Axioma Private Markets Factor Risk Model

A collaboration that delivers insights into private market fund risk

Qontigo has partnered with CEPRES, the leader in private market investment data, analytics and technology, to develop a suite of private market factor risk models for unique insights into private capital fund risks in multi-asset class portfolios.

Leveraging the industry-leading Axioma Equity Factor Risk Model suite of public market models, the private asset models allow for meaningful risk analysis and factor decomposition across both public and private assets. This document provides a high-level overview of the data sources, model coverage, methodology and delivery that support the production of the models.

The key benefits of data

A key benefit of the fund data that CEPRES provides is that the cash flows are on the fund level from the perspective of the fund investors. These cashflows represent what Limited Partners have paid out as investments and received back as distributions from General Partners after fees have been deducted — in other words, net cash flows. Therefore, the actual returns that investors receive can be calculated in real terms, and no assumptions about GPs' fees are necessary.

Qontigo provides daily public market factors returns, aggregated to monthly, to help explain the observed private fund returns. These factors capture overall market performance as well as the performance associated with key company characteristics of both public and private firms such as size, value and leverage. In addition, factors important for modeling multi-asset class risk including rates, inflation, credit, FX and commodities are available in the Axioma Risk platform to allow for a true public-private portfolio risk analysis.

Qontigo

Global leader in risk analytics

Qontigo brings expertise on public market factor risk models, with an extensive history of data on factor returns going back for some markets to the early 1980's. The models are produced daily through a cross-sectional regression of returns for a large liquid universe of publicly traded equities in each region for which a model is generated. The factors are a parsimonious set of distinct an economically meaningful drivers of return based on company fundamental data, market data and industry classifications. The factors are proven to be stable and statistically significant in explaining equity performance.

CEPRES

Private market intelligence and analysis

CEPRES has collected over 25 years of data on over 10,800 private asset funds and 108,000 deals sourced directly from GPs, making it the most accurate, actionable private market data source available. CEPRES connects buy- and sell-side market participants who report monthly cash flows with additional information (relating to the type of industry, investment stage, etc.) for each fund they have raised. All data is primary-sourced and verified. CEPRES handles all information anonymously so that the PE industry's requirements for confidentiality and data protection are satisfied.

Private fund model coverage

Coverage data for Private Markets Factor Risk Models

This table summarizes the criteria used for selection of funds in the model estimation universe. For the first model release, data for these risk models has been sourced from funds between the starting year through 2021 for all the categories and geographies. Additionally, certain filters have been applied to the fund selection to remove funds without sufficient data or outlier funds with unusual cash flows that may skew the model calibration.

Fund category	Number of funds	Starting year	Min. fund maturity	Min. TVPI	Max TVPI
North American Buyout	720	1997	7 years	.75	3.30
European Buyout	497	1998	7 years	.75	2.85
Asian Buyout	151	1998	7 years	.75	3.57
North American Venture Capital	206	1997	7 years	.5	3.47
Global ex-North American Venture Capital	141	1998	7 years	.5	3.26
North American Real Estate	188	2002	5 years	.5	2.29
Global ex-North American Real Estate	124	1999	5 years	.5	2.23
North American Private Debt	140	1997	5 years	.75	2.63
Global ex-North American Private Debt	119	1998	5 years	.75	2.03
Global Infrastructure	189	2001	5 years	.5	2.44

Model estimation universe criteria

Starting year

The starting year for each fund category has been chosen to ensure there are a sufficient number of funds in each analysis year to calibrate the model. In particular, a small number of funds in the early years may lead to several months with no observed cash flows, which can impact the effectiveness of the model calibration method. For the real estate models, we have also found that the inclusion of funds from the late 1990s substantially influences factor selection and model calibration. Thus, we have found it more stable to start the estimation period for these models in 2002.

TVPI constraints

Abnormally high-performing funds with very large distributions generally result from idiosyncratic events; it is not expected that other funds would be systemically impacted. These funds should be treated as outliers as they tend to impact the stability and accuracy of the model calibration. In extensive testing we have found that the best calibration results come from removing funds with large values of the Total Value Paid In (TVPI), a measure computed as the ratio of total distributions to total investments (without discounting). Similarly, we have also found that very poor-performing funds, for which the distributions and valuation are substantially below the investments, should be treated as outliers. Thus, for inclusion in the estimation universe, a fund must meet a minimum and maximum TVPI requirement, depending on the fund category.

