

Art Is Twice as Risky as Your Report Says

What to put in the risk report when the family's art comes into it, how much the portfolio can carry, and what your numbers understate if you leave it out.

A note on what is ours and what is not. Every portfolio figure below is computed live from our own capital markets assumptions: expected returns, volatilities and a full correlation matrix across fifty-eight asset classes. Every art figure is third party, taken from the primary source document in each case rather than from secondary commentary. We hold no art market data and do not claim to.

This paper takes no view on whether a family should own art. Families own art for inheritance, for the wall, and for the pleasure of it. Those are good reasons and none of them is our business. The question here is narrower and entirely technical: once it is owned, what number represents it honestly, and what follows from that number.

The proposition that started this

An approach reached us earlier this year. A work of art, offered to a private client, in the range where these things become portfolio decisions rather than purchases.

It was a serious proposition. The artist holds work in half a dozen national museum collections, and we checked. The auction results quoted in the pitch were real, and we verified every one of them independently against three separate databases. The dealer was a genuine, long-established gallery with a permanent space and a decade of trading history. The five-year performance record attached to the email was not fabricated.

Every number in it was true. **None of them was usable.**

That distinction turns out to matter far beyond one proposition, because the same problem sits inside the risk report of almost every family that owns art. Here is the shape of it. We built a representative family office portfolio, consolidated an art sleeve into it at the kind of valuation a family actually holds on file, and measured the result.

The measured risk of the household went down.

Art sells when it has gone up, and every number you have follows from that

Most art is sold privately, through dealers who do not register prices in any common database. Auction records are effectively the only data available, and they are not a sample of the art market. They are a sample of the art that came back to market.

Those are different things, and the difference has a direction. A work returns to auction when its owner believes it is worth selling. Works that have appreciated come back. Works that have not stay on the wall, move privately, or never trade again.

This is not our inference. It is the explicit caveat of the foundational study in the field. Mei and Moses, whose 1875 to 2000 repeat-sales dataset remains the reference work, write that the decision to sell a work of art, and therefore the occurrence of a repeat sale in the sample, may be conditional on whether the value has increased, and that this biases

the estimated return upward. Their conclusion is that the mean annual return derived from repeat-sales data should be regarded as **an upper bound** on what investors actually earned.

Every art index in the world is built on that sample. So is every dealer's track record. So was the five-year performance summary attached to that email.

Every return figure you will ever be shown for art, academic or commercial, is biased in the same direction, and the bias is upward. That is the starting position, before anyone has tried to sell you anything.

The market is also thinning underneath the headline. In 2025 the art market returned to growth, with sales up 4% to \$59.6 billion. But the recovery was concentrated: auction sales above ten million dollars rose about 30%, while the number of works sold barely moved. Money is stacking at the very top. Our inference, not a sourced claim: for a family holding work below that level, the observable market is thinning even as the headline number grows.

The reported volatility is roughly half the real one, and two independent methods agree

This is the single most useful fact in this paper.

What gets reported. The MM European Art Price Index, the most current transparent series available, records an annualised return of 2.3% over 2000 to 2025 with a return standard deviation of **9.8%** and a correlation to European and UK equities of 0.353 and 0.348. On those numbers art is the least volatile asset in its own comparison table, against 20.4% for Euro large cap and 20.2% for the FTSE All-Share.

A small illustration of this paper's own theme, in passing. The same research group publishes that volatility as 9.8% in its October 2025 European report and as 9.5% in its Spring 2025 global report. Both are primary, the windows differ slightly, and the gap is immaterial to anything below. We use 9.8%. We mention it only because a paper about the precision of art inputs should not quietly pick the more convenient of two published figures without saying so.

