a non-exhaustive list of the pioneer publications on Pieter the Elder, see among others, Van Bastelaer and de Loo (1907), Dvorak (1921), De Tolnay (1935), Gotthard (1938) Van Beselaere (1944) and Grossmann

first exhibition that intended to break with the artist's tarnished image was held in 1934, at the initiative of the Amsterdam-based dealer P. de Boer, and by Gustav Glück, curator of the Kunsthistorisches Museum Wien and author of *Bruegels Gemälde*, published two years earlier.¹⁵ Dedicated to the work of Pieter the Younger and Jan the Elder,¹⁶ better known as Velvet Brueghel, the show, displayed by de Boer, encompassed more than forty paintings from public institutions and private collections. It is commonly acknowledged for being the first endeavour that shed some light on this under-studied production. It however took several years before significant scientific initiatives were carried out.

The first Belgian scholar who dedicated a large part of his career to the study of Pieter the Younger was Georges Marlier (1898-1968) whose monograph was posthumously edited by Jacqueline Folie in 1969, in partnership with the Brussels-based merchant Robert Finck. In the same year, a retrospective exhibition was dedicated to the painter's career, commemorating the 400th anniversary of the death of Pieter the Elder.¹⁷ In the wake of Marlier's (1969) monograph, Finck curated a new show in his own gallery showing 33 paintings executed by the Pieter the Younger.¹⁸ The show was warmly received by the Belgian community of scholars and collectors. Marlier's brave attempt to categorize the huge amount of paintings by Pieter the Younger and his atelier represents a decisive step in understanding the artist's production. Marlier succeeded in tracing back more than 400 works, preserved in public and private collections or recorded in sales catalogues, and sorted them into categories based on iconographical purposes to understand the macrostructure of the artist's work and enable further research. The art historian's main concern was to identify and attribute paintings, making sure that they were fully or partly executed by the son and not by the father. In contrast with the classification used by salerooms, Marlier's attribution system was not based on an authenticity scale defined by qualifiers. He opted for a classification based on signature and date (*signed and dated* pictures, a substantial part of the works recorded, *unsigned and dated* pictures and *unsigned and undated*). Though some unintentional misattributions have been detected since, Marlier provided a first academic and comprehensive catalogue whose reception by the auction market seems to have started in the mid-1970s, at the time the market Impressionist, Modern and Contemporary art was experiencing its first boom, while the Old Master segment was stagnating and even progressively declining.¹⁹ This, however, generated a few important exhibitions devoted to the Breughel family including Pieter the Younger. In 1980, *Bruegel. Une dynastie de*

(1955). Hulin de Loo stressed the importance of the role played by the son to better understand the work of the father.

¹⁵ See Glück (1932).

¹⁶ See P. de Boer (1934).

¹⁷ See Coune et al. (1969).

¹⁸ A catalogue of the exhibition was prepared by Finck himself. See Finck (1969).

¹⁹ See Wood (1997).

*peintres*²⁰, was organised in Brussels (see Robert-Jones et al., 1980). For the first time, it brought together four generations of the family. A couple of years later, in 1993-1994, Pieter the Younger continued to be at the centre of academic attention with a new selection of autograph paintings exhibited at the Bonnefantenmuseum in Maastricht, with a modest exhibition catalogue.²¹ This is the very first show entirely dedicated to the artist by a public institution although it had very little influence on prices fetched at auction, as can be seen in Figure 2. In spite of the growing attention paid to the artist, the copying process, an inherent practice of the Brueghel's family, remained largely unexplored. In the mid 1990s, substantial questions were actively debated at an international conference, *Breughel-Breughel*, held in Japan during the exhibition *Masterpieces of Flanders' Golden Age*. In 1995, the Tobu Museum of Art of Tokyo organised an exhibition *Brueghel's World*,²² showing works from the most respected Belgian collection of Flemish art (the baron Evence Coppée's collection²³), including several masterpieces by Pieter the Younger and his followers, which had been subject to in-depth studies before the event. Between 1997-1998, an itinerant show *Breughel-Brueghel: Une famille de peintres flamands vers 1600*, curated by Klaus Ertz—the artist's new leading expert—travelled throughout Europe (Essen, Vienna, Antwerp and Cremona). The international dimension of the exhibition conferred unprecedented visibility to Pieter the Younger and his brother Jan the Elder. Catalogues were published in four languages and are nowadays considered a reference contribution to the Brueghels' historiography.²⁴

Beyond the intellectual excitement surrounding Pieter the Younger, it is worth pointing out that most of these exhibitions were only partly dedicated to him. They rather intended to emphasize the relationships between the father and his sons, presenting them as a dynasty. Still, they generated an obvious interest around the artist and increased his visibility worldwide, in conjunction with auctions such as the sale of the De Pauw Collection at Sotheby's in 1986.²⁵

It was only at the very end of the century that this academic excitement culminated with the publication in 2000 of a *catalogue raisonné*, exclusively dedicated to Pieter the Younger by Klaus Ertz (2000), in the light of research conducted after Marlier's *catalogue*

²⁰ *Bruegel. Une dynastie de peintres en Belgique* (1980), cat. exhib., Europalia 80, Brussels, Musée Royaux des Beaux-Arts de Belgique.

²¹ J. Folie (1993), *Pieter Brueghel de Jonge*, exhib. cat., Maastricht, Bonnefantenmuseum.

²² See Tobu Museum of Art (1995).

²³ For a special focus on the Coppée Collection, see Leclercq and Wilmotte (1991). Several major art pieces have been since offered at auction and went for a couple of millions during the prestigious Old Master Week organized by Sotheby's relayed by national media and the specialized press. See C. Gleadell, Art Sales: It's the year of the Brueghel, *The Telegraph* (posted on 08 April 2014, consulted on 25 January 2017), online: <http://www.telegraph.co.uk/luxury/art/30085/art-sales-it's-the-year-of-the-brueghel.html>.

²⁴ See Ertz and Nitze-Ertz (1998).

