

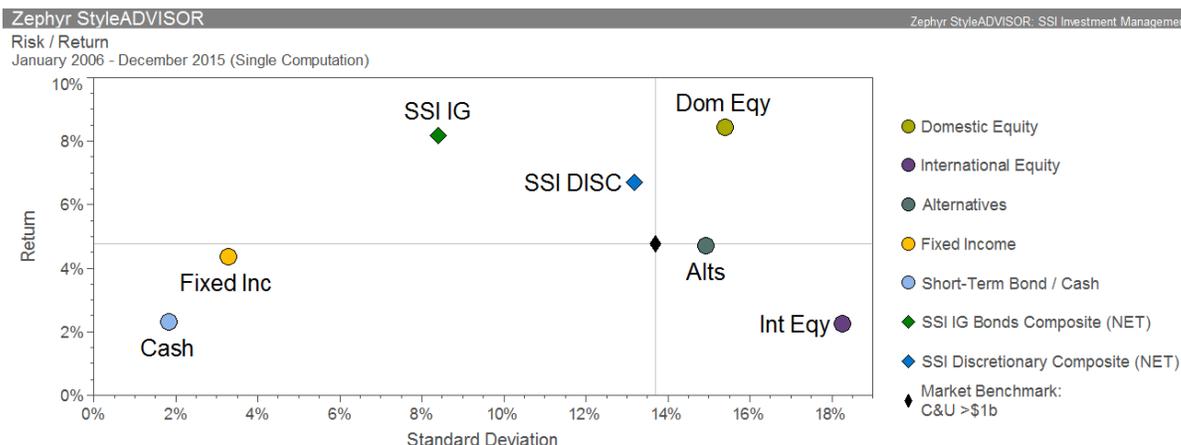
How SSI Convertibles Fit in Educational Endowment Portfolios

Convertible securities are often used to improve the overall risk/return profile of a broad investment portfolio. Their combination of fixed income and equity-like attributes can make convertibles an attractive alternative to conservative equity, high yield, or alternatives allocations. Using data from the 2015 NACUBO1-Commonfund Study of Endowments, which analyzes several hundred U.S. college and university endowment portfolios, SSI analyzed the impact of adding an allocation of SSI Convertibles to a typical Endowments portfolio. This white paper discusses the results of these studies.

The NACUBO-Commonfund study breaks down college and university endowments into six categories, based on market value (see table below). This study shows that five major asset classes are represented in the typical U.S. College & University endowment: *Domestic Equities*, *International Equities*, *Fixed Income*, *Alternative Strategies*, and *Short-Term & Cash securities*. Large endowments tend to put more money in the alternatives bucket and less into domestic equities, while allocations for small endowments seem to do the opposite. This could be due to anything from prohibitive fee structures to required rate of return. Average allocations are as follows:

Size of Endowment	Domestic Equities	Fixed Income	International Equities	Alternative Strategies	Short-term / Cash / Other
Over \$1 Billion	13%	7%	19%	57%	4%
\$501 Million to \$1 Billion	21%	9%	20%	44%	6%
\$101 Million to \$500 Million	27%	13%	21%	34%	5%
\$51 Million to \$100 Million	33%	17%	20%	25%	5%
\$25 Million to \$50 Million	40%	20%	18%	16%	6%
Under \$25 Million	42%	24%	15%	11%	8%

Below is a risk/return plot of these five major allocation categories, with both SSI Composites (Discretionary & Investment Grade Convertibles, net of fees) and the typical > \$1 Billion endowment portfolio as the 'benchmark', for comparison. Both SSI convertible products stand out as comparatively attractive, with Investment Grade especially being a standout risk adjusted performer.