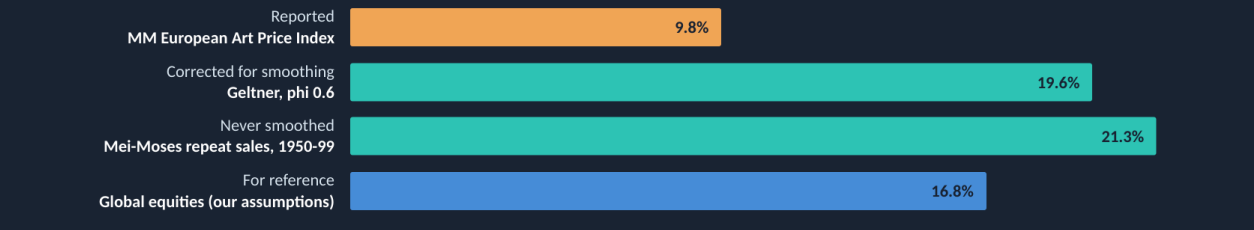
That 9.8% is the number that reaches a family office risk report, directly or through a dealer mark that behaves the same way. It is too low, for a reason that has nothing to do with art.

Route one: correct the smoothing. An appraisal-based or dealer-set mark is anchored on the previous mark, which suppresses measured volatility and measured correlation. The finance literature has corrected for this in real estate since Fisher, Geltner and Webb published the procedure in 1993. The first-order correction gives true volatility as observed volatility multiplied by the square root of $(1 + \phi)$ over $(1 - \phi)$. At a ϕ of 0.6, the conservative end of the range that literature finds, **9.8% becomes 19.6%.**

Route two: use a series that was never smoothed. Mei and Moses measured volatility directly from auction repeat sales, with no appraisal in the chain. For 1950 to 1999 they report **21.3%.**

The reported volatility is roughly half the real one, and two independent methods agree

Annual volatility of art, by how it is measured



Two unrelated routes to the true figure. One imports an unsmoothing parameter from commercial property, the other measures auction repeat sales directly across half a century. They land within 1.7 percentage points of each other, and both are roughly double the reported figure.

Sources: MM European Art Price & Sentiment Indices (CKGSB & SDA Bocconi, Oct 2025); Mei & Moses (2002), American Economic Review 92; Fisher, Geltner & Webb (1993). Equity volatility: 3HC capital markets assumptions 2026.

Two unrelated methods. One imports a parameter from commercial property, the other measures auction prices directly across half a century. **They land within 1.7 percentage points of each other, and both are roughly double the figure that gets reported.**

A figure we are not using, and why. Mei and Moses also report 42.8% volatility for the full 1875 to 1999 window, and it is tempting, because it makes this argument louder. Their own footnote explains it: the number of artworks in the index portfolio increased rapidly after 1935, so the early period is thin. That is a small-sample artefact, not a measure of art's risk. Using it would be precisely the error this paper is about. The defensible figure is 21.3%.

What the measurement error costs

We built a representative eleven-sleeve family office portfolio: a developed-equity core, a large private-markets allocation, modest fixed income, meaningful cash. On our own capital markets assumptions it carries an expected return of 6.95% and a volatility of **11.06%**.

Then we consolidated an art sleeve at 28% of total wealth, the average share held by individuals above fifty million dollars of assets, entered at the 9.8% volatility that gets reported.

It reverses the sign on the risk contribution

TREATMENT	ART VOLATILITY	TOTAL WEALTH VOLATILITY	ART SHARE OF TOTAL RISK
As reported	9.8%	9.29%	17.6%
De-smoothed, phi 0.5	17.0%	10.61%	31.9%
De-smoothed, phi 0.6	19.6%	11.14%	36.6%
De-smoothed, phi 0.7	23.3%	11.94%	42.7%
Unsmoothed repeat sales	21.3%	11.50%	39.5%

Add a 28% art sleeve at its reported mark and measured household risk falls

Total wealth volatility, representative family office portfolio



A position worth more than a quarter of the family's wealth, with no exchange, no daily price and no reliable exit, reduces measured risk by 1.77 percentage points. That is the tell. Tested across 27 configurations of portfolio shape, art weight and correlation, the reported mark reduced measured volatility in 27 of 27.

Portfolio figures computed live from 3HC capital markets assumptions 2026 (58 asset classes, full correlation matrix). Art sleeve 28% of wealth, the UHNW average per Art Basel & UBS 2025.

The family adds a position worth more than a quarter of its wealth, in an asset with no exchange, no daily price and no reliable exit, and measured household risk **falls by 1.77 percentage points**.

We tested that across twenty-seven configurations: three portfolio shapes, art weights of 15%, 20% and 28%, correlations of 0.20, 0.35 and 0.50. **The reported mark reduced measured volatility in twenty-seven of twenty-seven.** We could not construct a case where it did not.

