The Probability of Meeting your Low Estimate at Sotheby's American Paintings is just 57% (at Christie's it's only 45%)

In his rebuttal (Maine Antique Digest 1/01) to my article "Gauging the Art Market by its Broad Indicators and Never Mind Bill Gates" (Maine Antique Digest 11/01) Eric Widing makes the point that every seller he has ever met wants high prices at auction. And, in his justification of the obvious, Eric implies that Christie's welcomes and somehow even orchestrates volatility, because volatility produces the kind of high prices favored by customers who have chosen to sell at Christie's. He then recites the long-established ruse that "record prices" at Christie's for Cassatt specifically are an indication of the success of the auction process at Christie's generally. As proof, Eric enumerates that Christie's holds world auction records for works by Cassatt, Henri, Redfield, Benton, Hassam, Heade (for still life), O'Keeffe, Potthast, Remington and Wyeth (on paper) among "dozens and dozens" more.

But "records" are just a paper-thin slice of Christie's overall performance history: what about the rest? Is the whole mechanism in place to serve the lucky owners of a handful of paintings destined by who-knows-what invisible hand to make "records?" Eric concludes: "No other auction house can match the success Christie's has achieved in this arena."

Trouble is, according to the data, Sotheby's American paintings beats Christie's by every measure we can think of, most prominent among them record prices. In fact, far from unmatched success, the data in this article will show that, over the last 19 years, volatility has caused results at Christie's to fall $32 million short of Low Estimates, which are their own - and their customers' – minimum expectations.

True, the process, at both Sotheby's and Christie's, has produced some high - even obscenely high – prices, some for O'Keeffe and others for Bellows. But outliers, a few dozen phenomenal data standing apart from tens of thousands in a cluster, do not, by themselves, characterize the set. And volatility, a measure of dispersion of individual events around a mean, measures *all* variations away from the center; you cannot invite only its pleasure on the upside, as Eric suggests they do at Christie's, without simultaneously introducing its genuine anguish on the down. So let's put the notion of "record prices" and the influence of volatility on auction results into stunningly clear perspective. In so doing, we shall look only at numbers, but *all* the numbers, not just the chosen few.[1]

Surely anyone playing the lottery knows he is participating in an event that, in an instant, produces just one or two winners and millions of losers. Of course, lottery is a "beggar-

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[1] In their zeal to apply the notion of "record prices" the auction houses parse the work of each painter into as many categories as they can think of, oil paintings, works on paper, landscapes, still lives, sculpture etc. posting records for each. For the purposes of this discussion, top prices are listed once for each artist.

thy-neighbor" scheme not analogous to auction. But both shamelessly promote themselves by concentrating attention upon a few winners deflecting scrutiny away from the discomfort experienced by many, many losers. To disrupt this view in the following analysis, we will look at auction system-wide, not at selected, isolated "records" and the devil take the rest.

Our analysis is built upon auction sale data. In our data set, there are 30,425 market events comprising a sample of the population All Auctions of American Art Everywhere.[2] Broadly, here is how the sale results at Sotheby's and Christie's compare:

	Market Events	# lots sold	# lots Bi	Sum Hammer Prices
Sotheby's	13,698	10,431	3,267	$781,354,000
Christie's	16,727	11,729	4,998	$540,449,000
Total	30,425	22,160	8,265	$1,321,804,000

These data tell us that over the period 1983-present, Sotheby's American paintings has offered 3,029 fewer lots and sold 1,298 fewer lots than Christie's American paintings, but that Sotheby's has received $240,905,000 more value.

The 30,425 market events comprise 22,160 sold paintings by 2,019 artists, each of whom sold at least one work.[3] Obviously, since every artist with at least one sold lot in the set has no less than one highest price, there are 2,019 "record prices" in the set. They range from the magnificent $25,000,000 to the lowly $100. Just as obviously, Sotheby's set some of the record prices and Christie's set others. If records were important, we would need to know which house sets more.

