6. ART PRICE RESEARCH FOR FAKES AND IMITATIONS

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6.1. Introduction

One fine day in the mid-seventies, Edgar Mrugalla enters a gallery in Düsseldorf to offer a map with 80 drawings by Gulbransson. Today, Mrugalla is widely known as one of the two most famous contemporary German art forgers, but he was not uncovered until 1983. So the art dealer offers 3000 German marks for the drawings. Unfortunately, Mrugalla is accompanied by his 10-year old daughter, who immediately complains: "But Dad, you put such a lot of effort into these drawings".

"Ah, fakes", the art dealer says, "thus, I will pay you only half of the amount" (Ahrens and Handlögten, 1992: 41)

Mrugalla accepted. The forgers normally need the art dealers for two reasons. The psychological reason is that – as far as the dealers are fully aware of the fact that the paintings are fakes – they are the only people who are able to praise the forger's work and success adequately (Mrugalla, 1993: 156). The economic reason is that the dealers have certain functions in this market. They are inventing a provenance,[1] counterfeiting an expertise or bribing an expert to write one, they are giving the consumers the feeling that he, the art dealer, has a reputation to lose in case something was wrong, etc.

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[1] Not only fakes sell better with a well-documented provenance; see Müllerschön (1991: 191), for the case of a painting by Jules Dupré which more than doubled its value within 8 months due to the discovery of its provenance.

Thus, art forgers create only one part of the market value of fakes, and compared to prices obtained for originals at auctions, they certainly earn less.[2] But what about the prices at which fakes are offered by dealers to collectors? One reasonable null hypothesis is that fakes are as expensive as originals. However, it is not self-evident that this is really true. Prices for fakes might even be higher if the forgers choose motifs which are especially attractive from the point of view of today's buyers. On the other hand, prices would be lower if there is a shadow of doubt about the fakes. If fakes cannot be offered to real experts (e.g., museums), as the risk of detection is too high, this might also have a negative impact on prices.

However, the focus of this paper is on the structure, rather than on the absolute level, of prices. Section 6.2. sets out to provide some econometric evidence on the determinants of prices for both originals and fakes. E.g., does the reputation of the artist (or of who is presumed to be the artist) have a greater impact on the prices of fakes than on the prices of originals? Section 6.3. takes a brief look at prices of imitations (or "copies sold as copies", as opposed to "copies sold as originals", to use the terminology of Lazzaro, Moureau and Sagot-Duvauroux, 1999). Section 6.4. concludes.

6.2. Prices For Fakes: Some Econometric Evidence

6.2.1. Background and Data

The 1987/88 sample

From one of the few German police departments specialised in art and antiques, situated in Stuttgart (Ahrens and Handlögten, 1992, 180-183), a list of 139 offers of fakes was obtained, recorded by undercover agents. All offers were made by the same dealer, though the fakes were produced by different forgers. Most offers were made between November 1987 and November 1988; offers not within this period were so few and so much earlier (1982/83) that they had to be excluded from our sample in order to be able to control the timing of the offers adequately. Furthermore, many offers had to be excluded

[2] See also Mrugalla's type-written confession, which is reprinted in Ahrens and Handlögten (1992: 56-63). However, as far as prices are indicated in this confession, they often refer to convolutes of fakes and the size of the fakes is not given. Thus, these prices do not lend themselves to a meaningful statistical analysis.

as they were not complete with respect to size and/or price, leaving a total of 49 observations of fakes.

For all the 26 artists from this list, prices for their originals were also obtained. The 1988 and 1989 volumes of the *Kunstpreis-Jahrbuch* list 137 prices of these artists' oil paintings, obtained at auctions between July 1987 and June 1989. A listing of the artists in the sample is given in table 6.1.

Table 6.1. – Artists in the 1987/88 sample

	Fakes	Originals
Birkle	1	1
Bispham	1	0
Burnitz	1	1
Cezanne	1	8
Degas	1	2
de Koninck	1	1
Jawlensky	4	13
Kandinsky	1	6
Klee	1	2
Kokoschka	2	2
Liebermann	1	9
Manet	1	1
Monet	5	19
Parker	1	0
Ricasso	1	14
Rembrandt	2	0
Renoir	4	20
Rubens	3	2
Signac	1	8
Thoma	1	3
Tizian	4	3
Utrillo	1	12
Van der Helst	1	1
Van Dyck	1	5
Van Gogh	5	4
Zurbaran	3	0

The *Kunstpreis-Jahrbuch* – as any other art price yearbook – typically lists hammer prices in local currency. Thus, to obtain the dependent variable

PRICE, prices were converted into German marks and the buyer's premium and taxes which a German buyer would have to pay for the respective paintings were added.

