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# **Stealing History: How does Provenance Affect the Price of Antiquities?**

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## **Abstract**

In 1982, the United States passed legislation that partially implemented the UNESCO Treaty, the Cultural Property Implementation Act. Despite the fact that the United States signed onto this treaty, it was common knowledge in the antiquities world that the enforcement of these laws has been lax, and the illegal sale of artifacts has continued. In December 2005, the Italian government took the Curator of Antiquities at the Getty Museum Marion True and Robert Hecht (a well-known antiquities dealer) to trial for conspiracy to buy and sell looted artifacts. This paper tests whether a good provenance increases the price of an antiquity and also whether the impact of appropriate provenance has changed since the trial began.

To test these hypotheses, a hedonic regression on sales prices of provenanced and unprovenanced artifacts is estimated. We find that provenanced items are indeed selling for higher prices after 2005, *ceteris paribus*, which is evidence that the art market has responded to the law suits.

**JEL Classification Codes:** Z11 C29

**Keywords:** Hedonics, market for antiquities, provenance, difference-in-difference

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## INTRODUCTION

For centuries, looting, specifically of antiquities, has been an uncontrolled problem for civilization. When artifacts are looted rather than excavated by archaeologists, several issues arise. Most notably, we lose all perspective and context of the artifact and its people. Since not many direct sources exist from ancient times, we rely on the archaeological excavation of ancient sites in order to gain an understanding of their society. Artifacts are the puzzle pieces, and based on surrounding objects found in excavation sites, archaeologists can infer generalizations about the artifact's purpose to discover more about life in antiquity. However, when sites are looted all of the information that could have been extracted is lost forever. Often times, the looter does not think that selling the objects will be profitable and the unmarketable artifacts are tossed aside without care and can be broken or destroyed.

In an effort to try to prevent looting, Greece passed a law in 1833 stating that any artifacts found on Greek soil, even on private property, are property of Greece and therefore cannot be exported out of the country. Italy and Egypt (1939 and 1983 respectively) passed similar Stolen Property Acts that prohibited the looting and exportation of artifacts. Unfortunately, these laws were not enough to prevent the illegal excavation and sale of artifacts. Thus, in 1970 the UNESCO Treaty was drafted, which stated that as long as artifacts are legitimately documented or published prior to 1970, sale and purchase of the artifact is legal. Various countries signed onto the treaty at different times (the United States did so rather early) and then drafted their own specific laws to enforce the treaty. In 1982, the United States passed legislation that partially implemented the UNESCO Treaty, the Cultural Property Implementation Act (CPIA). One section states that other countries can make a request to enter into a bilateral agreement with the

United States to restrict the trade of illicit antiquities. This would then give United States Customs the right to seize artifacts that are suspected of being stolen.

Despite the fact that the United States signed onto this treaty, it was common knowledge in the antiquities world that the enforcement of these laws has been lax, and the illegal sale of artifacts has continued. In December of 2005, the Italian government took the Curator of Antiquities at the Getty Museum Marion True and Robert Hecht (a well-known antiquities dealer) to trial for conspiracy to buy and sell looted artifacts. This marked the first time a curator has been prosecuted for stolen art and sent shock waves throughout the antiquities world. Up until 2005, only museums have been prosecuted for purchasing antiquities without provenance.<sup>1</sup> Never before has a curator been singled out like this. In October 2010, the charges against Marion True were dropped due to the statute of limitations, but in the mean time she has lost her job at the Getty and her reputation has been tarnished.

Due to the laws and changes in the strength of enforcement, it has been speculated that post 2005, the hammer price of legitimately provenanced antiquities has sky rocketed at auctions.<sup>2</sup> In a New York Times article in 2007, the director of the Museum of Fine Arts in Houston was cited as saying “Provenance is what is driving prices up.... Provenance is having enormous value.” This paper will test whether a good provenance increases the price of an item and also whether the impact of appropriate provenance has changed since the trial began. To test these hypotheses, a hedonic regression on sales prices of provenanced and unprovenanced artifacts will be estimated. If provenanced items are indeed selling for higher prices after 2005, *ceteris paribus*, then this would be evidence that the art market has responded to the law suits.

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<sup>1</sup> Provenance refers to the modern history of the item, not its archeological provenance (see Norskov, page 27).

<sup>2</sup> Hammer price refers to the final sales price of the object.