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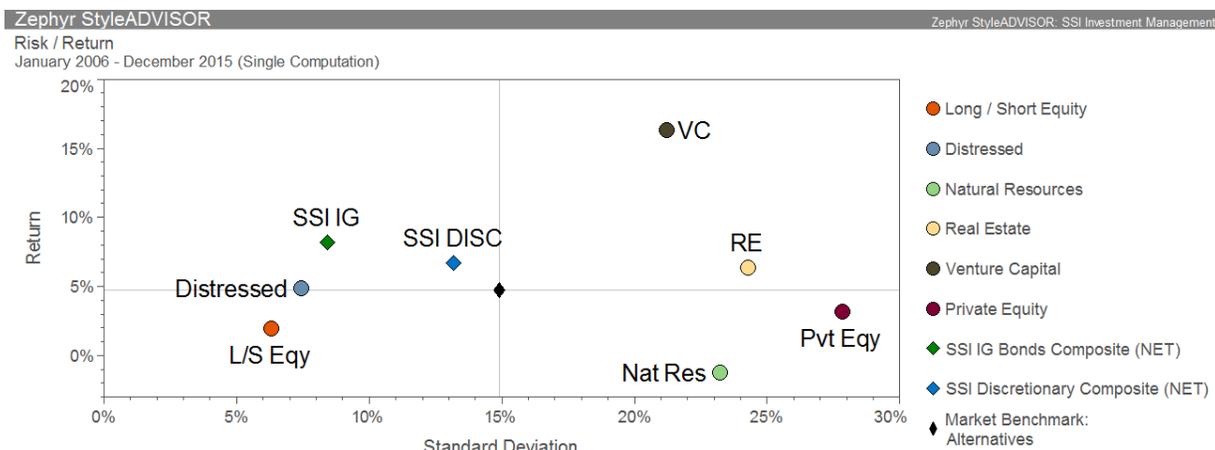
For the purposes of this paper, the following products were used as representative assets. Where possible, net-of-fee fund products were used, but in a few instances in the alternatives space, indices had to be utilized (i.e. for private equity). The goal was to make certain that each asset had at least ten continuous years of return streams, and that the resulting performance should represent a portfolio's realized return after all fees are paid.

Typical College/University Endowment Assets		min	max
Short Term / Cash	Morningstar Short-Term Bond funds	2%	10%
Fixed Income	iShares Core US Aggregate (AGG)	5%	25%
Domestic Equities	JPMorgan US Equity Fund (JMUEX)	10%	45%
International Equities	Wells Fargo International Equity Fund (WFENX)	15%	30%
Alternatives	average C&U Endowment mix *	5%	60%

SSI Convertible Products
SSI IG Composite (net)
SSI Discretionary Composite (net)

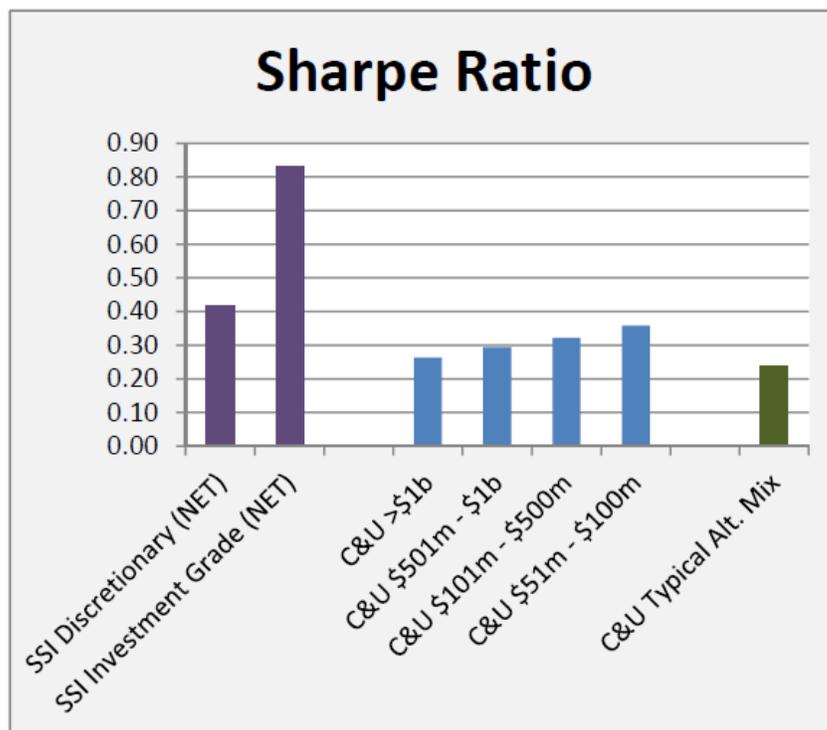
* Alternatives Allocation	Average C&U Endowment mix:
Long/Short Equity	Morningstar Long/Short Equity funds 40%
Private Equity	LPX Direct Listed Private Equity index 21%
Natural Resources	Morningstar Natural Resources funds 13%
Real Estate	Morningstar Real Estate funds 12%
Venture Capital	Thomson Reuters Venture Capital index 11%
Distressed	HFN Distressed index 3%

