

Explaining the Market Price of the ‘Tribute Penny’: Evidence from 132 Auctions

By John G. Matsusaka

Ancient coins are notoriously difficult to price. Unlike modern coins, where value closely follows grade, the price of an ancient coin depends on numerous factors in addition to grade, such as style, strike, and patination. The multiplicity of factors can make it difficult for a dealer to decide what to charge and for a buyer to decide what to pay. Some information is available in catalogs such as David Sear’s *Roman Coins and Their Values* (RCV), but only for grade. Hard estimates on how much that nice toning is worth, or how much that edge ding cuts the value is nowhere to be found.

This article provides some estimates of what determined the price of a particular coin, the “tribute penny” of Tiberius (RIC I, nos. 26, 28, 30), based on 132 auctions in 1995-1996. With so many auctions, it is possible to determine the actual effect of grade on price, as well as the effect of style, conditions of manufacture, and conditions of preservation. I chose to focus on this particular coin because of its popularity among collectors, and because of the large number of auctions available for study.

Prices and other information were taken from Morten Mortensen’s *Roman Coin Price Yearbook, 1996/1997*. The *Yearbook* lists the hammer prices from over 200 public auctions held worldwide in 1995 and 1996. These are the “higher end” firms, such as CNG and Harlan Berk in the United States and Elsen and Lanz in Europe, not the midrange and lower-end firms that have proliferated on the internet. I arrived at the final price by adding the buyer’s premium to the hammer price, converting the auction currency to U.S. dollars based on the exchange rate prevailing on the day of the auction, and then adjusting for inflation to state everything in January 2003 dollars. I then used a standard statistical procedure to disentangle how a number of factors contributed to the final price. The final prices ranged from a low of \$96 for a VF/F to a high of \$1,304 for an EF. Statistical details are listed at the end for those readers (if any) who are interested.

The estimates are reported in Table 1. The top half of the table shows the average price for a coin of a given grade that does not have any of the positives or negatives listed in the bottom half of the table. The bottom half shows how the price changed when a given defect or merit was present (as reported in the catalog description). The numbers are best estimates from the data but should be understood as averages subject to some measurement error. Of course, the price of a coin depends on more than the factors listed in the table, including a number of idiosyncratic factors such as the mood of the bidders, but it turns out that 89 percent of the variation in prices can be explained by these factors alone. Put a different way, only 11 percent of the price variation is not accounted for by the short list of factors in the table.

Grade Matters

The average price of a tribute penny without defects or outstanding merits was \$634 in EF, \$285 in VF, and \$180 in F (remember these are 2003 dollars and include the buyer's premium). There was an increasing premium for quality: a VF sold for 58% more than an F, while an EF sold for 225% percent more than a VF. I tried distinguishing the price by finer gradations (like "almost VF") and by obverse/reverse pairs (like "F/EF") but there were either too few cases in the sample or the differences did not seem to matter.

One issue that can be addressed with these numbers is the accuracy of the market valuations given in references such as RCV. If we convert the estimates back to year 2000 dollars (the year of the Sear valuations), the average prices are \$600 for EF and \$269 for VF. The RCV valuations are remarkably close, \$600 and \$285, respectively. I have heard the RCV valuations criticized both for being too high and too low, but they are right on for this coin. The actual prices also fit within the ranges given by another of my favorites, David Vagi's *Coinage and History of the Roman Empire*.

Defects

How do defects affect the price? To answer this, it is useful to distinguish between two types of defect. The first type arises in the manufacturing process. The most common such defect (for these particular auctions) was an offcenter strike. Other problems are irregular flan shapes, worn dies, and flat strikes, none of which seem to plague the tribute penny. Table 1 shows that manufacturing defects had a big effect, reducing the price by \$135 on average.