Also, since it was the Italian and Greek governments that prosecuted Marion True, we can test whether the sales prices of antiquities from those countries have been affected differently than that of other countries. We can also test whether the estimates provided by the auction house adjusted for these changes in the value of provenance. The results from our regressions will allow us to examine whether the Marion True trial has sent a signal to the antiquities world that the UNESCO Treaty will now be enforced.

#### LITERATURE REVIEW:

There are only a few papers in the economics literature that consider the impact of provenance. Massey (2008) does not use statistical analysis, but discusses the legal and illegal aspects of the antiquities market and finds that the looting of antiquities is an international phenomenon, and therefore the cultural understanding of the legality of a situation regarding antiquities changes geographically. In addition, he claims that it is difficult to analyze information because society's perspective of acceptable provenance is constantly changing.

Levine (2009) provides a background of the legal issues involved. She points out that the recent legal cases have begun to convince buyers that "sketchily documented archaeological objects sold today carry a risk" (page 2). Thus an item with "[f]ull provenance commands better market value" (page 3). However, she does not provide statistical evidence of these claims.

Another paper that considers provenance is by Norskov (2001). While regression analysis was not used, this study exclusively focused on ancient Greek vases from a number of different auction houses (70% from Christie's and Sotheby's). He explains that the number of Greek vases for sale per catalog increased from the 1950s through the 1980s and then started to level off, which probably means that many of these vases were illegally excavated. However,

he concludes that the percentage of vases at auctions with legitimate provenance is increasing and that museums are actively changing their acquisition policies. He concluded that these changes will impact price stating “a high price for an object seems today to be dependent on a documented history” (page 35). However, he provides no statistical verification of this fact.

In order to test whether provenance impacts price, and whether that impact has changed over time, we will utilize hedonic regressions. This approach was developed by Rosen (1974) and has been utilized in many fields including environmental economics (see e.g. Boyle and Kiel (2001)). The underlying theory is that the characteristics of a good contribute to the price of the good. By controlling for the characteristics in a regression framework, the marginal contribution of the characteristics to the price is the estimated coefficient.

The hedonic technique has also been used in the economics of the arts literature to value the characteristics of art works and to create price indexes of art. One of the first studies to do so was by Anderson (1974) and many others have followed. Ashenfelter and Graddy (2006) provide a list of earlier papers that have looked at paintings, antique furniture and Stradivari violins using this approach. In their paper, Rennebood and Spaenjers (2009) conduct a very extensive hedonic regression analysis of the sale of over one million artworks over the past 50 years to determine a price index and returns of artwork as an investment. Since their paper focused on the art market in general, rather than just the antiques market, many of the variables that they included were not relevant for this study. The authors point out one of the difficulties with using the hedonic approach is choosing the characteristics to include.

In studying art works, researchers generally rely on data from auctions. In their paper Ashenfelter and Graddy (2003) explain how auction houses value art and set reserve prices.

They explain that there are two components to the price of artwork, a fixed component reflecting unique and fixed characteristics of the piece, and a variable term that is an index of how the art market is moving, therefore concluding that the price of artwork does not necessarily accurately represent its value. In addition, they concluded that the high and low estimates that the auction houses provide in their presale catalogs are truthful and accurate since the estimates and hammer prices are highly correlated.

#### MODEL:

In order to test for the impact of provenance on prices, we develop a hedonic equation to predict the hammer price of an antiquity at auction. To reflect the price of antiquities, we include a variety of characteristics that could contribute to an item's value and then include variables on the item's provenance and date of sale. The general model is based on the difference-in-difference approach (see Wooldridge, pages 450-461).

$$\begin{aligned} \text{Ln(Hammer Price)} = & \beta_0 + \beta_1 \text{ dCountry of Origin} + \beta_2 \text{ dClass of Object} + \beta_3 \text{ Age of} \\ & \text{Object} + \beta_4 \text{ dAttributed Artist} + \beta_5 \text{ dPrivate Collection} + \beta_6 \text{ dBiggestDimension} + \\ & \beta_7 \text{ dPreviously Auctioned} + \beta_8 \text{ dProvenance} + \beta_9 \text{ dTrialPeriod} + \beta_{10} \text{ dPostOct2010} \\ & + \beta_{11} \text{ dProvenance*dTrialPeriod} + \beta_{12} \text{ dProvenance*dPostOct2010} + u \end{aligned}$$

We have chosen to take the natural log of all of the variables that are concerned with price, because it is likely that prices do not increase linearly. The rest of the variables, most of which are dummy variables, are used to capture the characteristics and components of antiquities to accurately estimate a hedonic price for the item.