Correct the input and the art sleeve moves from 17.6% of the household's risk to between 36.6% and 39.5%, depending on which of the two routes you take. **The two routes agree with each other far more closely than either agrees with the reported figure.**

It reverses the allocation decision

ART VOLATILITY INPUT	ART RETURN 2.3%	ART RETURN 5.0%	ART RETURN 7.7%
As reported, 9.8%	0.0%	22.4%	above 60%
De-smoothed, 19.6%	0.0%	0.0%	19.3%
Unsmoothed repeat sales, 21.3%	0.0%	0.0%	15.2%

Correct the volatility and the model's appetite for art falls to nothing

Allocation to art chosen by a long-only maximum-Sharpe optimiser, art return held at 5.0% nominal



Same expected return. Same correlation. Same portfolio. The only difference is whether the volatility was corrected before it entered the model. Mean-variance optimisation is the wrong tool for sizing an illiquid, indivisible, emotionally held asset and is not proposed as one here. It is used as a diagnostic: an error in an input does not stay in that input, it propagates into an allocation.

Optimiser chooses between the family's financial portfolio and the art sleeve, long only, risk-free rate 3.10% (3HC capital markets assumptions 2026).

A long-only maximum-Sharpe optimiser, choosing between the family's financial portfolio and its art, wants 22.4% of the household's wealth in art on the reported input and nothing at all on the corrected one. Same expected return, same correlation, same portfolio.

The same reversal shows in the risk-adjusted return of the sleeve on its own, against a 3.10% risk-free rate:

ART TREATMENT	VOLATILITY	SHARPE AT A 7.7% RETURN
As reported	9.8%	+0.469
De-smoothed	19.6%	+0.235
Unsmoothed repeat sales	21.3%	+0.216
Global equities, our assumptions	16.8%	+0.238

On the reported number, art looks roughly twice as good as owning the world's stock markets. Corrected, it is indistinguishable from them. And unlike global equities it cannot be sold on Tuesday, cannot be borrowed against on the same terms, costs money to store and insure, and carries the risk of physical loss.

A note on method, because the objection is fair. Mean-variance optimisation is the wrong tool for sizing an illiquid, indivisible, emotionally held asset, and we are not proposing it as one. It is used here as a diagnostic. It shows that an error in an input does not stay in that input; it propagates into an allocation recommendation. Any allocation process fed a smoothed number leans the same way, whether that process is an optimiser, a risk budget, or a committee's judgement.

The input set we would actually use

Volatility: 19.6%, not 9.8%. Derived by the Geltner correction at a phi of 0.6, and independently corroborated by the 21.3% unsmoothed repeat-sales figure. We use the lower of the two.

Correlation: 0.44, not 0.35. Smoothing attenuates covariance with liquid markets by a factor of $(1 - \phi)$ while attenuating the standard deviation by the square root of $(1 - \phi)$ over $(1 + \phi)$. Correlation therefore recovers as the observed correlation divided by the square root of $(1 - \phi)$ squared. The published figure is 0.353 against European equities and 0.348 against the FTSE All-Share; we use 0.35 throughout, and at phi of 0.6 it becomes 0.44. **Correlation is the channel through which art claims to be a diversifier, so understating it is what makes the position appear to reduce household risk.**

PHI	CORRECTED VOLATILITY	CORRECTED CORRELATION
0.5	17.0%	0.40
0.6 (recommended)	19.6%	0.44
0.7	23.3%	0.49

Expected return: underwrite around 4% nominal. The MM regional indices, all quoted as nominal dollar returns from late 2000 to Spring 2025, give a compound annual growth rate of **2.3% for Europe** and **7.7% for Asia, Africa and Oceania**, both confirmed against the primary report. The Americas index sits between them, at a figure we have seen quoted as 4.1% but could not locate in the primary text, so we do not rely on it.

Four percent is a deliberate choice rather than an average. Europe dominates the underlying sample, with 5,578 of the 7,914 artists covered, against 913 for Asia, Africa and Oceania. A sample-weighted blend therefore sits much closer to 2.3% than to the midpoint. **Four percent is generous, not conservative**, and if you want a conservative input, use Europe's 2.3%.