Minimum maturity of funds

For funds in the estimation universe that have not yet liquidated, we require that they have a minimum life span. The cash flow modeling used in the calibration assumes that these funds received a liquidation cash flow distribution at the end of the model calibration period based on the most recent reported fund net asset value (NAV). The minimum maturity criterion was put in place based on the observation that cash flows of a fund accurately capture fund returns only after a period of at least five years when the J-curve inversion occurs. This is supported by academic and practitioner research. Before five years, there are primarily investment cash flows with limited distributions; assuming a NAV liquidation distribution early in the fund's life gives highly idiosyncratic returns that are not representative of the overall systematic fund category return. For Venture Capital & Buyout, the minimum life required is seven years, as historically it has been seen that the NAVs evolve quite significantly up to the seven-year point. For real estate, debt and infrastructure, we have found that stabilization of returns based on NAV liquidation occurs after five years.

Limited distributions

One additional criterion for fund inclusion is applied in order to reduce the sensitivity of model calibration to manager-reported NAVs. For funds that have not yet liquidated and are reporting NAVs, the ratio of total distributions to total distributions plus NAV was computed. The bottom 5% as measured by this ratio of these funds was removed. In this way funds with low distributions relative to NAV are eliminated from the calibration process to mitigate potential NAV sensitivity.

Model methodology

A significant limitation of private funds is that there is no traded market from which market-consensus valuation and returns can be observed. For the purposes of deriving fund investment returns which can be combined with public market factor returns to build risk models, there are broadly two approaches in use. The first starts with quarterly fund NAVs as reported by the fund managers and through a process known as de-smoothing creates proxy returns of what the fund's performance might have been in a traded market. The second leverages observed fund cash flows for a set of funds over a history and seeks to estimate a time series of systematic returns for the set of funds that best fits the cash flows.

With the availability of verified cash flow data from CEPRES for a broad history of funds, we feel that returns estimated based on cash flows is the superior approach along several dimensions. While working with cash flow data requires a more complex model calibration methodology and higher quality data, the trade-off over a simpler approach is well worth the effort for these reasons:

1   Return frequency

NAVs are reported quarterly, but there is a well-known phenomenon that the most accurate reporting occurs in Q4. While models can be based on quarterly returns, often they are based on one-year returns (with quarterly overlap) to ensure the Q4 corrections are captured.

In contrast, if the set of funds is sufficiently large to provide frequent cash flows, the cash flow approach can be used to generate monthly historical returns and calibrate with monthly public factor returns.

AXIOMA

Analytics by Qontigo

Over 20 years of expertise in building risk models for risk analysis and portfolio construction; Axioma Factor Risk Models have become the industry standard since their inception in 2008.

2   Data quality

NAVs are a subjective manager-based view of a fund's valuation that incorporates views on potential future sales. As such, they may be overly optimistic. Of more concern for a risk model, however, is that NAVs also tend to be quite stable from quarter to quarter; hence the need for de-smoothing to artificially introduce volatility to correct for this effect.

Cash flows, on the other hand, are observable and verifiable, consisting of investment and distributions.

3   Fee adjustments

NAVs attempt to capture the value of fund investments in companies and other accounts. However, they typically do not account for any management fees, so that returns based on NAVs do not represent what an investor would actually see.

The returns computed from cash flows paid in and received by investors (i.e., net cash flows) represent exactly the investment return and do not require any fee adjustments.

Model delivery

The suite of Axioma Private Markets Factor Risk Models is available as a module in Qontigo's enterprise risk management platform Axioma Risk. Once a portfolio with data capturing fund position size and category is loaded into the platform, the positions are automatically mapped to the correct risk models and the portfolio risk analysis and decomposition can be computed. The private asset models are updated on a semi-annual basis to incorporate the most recent fund performance and cash flow data into the model calibration.

To learn more, email **partnerships@qontigo.com**

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To learn more about Qontigo, please contact us, or visit **qontigo.com**

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