Variables which can reasonably be presumed to have an impact on prices, and which can easily be measured, are SIZE (in cm²) and the artist's year of birth, BORN, the latter being a proxy variable for the painting's age or style.

It is equally obvious that the artist's repute should have an impact on prices, but how to measure this explanatory variable is less clear. Grampp (1989) mentions a kind of proxy variable, constructed by Willi Bongard, which increases with the number of works of the respective artist in selected art museums, and which is higher when the artist is mentioned in *Art Actual* and *Connaissance des Arts*. Grampp found that this index explained 25% of variance in prices (Grampp, 1989: 33). However, as the index was constructed in the 1970s for contemporary artists only, it is not suitable for our purposes. Anderson's (1974) measures for artist's repute is the artist's predicted price for 1900 and 1960, respectively. For our study, however, this would be close to defining, rather than measuring, the impact of the repute on current prices. The construction of our variable REPUTE avoids this problem in an easy but – as far as I know – novel way: by simply counting the number of columns devoted to each artist in the *Dictionary of Art* (1996).[3]

Finally, the offers of fakes are from November 1987 to November 1988, a time span during which art prices at auctions increased considerably (e.g., Candela and Scorcu, 1997; Ginsburgh and Jeanfils, 1995: 544). Thus, a variable WEEK taking the value 1 for the week from June 29th to July 5th, 1987, 2 for the following week etc. is constructed, expecting that, *ceteris paribus*, prices are higher the greater WEEK is. Table 6.2. summarises the data in the 1987/88 sample.

Table 6.2. – Descriptive Statistics: 1987/88 Sample Means

	Fakes	Originals	All
PRICE (German marks)	4,490,906	6,129,199	5,697,606
REPUTE	14	13	13
SIZE (cm^2)	5358	4174	4486
BORN	1767	1831	1814

[3] Alternatively, I also tried to measure repute by counting the lines in a less voluminous German art dictionary, the *Kunst-Brockhaus* (1983). The proxy variable thereby obtained turned out to be highly correlated with the above described measure for REPUTE (r = 0.91).

Note that though the artists in the subsamples of fakes and originals are identical, the averages of BORN and REPUTE differ due to the varying number of their works in the subsamples.

The 1995 sample

The police department which collected the data in the 1987/88 sample since then has built up a much larger archive of fakes in the market. However, the records currently serve the sole purpose of conducting investigations and are not suitable for being shown to outsiders. Nevertheless, the department was kind enough to provide me with photocopies of three different offers in a way that keeps details such as the parties concerned secret. Only one of the samples turned out to be suitable for the present purpose;[4] it contains data concerning 16 fakes of 11 artists listed in table 6.3.

Table 6.3. – Artists in the 1995 sample

	Fakes	Originals
Berchem	1	1
Cezanne	1	7
Chagall	1	19
Goya	1	2
Magritte	1	9
Pissarro	1	21
Rembrandt	1	1
Renoir	6	38
Rubens	1	2
Sisley	1	16
Van Dick	1	4

Variables are defined as for the 1987/88 sample, except that WEEK is not used because all fakes were offered at the same time in June 1995. Prices of originals obtained at auctions, one year before and one year after the offering of the fakes, were obtained from the 1995 and 1996 volumes of the

[4] One sample was unsuitable as it consisted of only a small number of drawings and prints, whereas another one was impressively large (44 fakes supposed to be painted by, e.g., Cigoli, Boucher and van Dyck), but without an indication of the paintings' size.

Kunstpreis-Jahrbuch. For descriptive statistics concerning the 1995 sample, see table 6.4.

