

Private Equity Portfolio Cash Flow Forecast

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The Necessity for a Probabilistic Approach

Timing of realization is certain in the public market because it is at the choosing of the investor.

Private equity has no certainty at all.

<u>Timing</u>	<u>Amount</u>
→ Certain	Certain
→ Certain	Uncertain
▲ Certain	Uncertain
Uncertain	Uncertain
	Timing Certain Certain Certain Uncertain

The Necessity for a Probabilistic Approach



Because of the uncertain nature of cash flows in the private markets, our entire career as a team has been built around understanding the relative likelihood of a specific investment outcome or set of investment outcomes, whether in determining the amount and timing of the investment or the amount and timing of the return of the investment. We therefore express risk in terms of the likelihood of a specific outcome or set of outcomes. Everything we do is an attempt to quantify how much we do know versus how much we don't know about the cash flows related to private investments. We believe that we are one of the very few firms in the business that can provide a principled, coherent analytical tool set for that purpose. ACG's quantitative tools make it possible to match a portfolio's risk and return characteristics against the industry to arrive at an accurate cash flow forecast.





Quantitative Characteristics



Return (Benchmark)

Index comparison method (ICM) – return over a public market benchmark

		· ·	1	1 '	
					Index
	Cash		Cumulative	Index	Comparison
Period	flow	S&P	S&P	Comparison	Return
0	(\$100)				(\$100)
1	\$0	5.00%	1.050000	105.000	\$0
2	(\$300)	-10.00%	0.945000	394.500	(\$300)
3	\$0	-15.00%	0.803250	335.325	\$0
4	\$0	20.00%	0.963900	402.390	\$0
5	\$405	-10.00%	0.867510	(42.849)	\$405
6	\$0	5.00%	0.910886	(44.991)	\$0
7	\$0	15.00%	1.047518	(51.740)	\$0
8	\$0	25.00%	1.309398	(64.675)	\$0
9	\$200.	25.00%	1.636747	(80.844)	(\$81)
	\$205				× (\$76)
		1			

(using an end of period assumption)

Invented by the Alignment principals, now in general use.



Quantitative Characteristics Risk/Return Profile



OCOM Methodology*

- Determine regression line of outcomes



Quantitative Characteristics Risk/Return Profile



- OCOM Methodology* (cont.)
 - Calculate risk of private equity using knowns from public market

$$\frac{\beta_{vc}\sigma_{S\&P}^2}{r_{VC,S\&P}\sigma_{S\&P}} = \sigma_{VC}$$

Here, β is the slope and *r* is the coefficient of correlation of the OCOM plot and σ is the risk of the S&P 500 index over a particular time period.

* Patent pending

Quantitative Characteristics

Risk/Return Profile



By Strategy

				**		Calculated by Alignment Capital Group			
				1926-1987		1926-2000		1988-2000	
	S&P 500 arithmetic mean		0.1200		0.1298		0.1759		
		S&P 500 sigma		0.2110		0.2017		0.1508	
	_	S	harpe ratio		0.5687		0.6433		1.1662
	beta	alpha	R squared	σ	Sharpe	σ	Sharpe	σ	Sharpe
Example total portfolio	0.7839	0.0105	0.4282	0.2528	0.4137	0.2416	0.4644	0.1807	0.8213
	0 (205	0.0127	0.2(25	0.0000	0.4026	0.0120	0 4514	0.1500	0.7070
Example LBO	0.6385	0.013/	0.3625	0.2238	0.4036	0.2139	0.4514	0.1599	0.7878
Venture Economics LBO	(0.2184)	0.1175	0.0787	0.1643	0.5558	0.1570	0.5678	0.1174	0.6735
F 1 .	0 60 4 4	0.44.54	0.7006	0.4.40.4	1.0.550	0.1.100	1.0.550	0.40.60	
Example mezzanine	0.6044	0.1154	0.7286	0.1494	1.2579	0.1428	1.3572	0.1068	2.0760
Venture Economics mezzanine	(0.0939)	0.1123	0.1958	0.0448	2.2564	0.0428	2.3391	0.0320	2.9927
Example real estate	0.9257	0 1005	0.8258	0.2149	0 9844	0.2055	1 0738	01536	1 7139
Example leaf estate	0.7237	0.1005	0.0250	0.2147	0.7011	0.2033	1.0750	0.1550	1.7137
Example venture capital	1.3208	(0.0581)	0.6516	0.3452	0.2908	0.3300	0.3433	0.2468	0.7060
Venture Economics early VC	(0.0609)	0.1480	0.0085	0.1394	1.0091	0.1332	1.0513	0.0996	1.3776
Evenue belonced	1 7522	0.0020	0.0010	0.2017	0.7510	0.2744	• 0.9214	0.2000	1 4007
Example balanced	1.7555	0.0838	0.8919	0.3917	/ 0./510	0.3744	0.8314	0.2800	1.4007
Venture Economics Other VC	(0.0333)	0.1318	0.0044	0.1059 /	1.2065	0.1013	1.2590	0.0757	1.6634
					-				