A correction we owe the reader, because we made this error ourselves in an earlier draft. We previously quoted a range of 2.3% nominal to 8.2% real as though it were one range. Those two figures are not on the same basis, and we have now confirmed it against both primary sources. Mei and Moses state that their returns are computed as the nominal return minus annual inflation using the US CPI index, so 8.2% is **real**. The MM regional indices are stated as dollar returns, so 2.3% is **nominal**. Quoting one against the other overstates the top of the range by roughly the rate of inflation. The range above is nominal throughout.

Two further disciplines on the return. The most recent ten-year annualised readings are negative, at minus 0.9% in 2023 and minus 1.4% in 2024, the weakest since 1954. And on the primary source's own numbers for 1950 to 1999, art returned 8.2% in real terms against 8.9% for the S&P 500 and 9.1% for the Dow. **Art underperformed equities in the period usually cited to show that it did not.** Treat a quoted return above 8% as a marketing figure until proven otherwise.

How much the portfolio can carry

Express the limit as a share of the risk budget, not a share of wealth, because that is the constraint that binds.

IF ART MAY CONSUME THIS SHARE OF TOTAL PORTFOLIO RISK	CAP THE SLEEVE AT THIS SHARE OF WEALTH
10%	9.7%
15%	13.5%
20%	17.0%
25%	20.2%
33%	25.3%

Set that against what families actually hold:

At the allocation families actually hold, art is a third of portfolio risk and the report shows a fifth

Art's share of total portfolio risk, by how the sleeve is marked

ART AS A SHARE OF WEALTH	RISK SHARE, REPORTED MARK	RISK SHARE, CORRECTED	UNDERSTATED BY
15%	7.0%	17.1%	2.4x
20%	10.5%	24.6%	2.3x
28% (UHNW average)	17.6%	37.4%	2.1x

The correction roughly doubles the art sleeve's contribution to household risk at every allocation families actually hold. A family at the ultra-high-net-worth average is running a position that consumes **more than a third of its total portfolio risk while the risk report shows less than a fifth**.

Corrected inputs: volatility 19.6%, correlation 0.44, both derived from the published figures by first-order Geltner correction at phi 0.6.

ART AS A SHARE OF WEALTH	RISK SHARE, REPORTED MARK	RISK SHARE, CORRECTED
15%	7.0%	17.1%
20%	10.5%	24.6%
28% (UHNW average)	17.6%	37.4%

A family at the ultra-high-net-worth average is running a position that consumes 37.4% of its total portfolio risk on corrected inputs, while the risk report shows 17.6%. More than a third, reported as less than a fifth.

If it is one artist, the answer changes completely

Every published art index is a diversified basket. The MM European index alone rests on 19,258 repeat sales across 3,821 artists. A single-artist position carries idiosyncratic variance that a basket of that size has diversified away, so **the index volatility is a floor for a concentrated position, never an estimate of it.**

No published single-artist multiple exists that we could find. The multiples below are illustrative:

SINGLE-NAME VOLATILITY	CAPACITY AT A 25% RISK BUDGET
1.0x index (19.6%)	20.2% of wealth
1.5x index (29.4%)	14.5% of wealth
2.0x index (39.2%)	11.3% of wealth
3.0x index (58.8%)	7.8% of wealth

Two rules therefore govern two different cases. **A diversified collection is governed by the risk budget above. A single name with no independent secondary market is governed by survivability**, which binds far tighter: for a position that could plausibly be worth nothing, the question is not what share of the risk budget it consumes but what share of the family's wealth can be written off without changing anything that matters. In practice that is a low single-digit percentage, smaller than any row above.

Testing whether the secondary market is real

Count the lots, count the auction houses, count the years. Then read the provenance notes. If the sellers into that market were themselves clients of the original dealer, it is not an independent market testing the price. It is a closed loop.

And read everything the counterparty has written, together, because the exit is often not what it appears. In the proposition that opened this paper, the sales material presented the dealer's right of first refusal as a benefit: whenever the collector decides to sell, the dealer will have the opportunity to make an offer before the work goes elsewhere, described as an additional layer of support and liquidity. The same dealer's own performance document stated that participation in its buyback programme is offered at the dealer's discretion and is not a guaranteed or contractual right.