Table 6.4. – Descriptive Statistics: 1995 Sample Means

	Fakes	Originals	All
PRICE (German marks)	2,814,603	1,357,940	1,529,312
REPUTE	15	10	11
SIZE (cm^2)	6812	3332	3742
BORN	1826	1780	1832

6.2.2. Results

The 1987/88 sample

To begin with, let us forget for the moment that some paintings in the sample are fakes. What we still could do with the data, following Anderson (1974), is to try to see which variables can "explain" the price. The following estimated model is the result of a simple OLS regression:

price=-
49920390+326507·REPUTE+410·SIZE+24998·BORN+72846·WEEK
(2.74) (4.00) (2.13) (2.60) (2.49)
$R^2 = 0.14$ 186 observations

This looks good insofar as all variables are significant (the numbers in parentheses are t-values). However, there are strong *a priori* arguments why this is not the best specification, which should briefly be considered before we try to detect the effect of fakes.

First, even if one was not familiar with the Weber-Fechner law (or if one does not believe that it applies to art), one would intuitively expect that price rises less than proportionally with size.[5] And whereas the above equation presupposes that the relationship between size and price is linear, this is not the case for the log-log curve, i.e., a linear relation between the log of the size and the log of the price. Hence in what follows, we take the natural logarithms of PRICE (LNPRICE) and SIZE (LNSIZE). Then if the regression coefficient is positive but smaller than 1, this indicates that price rises less than proportionally with size (Hamilton, 1991: 149).

[5] This is what the Weber-Fechner law generally asserts about the relation of sensation and stimulus (e.g., Stigler, 1950: 375-376).

And second, it is possible but by no means self-evident that for the artists in this sample the relationship between price and year of birth is monotonous; it might as well be ∪-shaped or ∩-shaped. A usual and convenient way to allow for such a possibility is to introduce another variable, BORN², on the right-hand side of the equation.

The outcome of regressing LNPRICE on the independent variables described so far is given in column 1 of table 6.5. The coefficients of all variables have the expected sign and they are significant at least at the 10%-level. However, such a regression is based on the assumption that the coefficients for fakes and originals are the same. Concerning the intercept, a straightforward test is to introduce a dummy variable taking the value 1 for fakes and 0 for originals. FAKE is clearly insignificant in column 2 of table 6.5. in other words, the prices of fakes and originals seem to be no different, *ceteris paribus*. This is a result which I do not wish to oversell, however. The prices of originals are from auctions and thus final, whereas the prices of fakes recorded by undercover agents might just have been intended to be a reasonable start of a negotiation process. If such negotiations had started, the price finally agreed upon might have been considerably lower.

Table 6.5. – 1987/88 regression results (dep. var.: LNPRICE)

	OLS	OLS	OLS	Median
LNSIZE	0.71047	0.71408	0.80782	0.96457
	(5.41)	(5.40)	(6.37)	(6.40)
REPUTE	0.08032	0.08043	0.07304	0.06633
	(6.85)	(6.84)	(6.46)	(5.00)
BORN	0.09160	0.09157	0.11834	0.14932
	(1.73)	(1.73)	(2.34)	(2.49)
$BORN^2$	-0.0000259	-0.0000258	-0.0000335	0.0000427
	(1.67)	(1.67)	(2.26)	(2.44)
WEEK	0.02637	0.02675	0.02065	0.02053
	(6.37)	(6.15)	(4.72)	(3.96)
FAKE		0.08724		
		(0.29)		
FAKE*LNSI			-0.29795	-0.37601
			(3.73)	(4.02)
FAKE*WEE			0.05783	0.06657
			(4.48)	(4.49)
CONSTANT	-75.1318	-75.3001	-98.9153	-125.3959
	(1.67)	(1.67)	(2.29)	(2.45)
	R^2= 0.45	R^2 = 0.45	R^2 = 0.50	Pseudo R^2 = 0.35

However, concerning the structure rather than the level of prices, our sample permits a more reliable answer. The structure of the prices of fakes and originals can be said to be different if the coefficients of any of the explanatory variables are different for the two subsamples. Thus, interaction variables FAKE*LNSIZE, FAKE*REPUTE, FAKE*BORN, FAKE*BORN² and FAKE*WEEK were included in the regression. However, FAKE*BORN, FAKE*BORN² and FAKE*REPUTE were clearly insignificant and thus not included in the final OLS regression equation given in column 3 of table 6.5. FAKE*LNSIZE is significant with a negative coefficient, meaning that for fakes the elasticity of the price with respect to size is lower than for originals. This is fairly plausible, at least if art dealers, like most people (according to, e.g., Arkes and Blumer, 1985), and unlike normative economics, do consider sunk cost as relevant for pricing. The point is that for fakes, the art dealer faces fixed (size-independent) costs which do not exist for originals, and which have already been mentioned in the introduction: extra costs for obtaining "expertises" if they are false, costs of inventing provenances, etc. This consideration also explains why, according to tables 6.2. and 6.4. above, fakes are, on average, so much larger than originals. (If a bundle of four small paintings had the same market value as two large paintings if all were originals, the art dealer would prefer the latter if all were fakes).