²⁵ More than fifteen works by Pieter the Younger and from his studio, as well as works by Pieter Brueghel III, and followers of Pieter the Elder were put on sale. See Sotheby's King Street (London), *Old Master Paintings including the Collection of the late Charles De Pauw*, Wednesday 09 April 1986.

raisonné.²⁶ According to Van den Brink (2001), Ertz was the first scholar and expert who decisively restored the artist's greatness. Recording more than 1,400 pictures, all types of attributions included, the two-volume catalogue, distributed through the author's own publishing company,²⁷ has become the most-referred to book by art historians, experts, dealers and salerooms to authenticate Brueghel's paintings. Though it is far from being exhaustive, the author enlarged the already known *corpus* of Pieter the Younger. He certified, disproved or reassessed attributions previously provided by Marlier, authenticated newly discovered works, upgraded low-attributed works or downgraded overoptimistic attributions. Although technical investigations were already exploited at that time by scholars to endorse the relevance of a given attribution, Ertz's expertise, like Berenson's or Friedländer's, is mostly based on his eye's experience due to his familiarity with the work of Pieter the Younger. His system of attribution is no longer based on signature and date but on a three-category system: 'E' for *echt* qualifying autograph works, 'F' for *fraglich* or doubtful works and 'A' for *abzuschreiben*, for non-autograph or de-attributed works. Capitals followed by an asterisk mean Ertz saw the original picture, otherwise his expertise is only based on photographs which could shed some doubt on the attribution. In accordance with a traditional connoisseurship's mentality, this system reinforces an outdated antagonism between genuine and non-genuine items—the rights and the wrongs—without considering all the shades offered by qualifiers traditionally used by the art market, even if the author sometimes specifies his attributions in evoking the quality of skilful followers. Nonetheless, the system does not prevent salerooms from soliciting as frequently as possible Ertz's expertise, and the first references to his *catalogue raisonné (CR)* appear in salerooms' catalogues in 2000 only. Indeed, the monumental sum compiled by the independent scholar makes it possible for salerooms to refer to an external voice without being responsible or liable in case of misattribution, although in-house specialists are not forced to agree with the opinion of a leading expert if they are able to argue in favour of another attribution.²⁸

The last research project in date, based on the new connoisseurship approach, is conducted in Brussels by two scholars specialized in the technical analysis of paintings. They try to re-evaluate the creative process of the Elder, identify the copying practices of the Younger, and re-examine the working-procedure of the Elder in the light of the Younger's copies.²⁹

²⁶ Krauss (2004, p. 66) distinguishes two main categories of *catalogues raisonnés*, those which replace old literature and those which document undiscovered or neglected Old Masters. In our case, both objectives are of concern.

²⁷ This informational detail must be pointed out. Many scholars consider that *catalogues raisonnés* should be exclusively published by university presses or academic publishing companies, and regulated by peer-reviews. See Krauss (2004, p. 65).

²⁸ See Bandle (2016, pp. 61-62) for details.

²⁹ See Currie and Allart (2012).

This overview of Pieter the Younger's historiography throughout the 20th century emphasized the role played by scholarship in the rediscovery of a long-neglected artist and the creation of a visual brand: the Brueghel family. As a consequence of the artist's *modus operandi* and large-scale production, paintings by him or attached to his name appear on the market, with an average of more than 10 fresh lots every year. In comparison with the rest of the European Old Masters whose market is less liquid and speculative, and fetches lower prices,³⁰ the market for Pieter Brueghel the Younger can be considered paradoxical, since it is not directly concerned with the scarcity of high-quality works. Indeed, the current market is able to offer for sale 60 percent of autograph works (See Table 2), many of them being signed and dated, but still, Brueghel's replicas and variations after his father enjoy a considerable success, fetching higher prices than most other copies.

In the light of both the academic and economic situation of Pieter the Younger's fall and revival, we now turn to the question about whether art historical research, such as exhibitions or/and Ertz's *CR* had a significant impact on sales and increased the (monetary) value of the artist.

3. Data

We collected data concerned with 679 works sold at auction between 1972 and 2015. Table 1 gives an overview of the dataset in terms of the characteristics of the works. Since our research concentrates on autograph and non-autograph works, we distinguish the number of observations according to what is mentioned in sales catalogues, not in Ertz's *CR*. One painting was sold with an authenticity certificate issued by Ertz before the *CR* was published in 2000. Table 2 makes the same distinction showing the number of works sold and their average price in every year between 1972 and 2015.³¹

Each work is described by the following characteristics (dummy variables, with the exception of dimensions) recovered from the sales catalogue of the auction house in which it was sold:

- (a) Dimensions: height and width;³²
- (b) Signed;
- (c) Dated;
- (d) Mention of provenance (that is, of previous owners with dates of the transactions);
- (e) Previously exhibited;

³⁰ For further comments on the supply and demand for the market for Old Masters, see Hope (2005, pp. 195-213).

³¹ Prices are deflated using the US CPI and are expressed in 2015 US dollars.

³² For the few circular and oval works, dimensions are characterized by their diameter (for circular works) and the two perpendicular axes (for oval works).

- (f) Described in the literature;
- (g) Sold with certificate;
- (h) Submitted to scientific investigation;
- (i) Type of support: panel, canvas, copper, other;
- (j) Type of technique: tempera, oil;
- (k) Type of painting: landscape, moralizing genre scene, biblical scene, peasantries, other;
- (l) Saleroom: Christie's London, Christie's New York, Other Christie's, Sotheby's London, Sotheby's New York, Other Sotheby's, Bonhams, Dorotheum, Drouot, Koller, Lempertz, Philips, Piasa, Tajan, Other.

Attributions made by salerooms are often graded as follows in their sales catalogues: by the artist, by the artist and studio, attributed to, workshop of, circle of, follower of, manner of, after, and mixed.³³ We regrouped them into two categories: by him, that is by Brueghel, and Others, which appear in the columns of Tables 1 and 2.

With the exception of prices and dimensions, each characteristic is described by a variable that takes the value one (if the characteristic is present) or zero (otherwise).

[Tables 1 and 2 about here]

It is worth noting that more autograph works per year were sold after 1999 than before (11.3 against 8.8) and the same is true for non-autograph works (7.1 against 4.8), though there were highs and lows in both sub-periods as can be verified in Table 2. Fifteen works were auctioned in 1999 after four exhibitions curated by Ertz in 1997 and 1998. The average price of autograph works jumped from \$510,000 before 1999 to \$1,380,000 after and including 1999.

With three exceptions, average prices are smaller than one million dollars before 1999 (and usually larger than one million after 1999 with exceptions in 2002, 2003, 2007 and 2015). The exceptionally high average prices in 1980, 1990 and 1997, are due to expensive outliers. We should not be concerned with 1980 and 1990, but with 1997, since it is close to the possible "Ertz effect." In 1997, only five works were sold; one of them, the outlier, fetched \$4 million, while the others were in line with the previous years, and were sold at an average price of \$750,000. So it is unlikely that the possible "Ertz effect" took place there.

³³ Auction house's glossaries may sensibly differ from one to the other, depending on their authenticity warranty, but attribution entries can be basically summarized as follows: in their opinion, *By* means a work by the hand of the artist ; *Attributed to* probably a work by the artist in whole or in part but with less certainty ; *Studio of* is their opinion on a work by an unknown hand in the studio of the artist which may or may not have been executed under the artist's direction; *Circle of* is a work by an as yet unidentified but distinct hand, closely associated with the named artist but not necessarily his pupils ; *Follower of* is a work by a painter working in the artist's style, contemporary or nearly contemporary but not necessarily his pupil; *Manner of* is a work executed in the style of the artist but of a later date ; *After* qualifies a copy of any date of a work of the artist.