## DATA:

The data are taken from Sotheby's semi-annual antiquities auctions.<sup>3</sup> Data from Sotheby's Antiquities catalog from 2001 (December), 2005 (June), 2008 (December) and 2010 (June and December), were entered and the hammer prices were taken from their website. For each lot, the following information was collected: date of auction, number of objects in the lot, country of origin, date of origin, class of object, provenance, pottery shape, fragment, attributed artist, biggest dimension, private collection, previously auctioned, if it had been exhibited, if it had been published, lower estimate, upper estimate and hammer price (see Table 1 for variable definitions and Table 2 for descriptive statistics). Since the data were from the presale catalogs, it was limited to what characteristics were printed. All prices were recorded in dollars, which were then adjusted for inflation using the Consumer Price Index (base year 1982-84). If the date of origin was recorded as a range, the mean date was entered.

Most of the continuous variables are self-explanatory. There are several dummy variables included. Most importantly Provenance was defined as pre-1970 (the UNESCO Treaty requirement). Country of origin is specified as Greek, Roman, Egyptian, and other. The type of object is divided into very simplified categories: pottery, sculpture, and other. While there are many different kinds of Greek pottery, the classification is limited to not pottery, cup/dish and storage jar/jug. There are binary variables for the trial period, after the case was dropped, if the piece was a fragment, if it previously belonged to a private collection, if there is an attributed artist from antiquity and if it had previously been auctioned. We also included the largest single dimension of the object.

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<sup>3</sup> Data from Christie's auctions could not be included because they do not publically release the hammer prices from their auctions.

We have included dummy variables for the year in which the auction took place, in order to control for changes in the economy which might impact buyers' demand for antiquities. Due to high multicollinearity, we could only include variables for 2005 and 2008.

The TrialPeriod variable indicates that the auction occurred after the Marion True case, but can also correct for possible appreciation in the value of antiquities. The post-Oct2010 variable indicates that the auction took place in December 2010, after the case against True had been dropped. The remainder of the binary variables control for factors that, for the most part, would contribute to the value of artwork.

Some of the variables are correlated with each other. The pairs of variables (other than the time variables) with a correlation coefficient over 0.5 are greek and not pot (-0.52), pottery and not pot (-0.82), pottery and attributed artist (0.52), cup and not pot (-0.61), not pot and attributed artist (-0.58).<sup>4</sup>

Sometimes at auctions, a lot does not reach its reserve price (the minimum price that the seller is willing to sell their object, which is unknown to the bidders) and therefore it does not sell which means there is not a hammer price. Of the 628 observations collected, only 512 of them sold, and 510 had all the available characteristics.

## RESULTS:

Prior to estimating the regressions, we look at the mean of the sales price in different categories (see Table 3). The price over the entire sample when the item has 'good' provenance is \$314,765.30 and is \$44,654.95 when the item does not have good provenance. This suggests that provenance does impact price, but does not control for changes in the items being sold or for

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<sup>4</sup> Correlation matrix available from authors upon request.

changes in the market. To examine the impact of the trial on the mean sales price, notice that items with good provenance before the trial began sold for an average of \$28,746.64 and after the trial started sold for \$441,884.60. Items without good provenance sold for an average of \$28,075.89 before the trial and for an average of \$67,145.94 after the trial started. This suggests that the market for antiquities was seeing an increase in demand (and thus price) over the time period, a fact which will be controlled for in the regression analysis.

After looking at scatter plots of the dependent variable, hammer price, and the lower estimates from the auction house, we concluded that the correct functional form for them would be logarithmic. All the other continuous variables, except age squared, fit with linear form. All of the following regressions are estimated using Ordinary Least Squares (with robust standard errors) and are run using the natural log of hammer price as the dependent variable.

First we run a very basic regression to test if provenance affects the hammer price of antiquities. We generated interaction terms between the dummy variable for good provenance and the period of the trial and between provenance and post-Dec2010 (see column 1 in Table 4). The results are generally as expected. Greek, Roman, and Egyptian pieces sell for higher prices than do pieces from other countries. The age of the piece first increases the price but then decreases it. Pottery sells for lower prices and sculpture for higher prices relative to other categories such as mosaics and jewelry, and items that come from a private collection also sell for higher prices. Items that sold after 2005 and before December 2010 generally had lower prices, while those that sold in the December 2010 auction went for higher amounts.