Significantly out of line with industry history

Quantitative Characteristics

Risk/Return Profile



By Vintage

				*	*	Calculated by Alignment Capital Group			
				1926-1	1987	1926-2	2000	1988-2000	
	S&P 500 arithmetic mean		0.1200	\frown	0.1298		0.1759		
	S&P 500 sigma		0.2110	$\langle \rangle$	0.2017		0.1508		
	Sharpe ratio			0.5687		0.6433		1.1662	
	beta	alpha	R squared	σ	Sharpe	σ	Sharpe	σ	Sharpe
Example total portfolio	0.7839	0.0105	0.4282	0.2528	0.4137	0.2416	0.4644	0.1807	0.8213
1994	1.1836	(0.0167)	0.4018	0.3940	0.3181	0.3766	0.3634	0.2816	0.6799
1995	1.3762	(0.0781)	0.9194	0.3028	0.2874	0.2895	0.3471	0.2165	0.7574
1996	2.0623	(0.0107)	0.9394	0.4490	0.5274	0.4292	0.5986	0.3209	1.0970
1997	1.0541	0.0281	0.9159	0.2324	0.6652	0.2222	0.7422	0.1661	1.2853
1998	2.2273	0.1731	0.6418	0.5866	0.7507	0.5607	0.8241	0.4193	1.3471
1999	6.4091	0.9109	0.4761	1.9599	0.8572	1.8734	0.9301	1.4009	1.4549
2000	5.5613	0.7185	0.6972	1.4053	0.9861	1.3433	1.0720	1.0045	1.6890
2001	5.1160	0.4513	0.7856	1.2179	0.8746	1.1642	0.9579	0.8706	1.5521

Unusually consistent positive risk-adjusted performance





Quantitative Characteristics Portfolio Composition

ALIGNMENT CAPITAL





■ Balanced ■ Large LBO ■ Medium LBO ■ Mezzanine ■ Real Estate ■ Venture Capital

Quantitative Characteristics





* Patent pending

				Type IRR					
	Money	Time	Type by Fund Name	Total	Balanced	Large LBO	Medium LBO	Mezzanine	Venture Capital
Ι	Neutral Weight	Zero-based	Portfolio index, common start date	7.47%	12.85%	2.00%	9.22%	14.01%	-12.53%
Π	Actual	Zero-based	Actual weights, common start date	8.44%	-1.33%	5.49%	8.77%	10.63%	-12.66%
Ш	Neutral Weight	Actual	Neutral-weight portfolio, actual start dates (timing)	10.09%	18.61%	2.66%	13.63%	14.88%	-18.35%
IV	Actual	Actual	Actual weights, actual timing	10.97%	-1.98%	6.58%	11.53%	11.88%	-17.35%
		Ι	Portfolio index	7.47%	12.85%	2.00%	9.22%	14.01%	-12.53%
		II-I	Selection (relative weighting) against portfolio index	0.96%	-14.18%	3.48%	-0.45%	-3.39%	-0.13%
		IV-II	Timing	★ 2.53%	-0.66%	1.09%	2.76%	1.25%	-4.69%
		IV	Manager's return	10.97%	-1.98%	6.58%	11.53%	11.88%	-17.35%
		IV-I	Manager's contribution	<u>3.50</u> %	- <u>14.83</u> %	<u>4.57</u> %	2.31%	- <u>2.13</u> %	- <u>4.82</u> %
		IV-III	Selection (relative weighting) against actual outcome	0.88%	-20.59%	3.92%	-2.10%	-3.00%	1.01%

Overall selection return is positive, indicating a highquality portfolio.