4. Empirical Analysis

The main objective in what follows is to evaluate the implicit value of Ertz's expertise. As mentioned above, in 1997-1998, he curated an itinerant exhibition focused on Pieter the Younger and his brother Jan in partnership with local museum curators in four European cities: Essen, Vienna, Antwerp and Cremona. He published similar exhibition catalogues for the three first exhibitions, and another one, slightly different for the Cremona exhibition. In 2000, he finally published his *CR* that separates works *by* Pieter the Younger (autograph) from those that are *doubtful* or *not by* him (regrouped in *Other*), but the results of his *CR*, mentioned as "Klaus Ertz (forthcoming), Luca Verlag, 1998" are already used to comment some works exhibited in 1997-1998. Establishing a *CR* indeed requires many years. According to his wife Nitze-Ertz (2017), he started working on his *CR* in 1988, but since he had previously worked on Jan the Elder, he must already have gathered information on Peter the Younger. Three autograph works sold in 2009 and 2015, that is *after* the *CR* was published in 2000, are accompanied by certificates written by Ertz *before* 2000 (in 1989, 1994 and 1997). These certificates could therefore have no influence on prices. One additional work, sold in December 1998, carried a certificate signed by Ertz in 1993,³⁴ which mentions that the work is by Pieter the Younger, and will be published and illustrated in the *CR*. In order to show that our results are not driven by this observation, as a robustness check we run a regression by excluding this possible outlier (see Section 4.2).

It was thus known that Ertz was working on his *CR*, but not much detailed information filtered through before its publication. All the others certificates of works that appeared at auction were signed by Ertz after 2000, and could hardly have had an influence on prices, since they carried little additional information with respect to the one contained in the *CR*.

We consulted with Alexis Ashot (2017), Specialist in the Old Master Paintings Department at Christie's London, to infer at which date both the exhibitions curated by Ertz in 1997-1998 and his *CR* could have had an impact on prices. This is his opinion:

"with certainty, that in the ten years I've worked at Christie's, Dr. Ertz has played a vital role in driving the market for [Pieter the Younger]. It is difficult to say when this started...I would assume that people were already seeking his opinion in the 1990s, but I agree that one rarely sees his opinion cited in [sales] catalogue entries of that time. This may also have to do with the changing pressures on auction houses to independently verify

³⁴ Here is what is mentioned in the saleroom catalogue for this work sold at \$682335: "The present work is sold with a photostat of a certificate by Dr. Ertz, dated 16 March 1993, in which he concludes: "Mit der Bestimmung 'Eigenhändige Arbeit Pieter Brueghels d. J. entstanden nach 1616' werde ich dieses Gemälde in dem in Vorbereitung befindlichen Oeuvrekatalog der Gemälde Pieter Brueghels d. J. publizieren und abbilden'."

their cataloging, which affected all the artists we sell, not just Brueghel... Ertz is frequently cited for his opinion based on the viewing of lots which are not necessarily published, and this added a special element to the Brueghel market because now there was someone who could revise or confirm old attributions, with all the implications this has for the valuation of a picture... In practice, we make our own conclusions, and approach Dr. Ertz only for those lots where we do not feel 100% sure. References to Marlier's catalogue published in 1969 are fundamentally different" and must have had much less influence.

The reason for a possible effect on prices is that works bought after the four exhibitions in 1997-1998 and Ertz's publication have a larger probability to be *by* the painter. Therefore, they fetch a higher price in and after the pivotal year than other works, since buyers feel there is less uncertainty, one of the many factors that increase the marginal willingness to pay a work by its buyer, and thus its price, though there is no guarantee that the attribution will never change later on. Ashot (2017) also adds that

"this can create a gradation of commercial value, where (theoretically) a painting which we sell as right but which Ertz has not seen or certified might sell for less than the same painting which we sell as right *and* with an Ertz certificate, because the latter would attract the additional bidders who might want the added guarantee."

Given the likely effect of the four exhibitions organized by Ertz in 1997-98, supported by the opinion of Christie's Old Masters specialist that exhibitions probably had a larger influence than the publication of the *CR* in 2000, in what follows we assume 1999 to be the pivotal year in which the gap between autograph and non-autograph works may have increased. We will also provide some robustness checks in Section 4.2 concerning the year of the change. The qualitative results of our analysis will not change.

4.1 Main Results

We start with a description of what happened over the period 1972-2015 for which we collected prices. Figure 2 shows two price indices, obtained by indexing (logged) prices with a common value equal to 100 in 1969-1978, and averaging every 5 years for autographed and non-autographed works *by* or close to Pieter the Younger. As can be seen, there is an upward jump for autograph works around 1999. The differential shift in prices can also be seen in Figures 3 and 4. The former shows the change in the distribution of (logged) prices before and after 1999 for non-autographed works, which remains substantially unchanged. On the contrary, Figure 4 shows the change after 1999 for autographed works. One can see that the

distribution has moved to the right. Notice that the shape of both Figures 2, 3 and 4 is robust to a change of the pivotal year to 1998 or to 2000.

[Figures 2, 3 and 4 about here]

Figure 5 shows more directly what our empirical strategy aims to identify. We computed two trend lines for non-autograph works, one with a break in 1999 (short dashes), the other with no break (longer dashes). The two types of trends can hardly be distinguished, and we can safely assume that the trend for non-autograph works did not change in any significant way in and after 1999. One may obviously infer that Ertz's exhibitions curated in 1997-98 and his forthcoming, but not yet available, *CR* may have played a role in what happened to prices of autograph works.

[Figure 5 about here]

The conclusion that one may reach from this initial descriptive analysis is that, until 1999, autograph and non-autograph works follow a very similar trend, though works assumed to be autograph by salerooms' specialists are more expensive. It seems thus reasonable to assume that, with the exception of the jump for autograph works, not much else changed. Moreover, non-autograph paintings seem to constitute a natural comparison group for the group affected by the exhibitions and the publication of the *CR*. This is so not only because the common trend assumption is evidently satisfied, but also because before the late 1990s there was much confusion between what an actual genuine work was, which created more uncertainty and market risks, and hence there was no reason for these two groups to have a different price trends. This changed substantially after the work by Ertz, especially for autograph pictures, since he participated in distinguishing and identifying Pieter the Younger's *hand* and autograph core work (until proven otherwise), given his long acquaintance with the art of the Brueghel family. In his essay, Friedländer (1942, p. 180), the great connoisseur of early Flemish art, already had insisted on the fact that "every work of art has a financial value which largely depends on the view taken of its authorship." It is therefore necessary to point out that authorship and authoritative attribution have always been valuable on the art market and particularly prized by collectors since they guarantee the proper involvement of the artist in his work as well as the traces of his artistic genius (Keen, 1971). Consequently, the authentication of a piece of art as genuine by and its subsequent inclusion in a *CR* is expected to have critical effects on prices and increase the confidence of the buyer (Noël, 2014, pp. 260-263).