As can be seen in the blue table above, four out of the five major asset class categories are easily replicated, but for the "alternatives" bucket, there is no single fund that encapsulates the typical alternatives strategy. As such, the average endowment's allocation to six alternative categories was used (see the green box above), with the largest allocation typically going to Long/Short Equity. Since the size of the total endowment portfolio has a large impact on the size of the allocations within the alternative bucket, SSI took the institutional average allocation seen above, which came from the NACUBO-Commonfund study. Below is another risk/return plot with these six alternatives categories, again compared with both SSI Composites (Discretionary & Investment Grade Convertibles, net of fees) and including the average alternatives asset mix shown as a 'benchmark'. Convertibles appear to compare favorably once again.



How SSI Convertibles fit in Educational Endowment Portfolios

As the two previous risk/return charts have illustrated, both SSI Composites (Discretionary & Investment Grade, net of fees) have superior risk adjusted returns versus the typical > \$50 Million endowment as a whole, as well as having better risk adjusted returns than the average 'alternatives' bucket within an endowment portfolio. This is historically evidenced by looking at Sharpe ratios over the last ten years (the maximum time frame examined in the 2015 NACUBO-Commonfund study). Again, while SSI's Investment Grade convertibles are the real standout product, both SSI convertible composites have favorable risk adjusted returns when compared to the current asset mixes found in typical college and university endowments.