Unfortunately, no such economic explanation can be offered for the fact that, according to the regression, the impact of WEEK on price is significantly stronger for fakes (as the coefficient of FAKE*WEEK is positive). However, with respect to the variables BORN and REPUTE, we can say that the structure of the prices of fakes mirrors the structure of the prices of originals. Though this could be purely accidental, it is much more reasonable to conclude that the buyers of fakes are not entirely uninformed about the determinants of art prices, and that originals and fakes compete with each other up to a certain extent.

Whereas the regression equations reported so far are obtained by simple OLS, the final column of table 6.4. shows what happens when median regression is applied to the same set of variables. Median regression is a method to estimate the conditional median, rather than the mean, of the dependent variable. The main advantage of median regression, compared to OLS, is that the results are much less sensitive to y-outliers (e.g., Rousseeuw and Leroy, 1987). One would expect a sample of art prices to be full of outliers, and indeed, our sample happens to include *Yo Picasso* and Van Gogh's *Irises*, which were sold for no less than $ 47,850,000 and $ 53,900,000 at Sotheby's, New York. Nevertheless, the results reported in the final column

of *table 6.5.* are not very different from the previous OLS regression and demand no different interpretation.

The 1995 sample

This sample allows us to check the validity of the results for the 1987/88 sample, as most artists are different, and the dealer is not the same. Using 136 observations, LNPRICE is regressed on the same set of variables as before (see table 6.6), with the exception of WEEK, as already noted in section 6.2.1.

Table 6.6. – 1995 regression results (dep. var.: LNPRICE)

	OLS	OLS	OLS	Median
LNSIZE	0.63266	0.59849	0.68532	0.82256
	(7.89)	(7.65)	(8.41)	(4.97)
REPUTE	0.07129	0.07025	0.06974	0.06635
	(5.47)	(5.58)	(5.70)	(2.66)
BORN	0.09269	0.08706	0.09353	0.15926
	(2.15)	(2.09)	(2.30)	(2.00)
BORN²	-0.0000245	-0.0000227	-0.0000247	-0.0000437
	(1.98)	(1.90)	(2.12)	(1.91)
FAKE		0.72419	5.47370	7.33965
		(3.21)	(3.37)	(2.84)
FAKE*LNSIZE			-0.59130	-0.81439
			(2.95)	(2.63)
CONSTANT	-79.5536	-74.9749	-80.7526	-138.3934
	(2.11)	(2.06)	(2.28)	(1.99)
	R^2= 0.43	R^2 = 0.47	R^2 = 0.50	Pseudo R^2 = 0.31

Compared to the 1987/88 sample, the only important difference is that the coefficient of FAKE is positive and significant, i.e., the prices at which fakes are offered (which need not be final, however) are higher than the prices of originals at auctions[6]. Otherwise the conclusions drawn for the 1987/88

[6] Interpreting coefficients of dummy variables in semilogarithmic equations is a tricky business; simply multiplying it by 100 does not, as one might think, give the correct estimate of the effect of FAKE on price, the reason being that FAKE is not continuous. Applying the formula given in Kennedy (1981) to column 2 of table 6, it turns out that fakes are offered at prices 101% higher than auction results of originals, ceteris paribus. A similar interpretation of

sample are confirmed; the coefficients on LNSIZE, REPUTE, BORN and BORN² have the expected signs and are significant; interaction variables are not significant, again with the exception of FAKE*LNSIZE (the elasticity of price with respect to size is smaller for fakes).

Finally, in 1994-1996, the art market behaved less erratically than in the period covered by the 1987/88 sample and the 1995 sample includes less apparent outliers. Thus, for this sample it is no surprise that the final OLS regression, reported in column 3 of table 6.6., and the median regression do not lead to substantially different results.

6.3. Some Lessons from Imitations

In the 17th century, it was not uncommon for the great masters to produce copies of their paintings, or to let their assistants do it for them.[7] Later, original creators have left the market for copies (as far as oil paintings are concerned), but other suppliers have entered.