In order to make these intuitions more precise, we use *difference-in-differences* estimation to measure the effect of Ertz's interventions. The basic equation can be written:

$$p_{it} = \alpha + \beta B_{it} + \gamma T_t + \delta B_{it} \times T_t + \varepsilon_{it}, \quad (1)$$

where p_{it} is the (logarithm) of the price of a work i (by Pieter the Younger or not autograph) sold in period t , B_{it} takes the value 1 if work i is by Pieter the Younger, and 0 if it is not, and T_t takes the value 1 for every year after the possible Ertz's effect, and 0 otherwise (1999 in the main results). Therefore, the parameter δ gives the value of the price change of a work by the Younger sold after Ertz, while α, β and γ are other parameters to estimate. The last term ε_{it} in (1) is a random disturbance, satisfying the usual assumptions.

The full regression equation will contain other variables as well. First, we have to account for yearly effects on the level of prices. Secondly, we also introduce in (1) the control variables (called hedonic variables³⁵) described in Section 3 and displayed in Table 1. These are meant to homogenize as most as possible different works sold over time. The equation above will thus also contain annual dummy variables Y_t for the general yearly effects on prices as well as some 30 variables X_{it} which represent the other hedonic (a) to (l) variables described in Table 1. In all regressions, the observations are weighted by the number of paintings sold in the year. Standard errors are clustered at the year level.

$$p_{it} = \alpha + \beta B_{it} + \gamma T_t + \delta B_{it} \times T_t + Y_t \zeta_t + X_{it} \theta + \varepsilon_{it}. \quad (2)$$

Table 3 contains the results of our main regression. We mainly focus on whether Ertz's expertise (his exhibitions and his forthcoming, but already discussed, *CR*) had an influence on prices.

[Table 3 about here]

- (i) Works by Brueghel according to the auctions' catalogues (*By Brueghel = 1*) are, on average, over five times ($\exp(1.844) - 1 = 5.3$) more expensive than those that are not by him, both before and after 1999;
- (ii) The coefficient picked up by the *After Ertz = 1* variable is not significantly different from 0; this implies that the price trend of both types of works (autograph and not autograph) are not significantly different after 1999 (as they were before);
- (iii) Interaction term *By Brueghel = 1* \times *After Ertz = 1*: As expected the coefficient picked up by this variable (that is in and after 1999) is positive and significantly different from zero at probability level smaller than one percent. This is the *difference-in-differences* estimator for the Ertz effect. The implicit price of Ertz's expertise is equal to $\exp(0.465) - 1 = 59$ percent of the average price of a painting by Peter the Younger. Given that the

³⁵ See for example Ginsburgh et al. (2006c).

average price was equal to \$510,000 before Ertz, his expertise raised prices by some \$300,000, excluding all other possible effects that could also have increased prices;

- (iv) Other *Hedonic variables* of some importance: Height of the picture (+ 2 percent increase in the price per extra cm); presence of signature (+ 40 percent); described in the arts literature (+ 30 percent); tempera (much cheaper than oil, but there is only one tempera among the observations and this has little meaning); landscape (- 58 percent with respect to peasantries); religious scene (-28 percent with respect to peasantries); other subjects (- 57 percent with respect to peasantries); auction houses: the differences in prices across houses (with respect to Sotheby's London) are insignificant, with the exception of Bonham's and Dorotheum, and Other auction rooms which fetch much smaller prices than most other.

The analysis corroborates the assumption that a higher degree of certainty that the work is *by* the artist is reflected in a higher price and reveals the effective weight of expertise on the art market. It thus seems that a single notable expert is able to drive a niche segment by his own for a limited period of time, that is until new experts who may change attributions appear. Despite the fact that the *difference-in-differences* model considers average prices, results can be illustrated using the five concrete examples of resales of the same works before and after the publication of Ertz's *CR*.

[Table 4 about here]

Results globally follow those obtained in our regression; positive reattributions (d-d') and (e-e') (from non-autograph to autograph) generate a substantial price increase (8.9 and 15.3 percent per year), while negative reattributions (b-b') and (f-f') (from autograph to non-autograph) have negative consequences on value (-0.7 and -8.8 percent per year). For works included in the *CR* and whose attributions remain identical (a-a') and (c-c'), positive but weaker price variations can be observed, both for autograph and non-autograph pictures (2.2 and 1.7 percent per year).

4.2 Robustness checks

We ran two main robustness checks. The first is concerned with the point in time in which the Ertz effect could have taken place; the second examines whether the unique painting that carried a certificate delivered by Ertz before 1999 as being by Pieter the Younger could have contaminated our results. In both cases, we estimate the coefficients of equation (2).

The results of the estimation of (2) with three different points in time in which the Ertz effect could have taken place (1998, 1999 or 2000) are reported in Table 5. To have a

better representation of the discontinuity, we also ran regressions over the two shortened time periods 1972-2004 and 1972-2009—as we would have done if we had no further data—and for the whole period 1972-2015. As is obvious, the values of the *By Brueghel = 1* parameters are very close (between 1.77 and 1.86) but with standard errors of 0.13, which shows they are unlikely to be significantly different from each other. The values of the *After Ertz = 1* parameters in the different columns for years 1998, 1999 or 2000 decline when the number of years in the regressions goes from 1972-2004 to 1972-2015, which implies that the effect of the Ertz discontinuity gets more diffuse over time, though most of the coefficients are not significantly different from 0, and, therefore, do not tell much. The declining effect could also be the result of some overshooting during the first years in which the effect took place. The *By Brueghel = 1 × After Ertz = 1* coefficients are always larger in 1999 than in 1998 or 2000, though probably again, the differences are not significantly different from 0. Still 1999 is the year after Ertz curated exhibitions in which he mentions his *CR*, and the number of works sold in that year is almost twice as large as in 1998 and 2000 (15 against 8): 1999 is therefore likely to be the year in which the break took place, though the results are not very different if we had taken any other of the two neighboring years.

[Table 5 about here]

The results obtained by removing the unique sale that took place in December 1998, but had been certified by Ertz in 1993 as autograph and was mentioned in the sales catalogue, are reported in Table 6. As expected, the results of this robustness check are almost the same as those of our main regression in Table 3. The only noticeable change is the small (but not significant) increase of the coefficient picked up by the interaction term *By Brueghel = 1 × After Ertz = 1* from 0.465 to 0.470, which slightly reinforces Ertz's role.