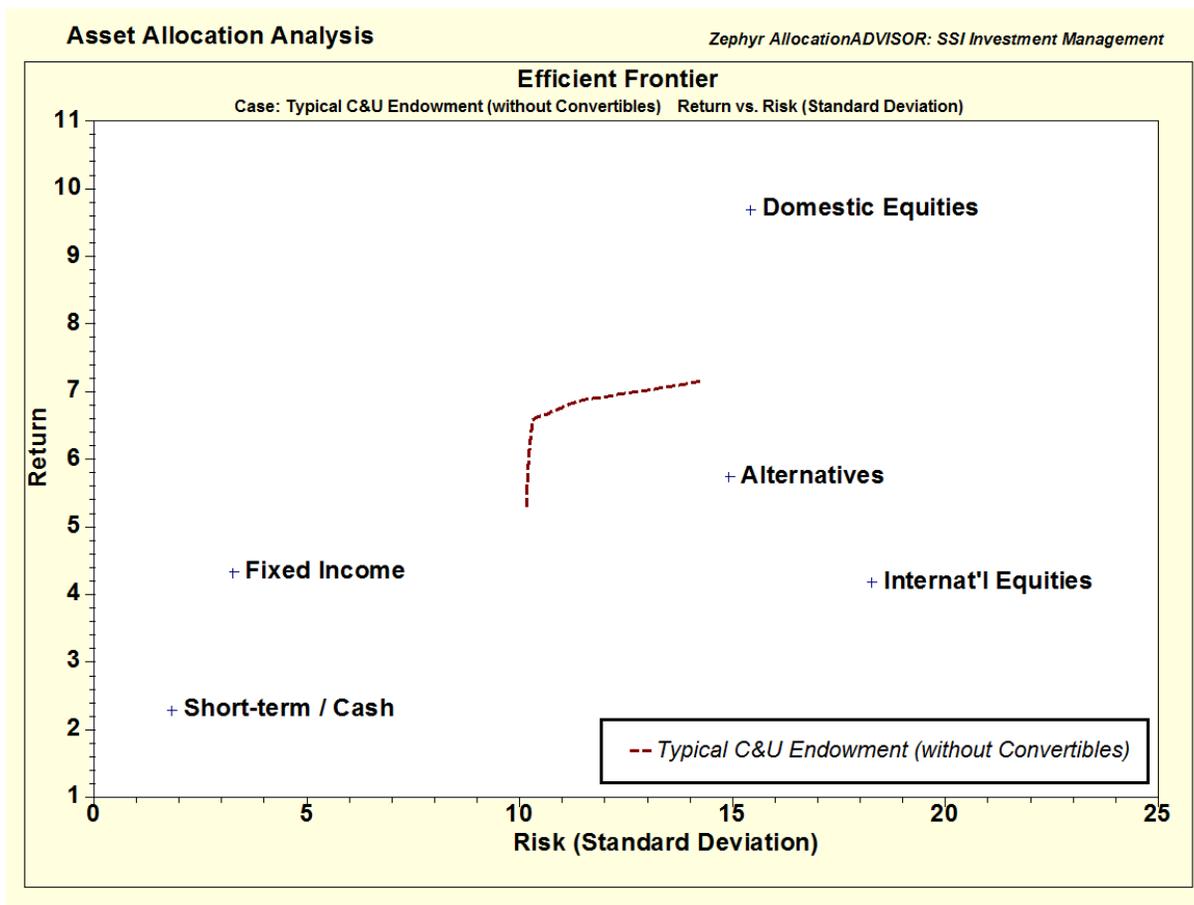
Trailing 10-Year, as of 12/31/2015

Thus far, it appears that convertibles could be a benefit to the typical educational endowment portfolio, from a risk/return perspective. Now that each of the assets that typically make up an endowment have been examined, it is necessary to assess the impact of adding convertibles as an allocated asset within an endowment portfolio. This can be accomplished through constructing efficient frontiers.

The blue table on the previous page (p. 2) shows the range of allocations to each of the five major asset classes, which are highly dependent on the size of the endowment. As previously mentioned, larger endowments tend to allocate more to the alternatives bucket and less to domestic equities and fixed income, while small endowments typically allocate in the opposite manner. Using the minimum/maximum range of allocations from the blue table on the previous page, an efficient frontier can be constructed which represents the wide range of educational endowments.

How SSI Convertibles fit in Educational Endowment Portfolios

The chart below shows the efficient frontier on which a typical college and university endowment lies. Positioning on the frontier is dependent upon the allocation to each of the five major asset groups within an endowment portfolio, which we have shown is tied to the total size of the endowment.