Konrad Kujau, a "jaunty and farcical figure" (Harris, 1986: 26) just like Mrugalla born 1938, in 1983 became famous as the forger of the Hitler diaries. He also extracted money from dubious nazi memorabilia collectors by counterfeiting, e.g., oil paintings by Hitler. However, he has a more general talent as a forger, and after being released from prison, he opened his "Gallery of Fakes" in Stuttgart about 12 years ago (Hamilton, 1991: 189). Until his death in 2000, the police permanently had an eye on him and enforced the condition that all the paintings in his gallery carried not only the signature of the artist whose work is more or less freely copied, but also his own. Data for a sample of 50 oil paintings was obtained in the gallery in September 1998. The sample comprises 35 imitations of 18 artists, and 15 originals in Kujau's own style. The average size is 3016 cm², the average price 3332 German marks. All paintings are sold with an individual frame, which accounts for about 10 to 30% of the price. According to Kujau, prices of his works are higher when sold by other gallerists.

Another sample of imitations is taken from the fall 1998 catalogue of the *Bilderwelt* gallery, Hamburg (formerly known as *Art-Store*). They have more than 1000 paintings on stock, of which the catalogue presents a selection of 165 pieces: 93 imitations – or, as they call it, "interpretations" – and 72

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the respective coefficients in columns 3 and 4 cannot be given, as FAKE here also enters an interaction variable.

[7] For Jan II Brueghel, the ratio of the original's to the copy's price ranged from about 2:1 to 4:1 according to De Marchi and Van Miegroet (1996: 55).

originals. Both imitations and originals are painted in oil mainly by Latin American artists without any kind of reputation. Here the paintings are, on average, almost three times as large as Kujau's (9028 cm²), but the average price is much lower: 1015 German marks without frames. We can really expect these prices to reflect average costs here. Thus if some artists were harder to imitate than others, this should be reflected in the structure of prices. For example, if a painter's repute increases with the difficulty of his painting technique, prices (or LNPRICE) should increase with REPUTE, measured as in section 6.2.2. above. If older masters were more difficult, and thus time-consuming, to imitate than, say, impressionists, BORN should have an impact on LNPRICE. However, this is not what we found. LNSIZE was the only significant variable, explaining 87% of the variance of LNPRICE according to the following simple OLS regression equation for the *Bilderwelt* sample:

$$\begin{aligned} \text{LNPRICE} &= 1.01 + 0.65\ \text{LNSIZE} \\ &\quad (5.67) \qquad (33.02) \\ R^2 &= 0.87 \end{aligned}$$

Individual artists' dummies also had no effect. Essentially the same is true for Kujau's imitations, though the R^2 is not that high:

$$\begin{aligned} \text{LNPRICE} &= 4.16 + 0.49\ \text{LNSIZE} \\ &\quad (6.32) \qquad (5.87) \\ R^2 &= 0.42 \end{aligned}$$

Interestingly, no significant difference between Kujau's originals and his imitations was found.

Now one main difference between originals and imitations is that the supply of the former is strictly limited, especially for dead artists. If demand increases with repute, price must increase. Demand for imitations probably also increases with the original artist's repute, but "production costs" appear to remain constant, and supply is more or less unlimited. It is true that Kujau's time was scarce, but reportedly he did not do all the painting himself and often just contributed his signature – which is perfectly legal in Germany and a convenient way for him to turn his reputation as a forger into money. Edgar Mrugalla, the forger mentioned in the introduction, now also runs a gallery for imitations or copies – sold as copies – in Büsum.

6.4. Final Remarks

It is a miracle that data on prices for fakes exist at all. Of course, they cannot be perfectly suitable for economists' purposes – not even as reliable as official statistics. Nevertheless, it is hoped that the econometric results presented above will be useful as pieces of evidence which inspire and facilitate some interesting discussions in art economics. To give an example, there is a famous remark on art prices by Renoir: "Get this into your head, no one really knows anything about it. There's only one indicator for telling the value of paintings, and that is the sale room." (quoted from Grampp, 1989: 15). If we accepted this without qualification, the conclusion of this paper would be that a copy sold as original, i.e., a fake, might have no lesser value than an original, and surely it has a much higher value than the very same copy sold as a copy. If this conclusion seems absurd, it should provoke future research from the law and economics or from the welfare economics branch.

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