Read those two sentences together. **A right of first refusal is an option the dealer holds. It confers a right to buy and no duty to buy.** Its effect on the collector is to narrow the exit, because the work must be offered to the dealer first. And the one channel through which it might become real liquidity is discretionary, by the seller's own written admission.

Neither statement was false. They had simply never been read side by side.

One question worth asking early, because it is almost never volunteered: **of everything you have sold through this programme, what share has been bought back?** A buyback record without a denominator is a list of the trades that worked.

The whole thing, on one family

A household with thirty million dollars of wealth, six million of it art. Twenty percent, just under the collector survey average.

What the report says today. Financial portfolio of twenty-four million, volatility 11.06%, illiquid holdings 41.0% of the portfolio. The art does not appear.

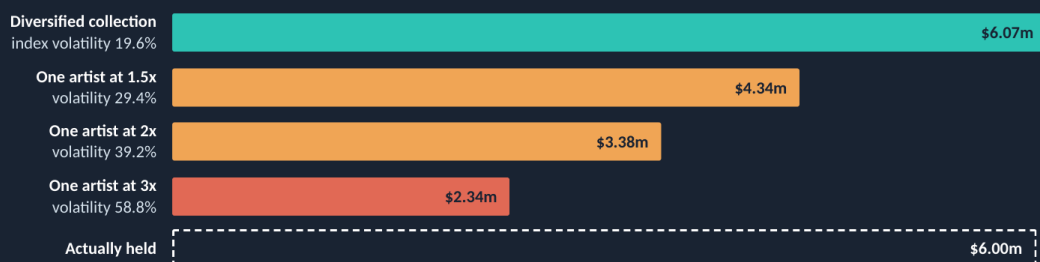
Consolidate it at the mark on file. Art at 9.8% volatility and 0.35 correlation. Total wealth volatility 9.71%, which is 1.35 points *below* the report that excluded it, and the art shows as 10.5% of total risk. A six million illiquid position has made the household look safer. That is the diagnostic, and it is the moment to stop and check the input.

Correct the inputs. Volatility 19.6%, correlation 0.44. Total wealth volatility 11.13%. The art's share of total risk moves from 10.5% to **24.6%**.

Test it against capacity. At a 25% risk budget the ceiling is 20.2% of wealth, or 6.07 million.

The same \$6 million of art is either prudently sized or nearly three times too large

Capacity at a 25% risk budget, household with \$30m of wealth holding \$6m of art



Nothing about the valuation decides which of these applies. What decides it is whether the collection is one name or many, and that is a question no dealer's performance summary will ever put in front of you. Single-name multiples are illustrative: no measured multiple has been published, so the index figure is a floor for a concentrated position, never an estimate.

Capacity solved for the art weight at which the sleeve contributes 25% of total portfolio risk, using corrected inputs.

That is the finding worth carrying away. The same six million dollars of art, in the same household, on the same day, is either prudently sized or nearly three times too large. Nothing about the valuation decides it. **What decides it is whether the collection is one name or many**, and that is a question no dealer's performance summary will ever put in front of you.

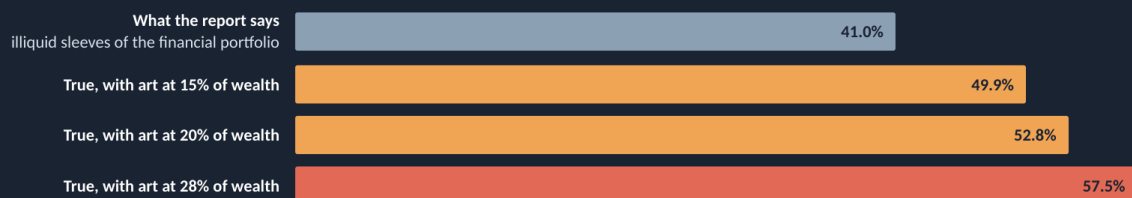
State the true illiquidity. The report says 41.0% illiquid. Including the art it is **52.8% of the family's wealth**, 15.84 million of thirty. Understated by 11.8 points.

If you exclude the art entirely, this is what your report understates

Many family offices deliberately leave art out of the investable portfolio. It is the family's, not the mandate's. That is defensible, and this is what it costs.