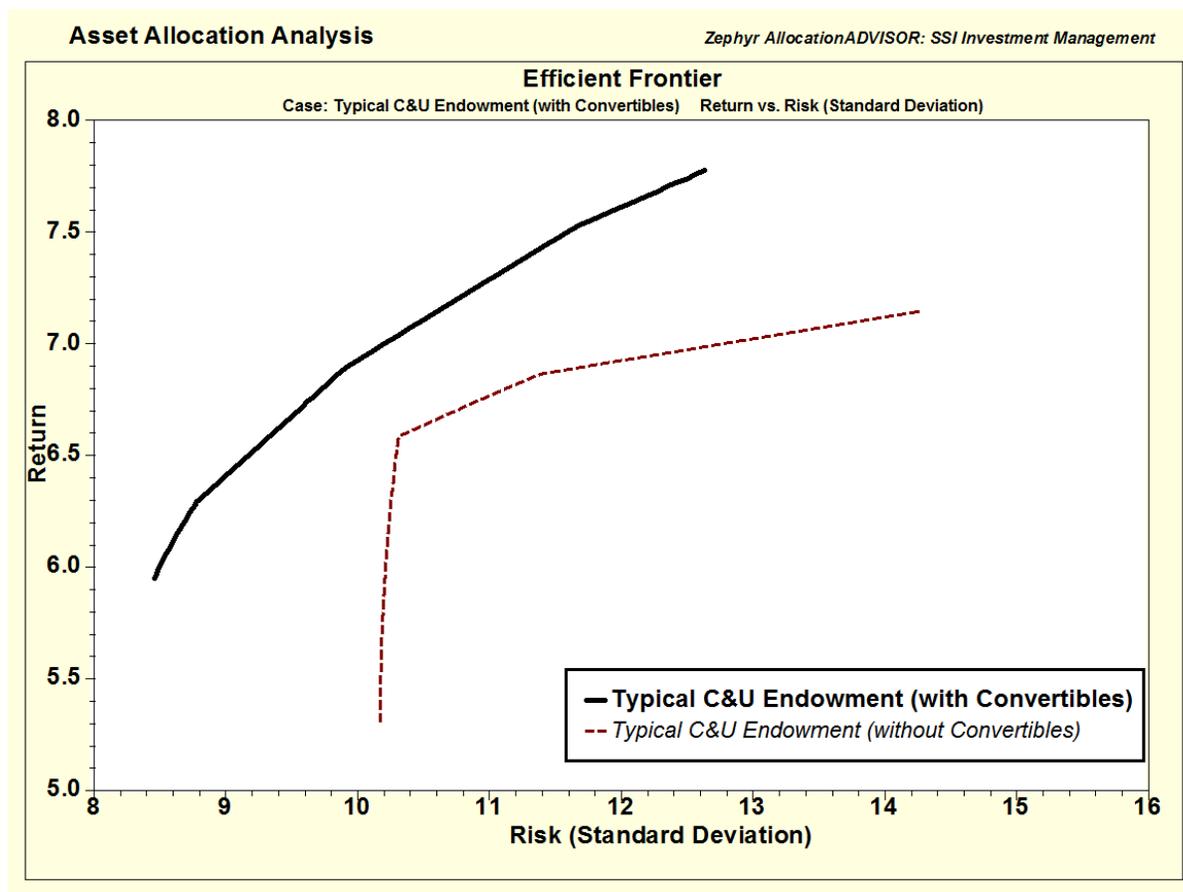


Trailing 10-year, as of 12/31/2015

Now that the efficient frontier for a typical endowment portfolio has been built, the final step is to determine the impact of adding an allocation to convertibles. For the purposes of this study, both SSI Discretionary and Investment Grade composites, net of fees, were used to represent convertibles managers. As with the rest of the assets in this study, each SSI convertible product was assigned a minimum/maximum allocation range, from 0-20% of the total endowment portfolio. Based on the data that has been presented thus far in this study, one would expect a positive overall impact from adding convertibles to an educational endowment portfolio, given the favorable risk/reward profile that convertibles exhibit.

How SSI Convertibles fit in Educational Endowment Portfolios

Using the discussed minimum/maximum ranges for SSI convertibles within an educational endowment portfolio, a new efficient frontier was constructed. The results are shown below.



As expected, there is meaningful improvement to the existing range of endowment portfolios by adding convertibles. The graph also indicates improvements can range from +100 bps increased return to -200 bps reduced risk (as measured by standard deviation), a strong argument for the inclusion of SSI convertibles within a college or university endowment portfolio. While both SSI composites improve the risk/return profile of a typical college or university portfolio, SSI's Investment Grade product gets a higher recommended weighting than the fully Discretionary strategy, regardless of where one wants to sit on the efficient frontier. This is because of the standout risk/return profile of SSI's Investment Grade convertibles product, which allows for an allocation to below-IG convertibles but maintains an overall investment grade average rating.

The higher recommended relative weighting in SSI Investment Grade convertibles is due to the fact that the return profile of SSI Discretionary Convertibles more closely resembles assets that already exist within the typical educational endowment portfolio (somewhere between alternatives and domestic equity, albeit with an improved Sharpe ratio), while SSI Investment Grade presents an optimal risk reward profile that stands separate from the rest of the asset mix. It follows that the typical college or university endowment portfolio could benefit from adding a blend of SSI Investment Grade and Discretionary convertible products, with a higher weighting on the Investment Grade portion of the portfolio.