Provenance, in itself, does not have an impact on price. However, for items that sold during the trial period (which sold for 68.8% less *ceteris paribus*), provenance increased the price by 71.5%. Items sold in December 2010 received a premium of 71.8% if they had better

provenance. These results suggest that the True case did have an impact on prices, and that the termination of the case did not change the impact of provenance.

In our second regression, we included terms to test whether the country of origin had a differential impact on provenance during the trial period. We interact the Greek and Roman variables with the provenance variable, and also with the trial period variable. The results suggest that country of origin did not matter, which leads us to believe that buyers felt all countries were becoming more likely to enforce their laws, not just the Italians and Greeks.

In our third and fourth regressions we add the log of the real lower estimate of the hammer price, as provided by the auction house. This is a test of whether the appraisers correctly anticipated the impact of provenance over this time period. Including this variable does increase the  $R^2$ , and the coefficients on provenance interacted with the trial dates become statistically insignificant, along with several of the other explanatory variables. These results suggest that appraisers were accurate in their assessment of the value of provenance, although they did not appear to anticipate the fall in demand in the 2008 auctions.

#### CONCLUSION:

The antiquities market and its code of ethical conduct are definitely evolving, so it is difficult to make definitive conclusions. It was believed that post-2005, artifacts with provenance before 1970 exhibited soaring hammer prices; our results confirm this belief. In addition, the importance of provenance does not fall once the True trial is ended, which suggests that the concern for legal ramifications continues. The uncertainty in the market caused by the trial is what has led buyers to shy away from pieces without impeccable provenance. If countries

want to discourage the sale and purchase of illegal items, it appears that continuing these stronger legal tactics will be required.

Table 1– Variable definitions

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VARIABLES

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Greek	=1 if object has Greek origin, =0 otherwise
Roman	=1 if object has Roman origin, =0 otherwise
Egyptian	=1 if object has Egyptian origin, =0 otherwise
Age	Age of object
Pottery	=1 if object is pottery, =0 otherwise
Sculpture	=1 if object is sculpture, =0 otherwise
Provenance	=1 if object was documented prior to 1970, =0 otherwise
Notpot	=1 if object is not pottery, =0 otherwise
Cup	=1 if object is a cup, =0 otherwise
Frag	=1 if object is a fragment, =0 otherwise
attrib_artist	=1 if object is attributed to an artist, =0 otherwise
priv_coll	=1 if object is from a private collection, =0 otherwise
prev_auc	=1 if object was previously auctioned, =0 otherwise
Biggestdimension	Object's largest dimension, in inches
dec10	=1 if object auctioned in December 2010, =0 otherwise
Lnhamprice	Log of real hammer price
provpost10	Provenance*Dec10
lrlwr_est	Log of real lower estimate
Trialperiod	=1 if item sold in December 2008 or June 2010, =0 otherwise
Provtrial	Provenance*trialperiod
year01	=1 if object sold in 2001, =0 otherwise
year05	=1 if object sold in 2005, =0 otherwise
year08	=1 if object sold in 2008, =0 otherwise
year10	=1 if object sold in 2010, =0 otherwise
Greekprov	Greek*provenance
Romanprov	Roman*provenance
Greekprovtrial	Greek*provenance*trialperiod
Romanprovtrial	Roman*provenance*trialperiod

Table 2 Descriptive Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Greek	510	0.208	0.406	0	1
Roman	510	0.229	0.421	0	1
Egyptian	510	0.290	0.454	0	1
Age	510	2,838	1,502	1,461	26,011
Pottery	510	0.112	0.316	0	1
Sculpture	510	0.498	0.500	0	1
Provenance	510	0.406	0.492	0	1
Notpot	510	0.888	0.315	0	1
Cup	510	0.0451	0.208	0	1
Frag	510	0.0882	0.284	0	1
attrib_artist	510	0.0451	0.208	0	1
priv_coll	510	0.637	0.485	0	2
prev_auc	510	0.153	0.360	0	1
Exhib	510	0.0667	0.250	0	1
Biggestdimension	510	12.64	12.21	0.400	83.25
dec10	510	0.202	0.402	0	1
Lnhamprice	510	4.656	1.482	1.218	11.60
provpost05	510	0.282	0.451	0	1
provpost10	510	0.102	0.303	0	1
lrlwr_est	510	4.044	1.236	1.012	9.124
Trialperiod	510	0.331	0.471	0	1
Provtrial	510	0.180	0.385	0	1
year01	510	0.245	0.431	0	1
year05	510	0.222	0.416	0	1
year08	510	0.192	0.394	0	1
year10	510	0.341	0.475	0	1
Greekprov	510	0.0451	0.208	0	1
Romanprov	510	0.100	0.300	0	1
Greekprovtrial	510	0.0235	0.152	0	1
Romanprovtrial	510	0.0451	0.208	0	1