Here is a simple count of *all* the record prices attributable to Sotheby's and Christie's, one for each of the 2,019 American artists in the set along with the percentage that each count represents of the total. And, because there are 'important' record prices and unimportant ones, here too is how those record prices aggregate in value for each house: (High is good. Best in **Bold**)

Sotheby's	877	43%	**$165,112,000**
Christie's	**1142**	**57%**	$97,252,000

These data indicate that Christie's holds more records numerously than Sotheby's but that Sotheby's' records aggregate to a higher value, implying that Christie's' records congregate toward the bottom of the value scale. But auction houses never boast about record prices for minor artists so let's pick a value level - shall we say $35,000? – and disregard all the artists with records below that figure. Strikingly, because the data are right-skewed, that would be 71% of the 2,019 records just listed, leaving just 578

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[2] Market events in our database from Phillips and elsewhere are not included in this study.
[3] There are actually 2,409 artists in our sample but 390 of them appeared one or more times but sold no works.

"important" record prices to go around. So here again is the table above, incorporating this adjustment: (High is good. Best in **Bold**)

Sotheby's	**358**	**62%**	**$158,151,000**
Christie's	220	38%	$89,109,000

These data indicate that Sotheby's holds more important record prices numerously than Christie's and Sotheby's' records still aggregate to a higher total value than Christie's'. Moreover, while we mentioned neither Cassatt, Henri, Redfield, Benton, Hassam, Heade (for still life), O'Keeffe, Potthast, Remington nor Wyeth (on paper) - all records held by Christie's - they are all in there somewhere. Still, important record prices amount to only 1.3% of all lots offered at Christie's. Eric says we choose to "…ignore one of the most elemental measures of auction success." Is this one significant? When we see numbers like these, unmatched success is not the first thought that comes to our minds.

Certainly, at some time in our lives, we have all been asked to measure up to some imposed standard, be it grades in school or a quarterly earnings forecast. Of particular importance in the art auction system is that three to four months prior to each and every market event, experts at Sotheby's and Christie's set their own standards. We recognize the Low Estimate as that standard. What standard for performance could be simpler to meet than one set by and for one's self?

Let us suppose for a moment that a new consignor with one picture goes to both houses and receives two very different estimates. High is the preferred outcome but an estimate is a prediction of some event that will take place in the future and estimates are not results: how will that consignor determine in advance the probability of making the Christie's estimate and how will he or she compare that to the probability of making the Sotheby's estimate?

Even consignors naïve enough to believe that past record prices indicate something about their own future chances do not deserve to be misled. Record prices indicate nothing more about the probability of results at Sotheby's or Christie's than the quatrains of Nostradamus. The consignor's answer lies, instead, in knowing how closely experts at Christie's or Sotheby's have come to their own Low Estimates in *all* past market events.

We express that measure, comprising both positive and negative deviations, as volatility. Volatility, working within an empirical range, measures the <u>extent</u> to which different assets demonstrate deviation away from either side of their central tendency. US Treasury bills vary little in their range of returns, while e-commerce stocks fluctuate violently within theirs. Empirically, art prices behave similarly. The market for some artists operates within a narrow range, for others in a broad one. And the range at one house is not necessarily the same as at the other.

Here is how volatility is indicated for all American paintings' events attributable to Sotheby's and Christie's presented, for the sake of brevity, in two-year increments: (Higher values indicate higher risk. Best in **Bold**)

	Sotheby's	Christie's
1983-1985	**0.079**	0.226
1986-1988	**0.061**	0.122
1989-1991	**0.044**	0.150
1992-1994	**0.144**	0.269
1995-1997	**0.140**	0.699
1998-2000	0.102	**0.092**
2001	**0.028**	0.112

The values in the table preceding are aggregated over all records for the years indicated but the components of these indexes are volatilities for individual artists and volatility comprises both positive and negative deviations. Here are the aggregate positive and negative deviations attributable to Sotheby's and Christie's American paintings and the volatility that comprises them both for all records in the set: (Best in **Bold**)

	Positive Deviation (high, if there were no negative, would be nice but is still bad because)	Negative Deviation (which always comes with it, is decidedly bad)	Both are Components of Volatility (lowest is best)
Sotheby's	**0.050**	**0.096**	**0.129**
Christie's	0.055	0.234	0.222

Keep in mind that at auction, we are tempted to regard higher, positive deviations, by themselves, as a good thing. But when Eric writes: "…a work that soars in competitive bidding to a high or even a record price does not offer greater risk: it offers greater return" he fails to distinguish between <u>risk</u>, which all pictures and their consignors acquire *before* the sale and <u>greater return</u>, which only some consignors will experience *after* the sale. Because prior to the sale both the direction and extent to which Hammer Prices will vary from estimates are matters of uncertainty, volatility in any amount always indicates greater risk for consignors (at either house.) Since risk management is what we are about here, our methodology measures how well experts control risk, which they do by first setting realistic, attainable standards and then meeting them.[4] "Good" auction estimates are presumably intended by experts at both houses to be reliable predictors of results. And setting reliable predictors of results is a matter of skill and discipline.