Ethan Ganz

Associate Portfolio
Manager

12 Yrs. Experience

¹The National Association of College and University Business Officers (NACUBO).

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- Headquartered in Los Angeles, CA
- Founded in 1973
- 13 Investment Professionals
- 100% Employee Owned
- \$1.3 Billion AUM
- 36 Employees

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Compliance Statement

SSI Investment Management, Inc. ("SSI") claims compliance with the Global Investment Performance Standards (GIPS®).

Definition of the Firm

SSI was established in 1973 and is a Registered Investment Advisor based in Los Angeles, CA. SSI manages assets in domestic and global capital markets. SSI acquired the assets of Frolely, Revy Investment Co., Inc. ("Frolely Revy") and its composites as of March 1, 2009. SSI is 100% employee owned and is not affiliated with any parent organization nor does SSI have any subsidiaries. SSI applies quantitative disciplines and fundamental research in its management of alternative and traditional portfolios for institutional and high net-worth investors. SSI manages separate accounts, limited partnerships and acts as sub-advisor to both onshore and offshore funds.

Policies

SSI's policies for valuing portfolios, calculating performance, and preparing compliant presentations is available upon request.

The Composite & Benchmark

The Outright Discretionary Convertible Strategy (composite created January 1983) is invested in convertible bonds and convertible preferred stocks, and do not have credit quality restrictions. The Strategy may hold 144A securities. The composite contains fully discretionary accounts including those no longer with the firm. SSI believes a performance comparison versus the BofA Merrill Lynch All Convertibles Index (the "VXA0") is appropriate. The VXA0 measures the return of all U.S. convertibles. SSI does not hold all convertibles in the VXA0 and may also hold convertibles that are not included in the VXA0. The Strategy is less diversified than the VXA0. The volatility of this strategy may be greater than the volatility of the VXA0 as the strategy holds a smaller number of positions than the Index. The return, if any, above the VXA0 is dependent upon SSI's discretionary management. Any other indices shown are not necessarily comparable to SSI's Outright Discretionary Convertible Strategy. These are widely recognized market indices that are shown for informational purposes only.

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Returns are presented gross and net of management fee. Actual results of an individual account may be materially different from the performance shown herein because of differences in inception date, transaction and related costs, restrictions, fees and other factors. All performance is based in U.S. dollars and reflect, on a percentage basis for each of the periods indicated: (a) the net increase (decrease) of all SSI Outright Discretionary Convertible Strategy portfolios, dollar-weighted, including adjustments for unrealized gains and losses, the reinvestment of dividends and other earnings, the deduction of investment costs except any separate custodial or related fees, time-weighted to adjust for additions and withdrawals, and (b) the net increase (decrease) of the VXA0.

Net performance is reduced by SSI's *actual* investment management fees. Gross performance does not include deduction of SSI's investment management fees.

If performance is gross of management fees, client's actual return will be reduced by the management fees and any other expenses which may be incurred in the management of an investment advisory account. See SSI's Form ADV, Part 2A for a complete description of the investment advisory fees customarily charged by SSI. As an example, an account with an initial \$1,000,000 investment on January 1, 2003, earning a recurring 5% semi-annual gross return (10.25% annualized), and paying a .5% semi-annual management fee (1% annual fee) would have grown to \$1,340,096 on a gross of fees basis and \$1,300,392 on a net of fees basis by December 31, 2005 (3 years).

List of Composites

A list of the Firm's composite descriptions and/or compliant presentations are available upon request. Please contact juliea@ssi-invest.com.

Additional Disclosure

Preliminary performance as of January 31, 2016.

SSI acquired Frolely Revy and its composites as of March 1, 2009. Prior to the acquisition, Frolely Revy claimed GIPS compliance for the periods of 1983-2008 and was independently verified by Ashland Partners & Co.

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