- Note:
 - In the graphs on the following pages,
 - The gray banded areas represent typical industry performance over very long periods of time;
 - The red line in each graph represents portfolio performance through 2002;
 - The gold line is the base case, which takes the prior performance of the portfolio and current market conditions into account;
 - And the black and green lines are the worst and optimistic cases, respectively.



- A word about the cases
 - Assumptions common to all cases
 - Capital drawn in the future will not exceed remaining undrawn capital (i.e., capital commitments less capital already drawn).
 - The stochastic distributions used were derived from data in the Venture Economics database.
 - Except for the Base case, the stochastic distributions were derived from all data points of all vintages in the database.
 - Thus, funds with complete write-offs and funds not returning capital were considered, in addition to better-performing funds.



- A word about the cases
 - Base case
 - Probabilities of cash flows were extracted from vintages representing prior recoveries from industry troughs.
 - Venture capital: 1982 1987
 - Buyouts: 1986 1988, 1995 1997
 - Within these vintages, all funds were considered (including those with distinctly substandard returns)



- A word about the cases
 - Optimistic case
 - All vintages that have drawn capital at a faster than usual rate will slow down
 - All vintages that have drawn capital at a slow rate will continue to do so
 - All vintages that have returned capital more slowly than usual will speed up
 - All vintages that have returned capital quickly will continue to do so



- A word about the cases
 - Worst case
 - All vintages drawing capital at a rapid rate will continue to do so
 - Vintages drawing at a slower rate will speed up
 - All vintages returning capital faster than normal will slow down
 - All vintages returning capital at a slow rate will continue to do so.

Summary of Cases



- The base case assumes that the industry will recover from its current trough in about the same fashion as it has recovered from the prior two troughs.
- The optimistic case assumes an immediate return to the mean for the industry and portfolio as a whole.
- The worst case assumes that there will be no return to the mean and requires a global macroeconomic upheaval possible, but in our view extremely unlikely.



\$300

\$250 \$200

\$50

\$-

In Millions \$150 \$100

• Although capital drawn in the portfolio accelerated in 2000...



------Worst

Optimistic

Base

Pessimistic

Actual

... cumulative actual draws are about on track, with the base and optimistic cases spot on.

Cell

Actual

Pessimistic

Mean

Draws



• Actual return of capital, on the other hand, is badly off track...

Cumulative ROC



ROC



 ...although an adequate return is still highly probable.



• Positive net cash flow is anticipated to be later, and probably less than usual, for this portfolio...





NCF

• ...but cumulatively it is very highly probable that the portfolio will recover invested capital.

Return of Capital



Portfolio Base Case (the gold line in the previous graphs)



Note that there is no measurable risk of returning < \$500 million.

Return of Capital



Portfolio Optimistic Case (the green line in the prior graphs)



in the optimistic case.

Return of Capital



Portfolio Worst Case (the black line in the previous graphs)



Even in the worst case, the probability of < \$500 million return of capital is under 1%, with the minimum observed of \$382.3 million.

Conclusion



- Our stochastic analysis suggests that the example portfolio has a very high probability of returning \$500 million or more between now and 2011 (worst case probability of 98 bps of not doing so).
- Our qualitative and quantitative review of the portfolio indicates that this is a well chosen, well diversified portfolio of fund managers. In light of these factors and the industry's demonstrated ability to recover from prior troughs, we believe that the worst case scenario should have no more than a 5% probability. Therefore we believe that in the worst case there is no more than a 5 bps probability of not returning \$500 million.