[Table 6 about here]

5. Conclusions

“Time is the great judge” writes Haskell (1976, p. 4) while suggesting that historically high prices reveal the artist's status to the eye of the world. More than four centuries after his death, Pieter Brueghel the Younger passed the test of time and his rehabilitation materialized in the prices at which his works are traded. Since the late 1990s, the artist's market value has considerably grown after being subject to serious academic expertise: Ertz added some 60 percent to the value of works that he suggests as being *by Peter the Younger*

This case study supports the assumption that autograph works are a determinant issue on the market for Old Master Paintings. As informational goods, works of art need to be

assessed through a certification process that reduces uncertainty and information asymmetries.

But a *catalogue raisonné* is not necessarily sufficient, and it is worth noting that the Brueghel case cannot be generalized to other Old Masters. Similar tests were conducted for two other painters: Jan Brueghel the Elder and Joos de Momper the Younger, whose *catalogues raisonnés* by Klaus Ertz were published in 1979 and 1986, respectively. *Diff-in-diffs* estimation conducted in the same way failed to capture any significant difference in prices before and after the publication of the catalogue. Note that in both cases, the reputation of the artists was already established for quite some time.

For Peter the Younger, Ertz acted in a very wise and clever way by curating four exhibitions in different European cities one or two years before publishing his catalogue, but carefully spread the news that he was preparing it. The combined effect of both made it happen.

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Table 1. Description of the Data
(No. of observations--Characteristics)

	By Breughel	Other		By Breughel	Other
Total no. of works	430	249	(k) Landscape	10	1
Average price (\$1,000)	898.8	93.3	(k) Moralizing scene	106	88
Maximum price (\$1,000)	10091.4	1079.8	(k) Biblical scene	59	23
Minimum price (\$1,000)	8.4	1.7	(k) Other_subjects	4	3
(a) Height	51,39	51,98	(k) Peasantries*	251	134
(a) Width	73,45	72,92	(l) Christie's London	110	50
(b) Signed	228	21	(l) Christie's New York	45	11
(c) Dated	102	10	(l) Other Christie's	12	15
(d) Provenance	235	69	(l) Sotheby's London*	109	45
(e) Previous exhibitions	80	15	(l) Sotheby's New York	39	12
(f) Literature	172	42	(l) Other Sotheby's	6	13
(g) Certified	33	6	(l) Bonhams	2	7
(h) Scientific. investigated	10	4	(l) Dorotheum	12	14
(i) Canvas	31	42	(l) Drouot	15	24
(i) Copper	7	13	(l) Koller	9	5
(i) Other media	14	2	(l) Lempertz	4	1
(i) Panel*	378	192	(l) Philips	10	8
(j) Tempera	0	1	(l) Piasa	5	6
(j) Oil*	430	248	(l) Tajan	9	8
			(l) Other salesrooms	43	30

* indicates that the coefficient is set to 0 by normalization in the regressions.

** dimensions are not always given; circular or oval works are characterized by their diameter or the dimensions of their axes.

Table 2. Description of the Data
(No. of observations and prices--Years)

Year	By Brueghel		Other		Year	By Brueghel		Other	
	Number of works	Average price (\$1,000)	Number of works	Average price (\$1,000)		Number of works	Average price (\$1,000)	Number of works	Average price (\$1,000)
1972	3	594.4	2	10.5	1994	8	427.1	5	75.0
1973	10	653.5	1	26.7	1995	18	414.4	7	43.8
1974	13	284.6	7	82.4	1996	8	529.5	5	36.8
1975	3	293.2	4	85.1	1997	5	1436.5	5	56.3
1976	5	173.8	1	25.1	1998	8	474.3	11	70.2
1977	6	313.0	3	9.4	1999	15	1605.6	7	89.2
1978	10	409.8	4	58.5	2000	8	518.7	6	71.9
1979	7	547.5	-	-	2001	9	1510.8	13	87.8
1980	4	1008.7	4	247.8	2002	2	860.9	7	39.2
1981	13	449.8	5	36.4	2003	7	804.6	6	57.1
1982	9	254.5	1	73.7	2004	9	1751.2	10	77.4
1983	14	185.4	1	25.5	2005	12	1194.3	10	110.8
1984	9	419.6	3	22.8	2006	14	1955.2	5	58.2
1985	8	259.4	-	-	2007	15	814.3	10	102.0
1986	22	479.1	9	114.8	2008	9	1012.2	7	136.2
1987	8	396.9	6	18.1	2009	13	1626.1	2	126.0
1988	8	522.2	7	96.2	2010	11	1290.1	6	122.1
1989	12	958.2	12	113.7	2011	5	3281.3	7	171.9
1990	8	1494.7	9	74.0	2012	15	1643.2	10	46.4
1991	6	713.8	5	95.1	2013	14	1072.4	8	57.1
1992	5	427.2	5	317.2	2014	16	2120.7	4	59.7
1993	8	429.8	7	311.4	2015	18	649.0	2	160.8

Table 3. Main Regression Results

By Brueghel = 1	1.844*** (0.126)	Christie's London	-0.060 0.115
After Ertz = 1	0.137 (0.167)	Christie's New York	-0.195 (0.195)
By Brueghel = 1 × After Ertz = 1	0.465*** (0.153)	Other Christie's	-0.370 (0.279)
Hedonic variables		Sotheby's New York	-0.057 (0.178)
Height (cm)	0.019*** (0.004)	Other Sotheby's	-0.255 (0.212)
Width (cm)	-0.002 (0.003)	Bonhams	-0.923** (0.401)
Signed	0.374*** (0.103)	Dorotheum	-0.582** (0.207)
Dated	0.099 (0.122)	Drouot	-0.129 (0.187)
Povenance	0.062 (0.109)	Koller	-0.166 (0.288)
Exhibited	0.197 (0.131)	Lempertz	-0.595 (0.430)
Literature	0.233** (0.115)	Philips	0.046 (0.495)
Certified	-0.216 (0.186)	Piasa	-0.109 (0.147)
Scientifically investigated	0.212 (0.265)	Tajan	0.450* (0.267)
Canvas	0.245* (0.139)	Other auction rooms	-0.734*** (0.176)
Copper	0.240 (0.249)	Intercept	9.879*** (0.085)
Tempera	-0.726*** (0.153)	Annual dummies	yes
Other media	-0.046 (0.126)	R-squared	0.718
Landscape	-0.877** (0.349)	No. of observations	679
Moralizing genre scene	0.167** (0.069)		
Biblical scene	-0.326** (0.131)		
Other_subjects	-0.864** (0.418)		

Omitted variables: Works not by Breughel, Sotheby's London.

All variables are 1,0 (1 if the characteristic is present, 0 otherwise) except height and width.