Table 3

Sales Price	Before Trial	After Trial Began
With Provenance	28,746.64 (44,543.98)	441,884.60 (2,160,814)
Without Provenance	28,075.89 (43,601.80)	67,145.94 (150,851.40)



Table 4 - Regression Results

VARIABLES	(1) lnhamprice	(2) lnhamprice	(3) lnhamprice	(4) lnhamprice
Greek	0.959*** (0.182)	1.005*** (0.194)	0.0681 (0.0951)	0.0723 (0.0917)
Roman	0.857*** (0.187)	0.748*** (0.196)	0.00348 (0.0927)	0.0227 (0.0982)
Egyptian	0.367** (0.159)	0.380** (0.163)	0.199** (0.0853)	0.198** (0.0884)
Age	0.000227*** (8.63e-05)	0.000225** (8.80e-05)	0.000103*** (3.80e-05)	0.000102*** (3.75e-05)
Agesq	-5.98e-09* (3.04e-09)	-5.90e-09* (3.12e-09)	-4.40e-09*** (1.34e-09)	-4.34e-09*** (1.32e-09)
Pottery	-0.500** (0.219)	-0.519** (0.219)	0.0381 (0.124)	0.0414 (0.125)
Sculpture	0.805*** (0.132)	0.789*** (0.132)	-0.0413 (0.0705)	-0.0396 (0.0704)
Notpot	0.162 (0.266)	0.163 (0.265)	0.0531 (0.142)	0.0601 (0.141)
Cup	0.188 (0.249)	0.223 (0.244)	0.215 (0.134)	0.238* (0.134)
Frag	-0.384* (0.211)	-0.414** (0.207)	-0.168 (0.111)	-0.173 (0.109)
attrib_artist	0.564** (0.284)	0.627** (0.293)	-0.0277 (0.140)	-0.0245 (0.148)
priv_coll	0.371*** (0.113)	0.357*** (0.116)	0.0905 (0.0578)	0.0802 (0.0577)
prev_auc	0.249 (0.161)	0.227 (0.160)	0.160* (0.0853)	0.154* (0.0864)
Biggestdimension	0.0399*** (0.00528)	0.0396*** (0.00558)	0.000976 (0.00260)	0.000701 (0.00271)
year05	-0.376** (0.150)	-0.388** (0.152)	-0.117 (0.0872)	-0.122 (0.0876)
year08	0.155 (0.217)	0.130 (0.207)	-0.283*** (0.0977)	-0.326*** (0.0946)
Provenance	-0.0373 (0.176)	-0.0682 (0.196)	0.00833 (0.106)	0.0152 (0.121)
Trialperiod	-0.688*** (0.201)	-0.653*** (0.199)	0.0938 (0.0996)	0.116 (0.0985)
dec10	0.451** (0.224)	0.476** (0.226)	-0.0169 (0.116)	-0.0137 (0.116)
Prov*trial	0.715*** (0.262)	0.760** (0.301)	0.120 (0.138)	0.154 (0.153)

Prov*post10	0.718** (0.351)	0.638* (0.372)	0.290 (0.183)	0.277 (0.190)
Greek*prov		-0.545 (0.500)		-0.210 (0.266)
Roman*prov		0.544 (0.390)		0.0953 (0.197)
Greek*prov*trial		0.550 (0.579)		0.369 (0.311)
Roman*prov*trial		-0.597 (0.559)		-0.317 (0.252)
lrlwr_est			1.077*** (0.0327)	1.075*** (0.0327)
Constant	2.305*** (0.407)	2.334*** (0.412)	-0.143 (0.220)	-0.133 (0.216)
Observations	510	510	510	510
R-squared	0.348	0.355	0.833	0.834

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Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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