To get a handle on how volatility interferes with control, it is vitally important to understand that the territory below the Low Estimate - through which all bidding must invariably pass - is booby-trapped by the reserve while in the territory above it, the bidding is free. This means that Hammer Prices with large negative deviations, *i.e.* those that are too far below Low Estimates, risk (there's that 'R' word again) going unsold, or Bought-in. So volatility contributes mightily to both high prices and even more mightily

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to Bi's. That is because volatility giveth *and* volatility taketh away and Sotheby's and Christie's, each in their own way, supply the data to prove it.

Eric suggests that Christie's orchestrates volatility but if they could, it would actually be preferable for Christie's to *eliminate* volatility altogether and hit their Low Estimates lot after lot rather than allow Hammer Prices to deviate below or even above estimates.

Here is proof of this bizarre assertion. In the following table, we see the sum of pre-sale Low Estimates for all lots that were offered at Sotheby's and Christie's American paintings contrasted to the sum of all Hammer Prices associated with those lots. (Best in **Bold**)

	Σ (all Low Estimates 1983-present)	Σ (all Hammer Prices 1983-present)	Gain (Loss)
Christie's	$572,275,000	$540,449,000	(-$32,826,000)
Sotheby's	**$726,810,000**	**$781,354,000**	**$54,544,000**

In the table, the sum of all Hammer Prices excludes the value of all Bi's but includes both the positive and the negative deviations, both components of volatility. Were either auction house to hit their Low Estimates exactly every lot – zero volatility - the two sums for Low Estimates and Hammer Prices would be equal. Since they are not, the data isolate volatility's effect.

The data show unequivocally that Christie's, demonstrating a higher, overall volatility, has fallen $32 million short of their own Low Estimates while Sotheby's, demonstrating a lower volatility, has exceeded theirs by $54 million. Once again, this is because the Low Estimate at both houses impounds the Reserve, which causes roughly one in every four lots offered in American paintings (at either house) to go unsold. These lots fail to sell because extreme negative deviation, an unavoidable component of volatility especially notable at Christie's, prevents bidding from reaching Reserves, let alone Low Estimates.

To amplify this point, here is a count of all lots that were Bi at Sotheby's and Christie's American paintings accompanied by the percentage that Bi's represent of all lots offered in the set and their aggregate values (Low Estimates): (Lowest is best, in **Bold**)

Sotheby's	**3,287**	**24%**	**$176,551,650**
Christie's	4,995	30%	$181,654,550

Notwithstanding the quest for record prices, which we presume to go on at both houses, these data indicate that Christie's bought-in 1,708 more lots than Sotheby's while each house forfeited for themselves and their consignors about $180 million of value. More importantly, since in the aggregate the value of Christie's' Bi's ($181,654,550) vastly exceeds the value of their total record prices ($97,252,000) Christie's failure rate, as a measure of their customers' disappointment or satisfaction, is at least twice as important as their conventional measure of success.

Let us return now to the fictitious consignor with one American picture – any picture - who went to both houses and received two very different estimates. High is always the preferred outcome but a "good" estimate must be, above anything else, a reliable predictor of results. How does the consignor know if it is?

Properly cast, a good estimate is really a probability statement encompassing two events:

(i)   Whether the underlying lot will sell at all and
(ii)   Whether the underlying lot will sell at (or above) its Low Estimate.

The probability of each of these separate events is derived from the data we have just seen. To assess the probability of dependent, sequential events, take their product: (High is good. Best in **Bold**)

	Probability of making a sale	Probability of meeting or exceeding Low Estimate	Probability of both events
Sotheby's	**76%**	**74%**	**57%**
Christie's	70%	65%	45%

Whatever the painting, whatever the estimates, the choice is about as close to a "no-brainer" as the process presently affords.

Just one more thing: Eric asserts: "[Maroney's] premise, that an auction sale that exceeds the high estimate represents greater risk, defies common sense." I take his point exactly. In fact, the value of statistical analysis is precisely that it *does*, so we may draw informed inferences from something far more reliable than common sense: hard data.

I invite your comments and/or criticism mailto:james.maroney@artpocket.com