Standard errors, clustered at the year level, are between brackets. *: significantly ≠ from 0 at $p < 0.10$;

** : significantly ≠ from 0 at $p < 0.05$; ***: significantly ≠ from 0 at $p < 0.01$.

Table 4. Sales and Resales

First sale			Second sale			Increase (%)	
Date	NA or A	Price (\$1,000)	Date	NA or A	Price (\$1,000)	Total	Annual rate
(a) 1979	A	1,294	(a') 2012	A	2,648	105	2.2
(b) 1984	A	237	(b') 2007	NA	204	-14	-0.7
(c) 1987	NA	33	(c') 2011	NA	49	47	1.7
(d) 1990	NA	97	(d') 2007	A	419	332	8.9
(e) 1993	NA	774	(e') 2011	A	10,091	1200	15.3
(f) 2000	A	624	(f') 2010	NA	249	-60	-8.8

Notes: NA or A mean 'non-autograph' or 'autograph' works

(a) Bruegel Pieter I ou Pieter Brueghel II, *Le Massacre des Innocents*, Ader Picard & Tajan (Paris), 28/03/979, lot 144

(a') Pieter Brueghel the Younger, *A Winter Landscape with the Massacre of the Innocents*, Christie's (London), Old Master and British Paintings, 03/07/2012, lot 45

(b) Pieter Brueghel the Younger, *Return from the Kermesse*, Sotheby's (New York), 07/06/1984, lot 39

(b') Workshop of Pieter Brueghel the Younger, *The Return from the Kermesse*, Christie's (NY), Old Master Paintings, 04/10/2007, lot 104

(c) Attributed to Pieter Brueghel the Younger, *A burgher handing an arrow to a lady*, Christie's (Amsterdam), 20/05/1987, lot 28

(c') Workshop of Pieter Brueghel the Younger, *A burgher handing an arrow to a lady*, Christie's (London), Old Master & British Paintings, 07/12/2011, lot 103

(d) Follower of Pieter Brueghel the Younger, *Procession of Peasants near village*, Sotheby's (London), Old Master Master Paintings, 04/07/990, lot 121

(d') Pieter Brueghel the Younger, *The Saint John's Dancers in Molenbeeck*, Christie's London, Important Old Pictures Including works from the Collection of Anton Philips, 06/12/2007, lot 26

(e) Attributed to Pieter Brueghel the Younger, *Combat between Carnival and Lent*, Christie's (Amsterdam), Old Master Pictures, 6/05/1993, lot 98

(e') Pieter Brueghel the Younger, *The Battle between Carnival and Lent*, Christie's (London), Old Master & British Paintings, 06/12/2011, lot 17

(f) Pieter Brueghel the Younger, *Battle Between Carnival and Lent*, Sotheby's (London), Important Old Master Paintings, Part I, 06/07/2000, lot 45 (no mention of Ertz)

(f') Workshop of Pieter Brueghel the Younger, *The Battle Between Carnival and Lent*, Sotheby's (London), Old Master and British Paintings Evening Sale, 07/07/2010, lot 7

Table 5. In Which Year Did the Break Happen?

	1972-2004			1972-2009			1972-2015		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
By Brueghel = 1	1.779*** (0.140)	1.765*** (0.130)	1.797*** (0.137)	1.816*** (0.131)	1.796*** (0.122)	1.817*** (0.123)	1.863*** (0.136)	1.844*** (0.126)	1.864*** (0.124)
After Ertz= 1	0.394* (0.224)	0.314 (0.207)	0.324 (0.224)	0.380* (0.213)	0.296 (0.203)	0.293 (0.211)	0.188 (0.177)	0.137 (0.167)	0.137 (0.163)
By Brueghel = 1 × After Ertz = 1	0.444* (0.247)	0.600** (0.222)	0.584** (0.252)	0.377* (0.186)	0.465*** (0.166)	0.461** (0.170)	0.405** (0.168)	0.465*** (0.153)	0.460*** (0.151)
Other hedonics	yes	yes	yes	yes	yes	yes	yes	yes	yes
Annual dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-square	0.657	0.657	0.656	0.686	0.686	0.685	0.718	0.718	0.717
No. of observations	466	466	466	563	563	563	679	679	679

Robust standard errors between brackets; *** p<0.01, ** p<0.05, * p<0.1

Table 6. Controlling for Ertz Certificates for Sales Before

1999

	All observations	Ignoring one observation
By Brueghel = 1	1.844*** (0.126)	1.839*** (0.128)
After Ertz= 1	0.137 (0.167)	0.141 (0.166)
By Brueghel = 1 × After Ertz = 1	0.465*** (0.153)	0.470*** (0.155)
Other hedonics	yes	yes
Annual dummies	yes	yes
R-square	0.718	0.719
No. of observations	679	678