Leave the art out and the report understates the family's illiquidity by up to 16 points

Illiquid holdings as a share of total household wealth



This is the one result in the paper that requires no estimate of art's return, volatility or correlation. It follows from the weights alone, which is why every objection to the rest of the analysis leaves it standing. Excluding art from the risk model is a legitimate choice. Excluding it from the illiquidity line is not.

Illiquid sleeves: private equity, venture capital, core real estate, direct lending, diversified hedge funds. Representative family office allocation.

ART AS A SHARE OF WEALTH	REPORTED ILLIQUID SHARE	TRUE ILLIQUID SHARE OF WEALTH	UNDERSTATEMENT
15%	41.0%	49.9%	+8.9 pts (1.22x)
20%	41.0%	52.8%	+11.8 pts (1.29x)
28%	41.0%	57.5%	+16.5 pts (1.40x)

This requires no estimate of art's return, volatility or correlation. It follows from the weights alone, which is why every objection to the rest of this paper leaves it standing.

Exclusion is a legitimate choice, on one condition: if the art is excluded from the risk model, it must also be excluded from any claim about diversification, and the family's true illiquidity stated somewhere in the pack. What is not defensible is exclusion by default, because nobody had a number.

A reporting convention that survives contact with the family

One. State the provenance of the mark, every time. Independent appraisal, dealer quote, historic cost or insurance value. If the party that supplied the number benefits from it being high, say so on the same page. This costs nothing and it is the highest-value disclosure in the report.

Two. Show raw and corrected side by side. The mark as received, then the de-smoothed volatility used for risk budgeting, labelled. Do not quietly substitute one for the other.

Three. Report the art sleeve's share of total portfolio risk, not just its share of wealth. Wealth share understates it by roughly two times at every level families actually hold.

Four. State the total illiquid share of household wealth, including the art, on the front page. It is the one figure here that no assumption can argue away.

What we cannot tell you

We hold no art market data. Every art figure here is external and has been checked against the primary source document rather than secondary commentary.

The de-smoothing parameter is imported by analogy from real estate. No art-specific published parameter exists, so we have used that literature's range, shown the sensitivity, and cross-checked the result against an independently constructed unsmoothed series.

The proxy indices carry the endogeneity described above, which their own authors flag. The independent range is probably flattered too, at a much larger and more disinterested sample size.

The Americas regional return is the one figure in this paper we could not locate in a primary source, so we have excluded it from the recommendation rather than lean on it.

The portfolio weights are a representative construction, not a real family's book. And the single-name multiples are illustrative; we could not source a measured one.

What does not depend on any of that: give a portfolio model a smoothed input and it will understate risk and lean toward more of the asset. Twenty-seven of twenty-seven. And the illiquidity understatement follows from arithmetic alone.

Why this is a client conversation and not a modelling footnote

If art is a fifth to a quarter of a client's wealth and it does not appear in your reporting, a meaningful share of the balance sheet you are supposed to be advising on is somewhere you are not. Someone else is having that conversation: a dealer, an auction specialist, a private-client lawyer at the point of succession. Each of them is advising on an asset you have no number for.

The firms that keep those relationships through the next transfer of wealth will be the ones that can put the whole balance sheet on one page and defend every number on it, including the difficult one. That does not require becoming an art expert. It requires being willing to say what the art is worth in risk terms, on what basis, and with what uncertainty.

The part of a client's wealth you do not report on is the part where you are not the adviser.

Sources. Portfolio returns, volatilities and correlations: Three Horizons Capital capital markets assumptions, 2026 vintage, fifty-eight asset classes, full correlation matrix, computed live. Art market data, all third party and checked against the primary source in each case: Art Basel and UBS Global Art Market Report 2026 and Survey of Global Collecting 2025 (Arts Economics); Mei and Moses, "Art as an Investment and the Underperformance of Masterpieces," American Economic Review 92 (2002); MM European Art Price and Sentiment Indices, CKGSB and SDA Bocconi, October 2025; MM Art Indices Spring 2025; Fisher, Geltner and Webb (1993) and the related real estate unsmoothing literature.

This paper is a measurement and reporting discipline. It is not a certified art market index, it is not investment advice, and it is not a recommendation to buy, hold or sell any asset.