The second type of defect pertains to preservation. The most common problems were porosity and scratches. Preservation defects had only a modest effect on the prices in these auctions: on average such a defect cut the price by only \$33. But even this is a bit misleading since the effect is not “statistically significant,” meaning there is enough error in the estimate to allow for the possibility that the effect is zero. I was somewhat surprised to see that the market punished manufacturing defects much more than preservation defects.

Merits

How do exceptional merits impact the price? As with defects, merits can arise in the production and preservation process. The most common production merit noted by the catalogers was “good style,” invariably referring to the obverse. Good style is estimated to have added a mere \$28 to the final price, and this effect is statistically insignificant. To my eye, the portrait and reverse of this coin are rather banal even when skillfully executed, which could account for the minor importance of style on the price. Style might be more important on a Nero sestertius, for example.

The most commonly noted preservation merit was toning. Toning turns out to have added \$34 to the price, an amount that is again statistically insignificant. Buyers were not willing to pay much of a premium on average for toning.

Europe versus United States

The last factor considered in Table 1 is the location of the auction. It is often claimed that European grading standards are more conservative than American standards. If that is true, then a coin graded VF in Europe is better than one graded VF in the United States. One way to assess whether this is true is to compare the prices holding constant the grade: European-graded coins should sell at a premium over American graded coins, holding constant the grade. The last entry of Table 1 shows that European coins did sell at a \$28 premium on average, but the effect is statistically insignificant. If we consider that the difference between a VF and EF coin is almost \$200 dollars on average, the European premium is only about 1/8th of a grade. At least for these auctions, the idea of more conservative European grading seems mostly folklore.

Prices are Predictable

Up close the ancient coin market can seem chaotic and unpredictable. And indeed, most of us have seen of plenty of cases where a particular coin went for far more or less than it would on a normal day. Yet an examination of these 132 tribute penny auctions reveals a surprising amount of predictability. Nearly 90 percent of the variation in final prices can be accounted for by just the handful of factors in Table 1. In fact, you can do just as well knowing only the grade and whether a coin has a production defect.

Finally, a few disclaimers. First, this evidence is only for a particular type of coin in a particular two year period. There is no reason to think the results are unique to this coin and time, but we should be careful about generalizing. For example, I would not be surprised if the effects of defects and merits were different for bronze coins. Nicks may not be penalized so heavily and patination may be more important for sestertii. The other issue is how the internet has affected pricing. The auctions in the *Yearbook* were essentially pre-internet. While it seems clear that the internet has revolutionized the market for certain types of coins, such as later Roman bronzes, it is unclear what it has done to the structure of pricing for midrange and high end coins.

Note on Statistical Procedure

The estimates are taken from a multivariate regression of final price on the control variables listed in Table 1. I used ordinary least squares to fit the coefficients. All of the explanatory variables were dummy variables equal to 1 if the indicated condition held (for example, the “Good Style” dummy was equal to 1 if good style was noted, and zero otherwise). I employed a 10 percent cutoff for statistical significance, although the insignificant results never even approached this level. The actual regression is posted on my web site: www-rcf.usc.edu/~matsusak. I deleted two outlying observations with final prices of \$1,800 and \$2,100. In preliminary regressions, I also tested whether the price depended on the precise RIC number (26, 28, or 30), the coin’s weight, and whether it was pictured in the auction catalog. None of these factors turned out to be important. The F grade category also includes coins graded VF/F.

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Table 1
What Determines the Price of a Tribute Penny

Grade	Average Price (\$)
EF	634
EF/VF and VF/EF	430
VF	284
F	180
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Defects and Merits	Effect on Price (\$)
Manufacturing defect (offcenter, irregular flan, etc.)	-135
Preservation defect (porosity, scratches, etc.)	-33*
Good style	+28*
Toning	+34*
Sold in Europe	+28*

Note. The estimates are based on 132 auctions in 1995-1996. All values are expressed in year-2003 dollars. An asterisk means the effect is not statistically significant. The numbers were estimated from a multivariable regression, as described in the note at the end of the article.