Robust standard errors between brackets; *** p<0.01, ** p<0.05, * p<0.1

Figure 1. Prices for works by Pieter the Younger and Pieter the Elder 1700-1850

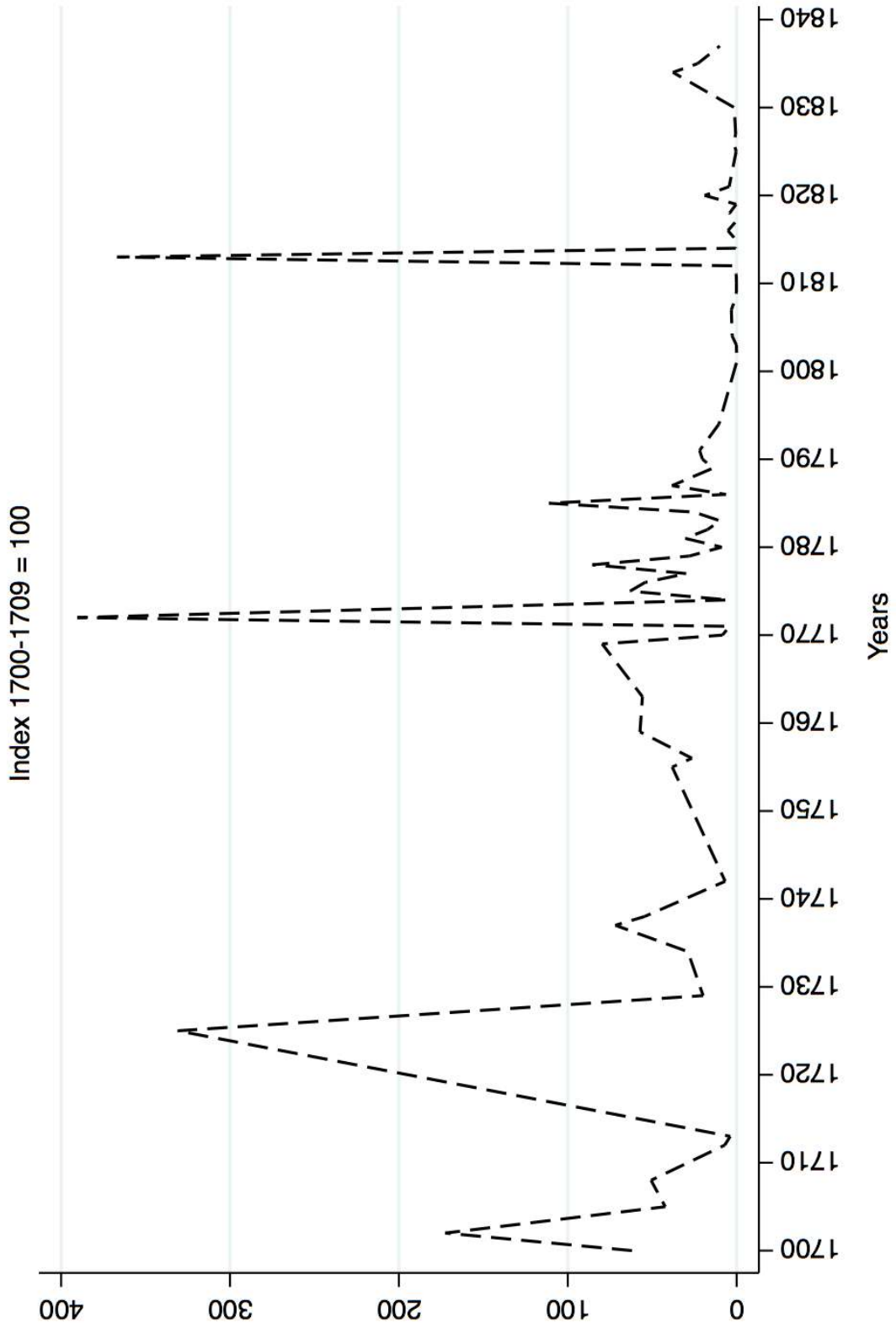


Figure 2. Five-year Prices Index
Autograph and Non-Autograph Works

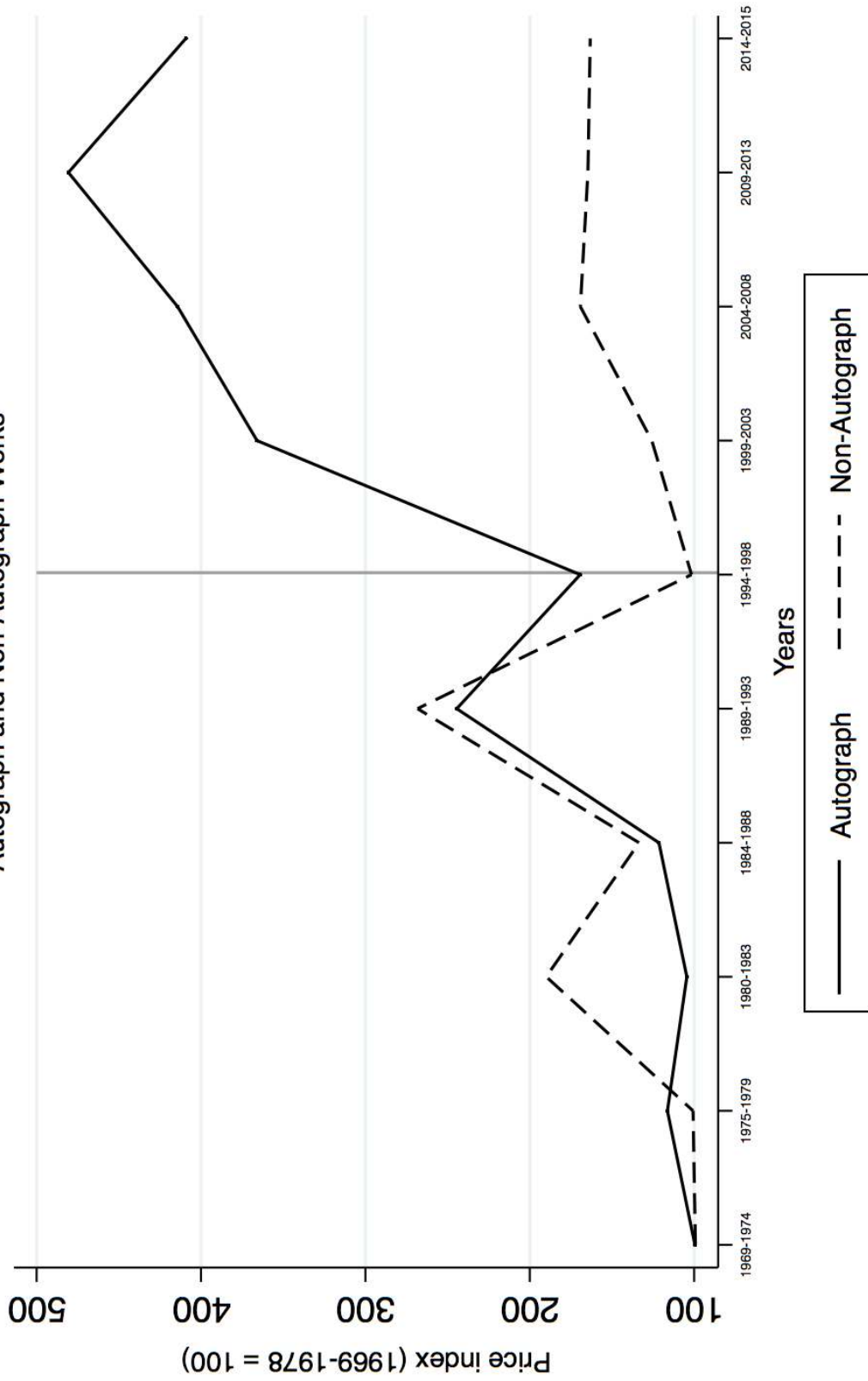


Figure 3. Distribution of Prices

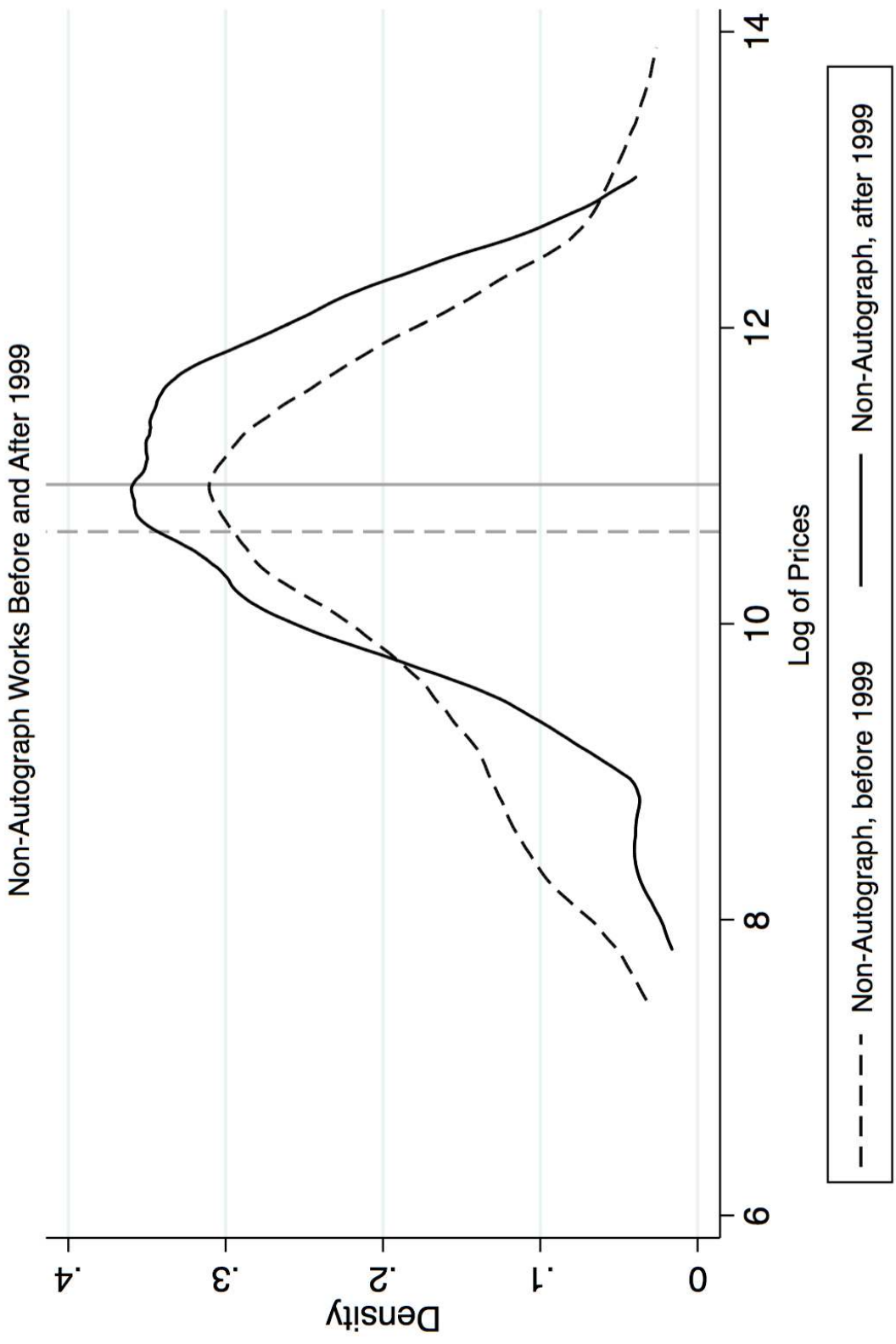


Figure 4. Distribution of Prices
Autograph Works Before and After 1999

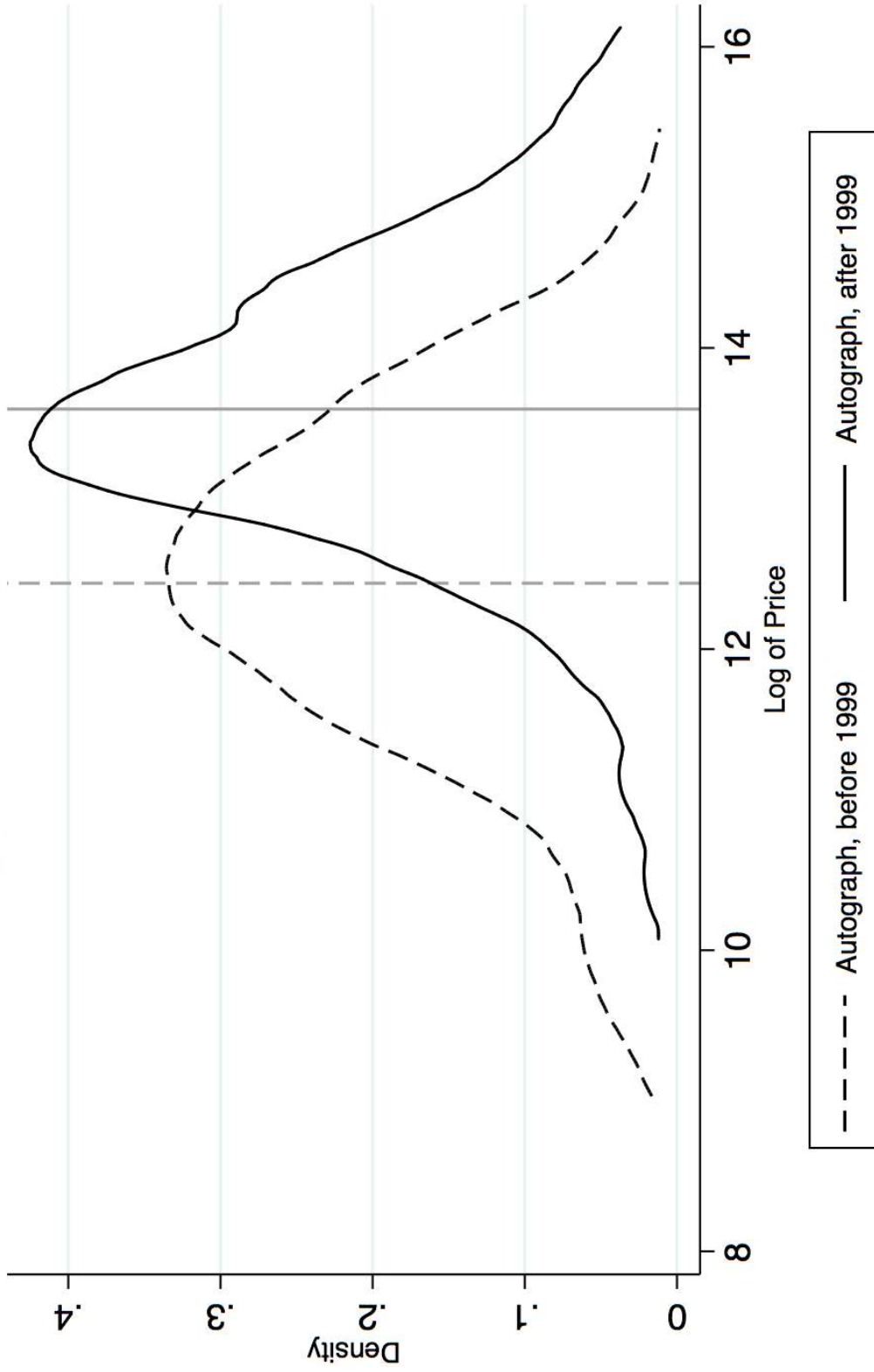


Figure 5. Annual Prices (in logs)
Autograph and Non-Autograph Works

