# Asset-capacity study for Turner's stock portfolios

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Turner investment partners

**Summary for 2009**

A plunging stock market and a decline in market liquidity has resulted in a significant reduction -- about a 50% decrease -- in the asset-capacity limits for Turner Investment Partners' 23 primary stock portfolios. As such, we think the new limits are unusually low and may require an upward revision if market conditions and liquidity improve later this year.

The asset limits are calculated in two ways: individually and collectively. When an individual portfolio reaches its own particular limit, it will be closed to new investors. And when a particular group of portfolios reaches its collective asset limits, all portfolios in that group will be closed.

With the exceptions of four portfolios already closed, most of our portfolios remain able to comfortably absorb additional assets for years to come without impairing their performance; most of our portfolios -- and groups of portfolios -- are well within their asset limits.

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Investment research has confirmed an inverse relationship between the size of assets under management and investment performance -- that is to say, the larger a stock portfolio's asset base, the more deleterious the effect on performance.

At Turner Investment Partners, we have developed a methodology to measure the maximum asset capacity of our stock portfolios (the largest amount of assets that they can accept and still efficiently execute their investment strategies and retain their potential to outperform). In this study we have investigated and updated the asset-capacity limits for our 23 primary institutional stock portfolios (and their corresponding mutual funds) and for our portfolios in groups. The groups were classified according to 11 broad classifications, based on market-capitalization segment and investment style. In practical terms, what this means is that when the asset limits for a particular portfolio or group of portfolios are reached, that portfolio or *all* portfolios in that group will be closed to new investors -- even if *none* of the individual portfolios in that group have yet to touch their own particular limits. In all, we think the asset limits for both individual portfolios and groups of portfolios should continue to enable us, when the need arises, to close our portfolios efficiently and flexibly.

**Our holdings often overlap**

We set capacity limits for groups of portfolios in the first place because some of the holdings in those groups of portfolios are similar. Put another way, the overlap in holdings for specific groups of portfolios is, and always has been, high. For example, a certain portion of a mid-cap portfolio may be invested in small-cap and large-cap stocks that are the province of small-cap and large-cap portfolios. Such overlapping has implications for the calculations of the asset capacity of a portfolio. So if a mid-cap portfolio, say, has a 20% overlap with a small-cap portfolio, the gross capacity of the mid-cap portfolio is thus reduced by 20% of the gross capacity of the small-cap portfolio.

As you may know, the stock-market, as represented by the S&P 500 Index, was down 37% last year. At the same time, the stock market's liquidity declined by about 10%. Together, those two developments have led to a significant reduction -- about a 50% decrease -- in the asset capacity limits for our portfolios for 2009. It should be emphasized that these new asset limits represent a snapshot of market conditions as of December 31, 2008. This snapshot depicts asset limits that we consider abnormally low at this juncture -- the result of the extreme downward pressure that the market has been subjected to lately. Should stocks rally and liquidity increase subsequently, we would then expect to adjust the limits upward at some point in 2009 to reflect the new market reality.

Also, as was the case last year, we calculated the individual asset limit for each portfolio based on

its *gross* capacity -- a calculation that assumes the portfolio stands alone, with no consideration given to the commonality of holdings it shares with other portfolios in the group.

### Why size does matter

As noted, the size of a stock portfolio is inversely related to its investment performance, with bigger size equating to worse performance. Just why does the size of any stock portfolio matter?

Perhaps this question can best be answered with an example:

Assume two portfolio managers with similar investment styles each own 100 stocks in their portfolios. Assume each attempts to buy a 1% portfolio position in the same stock that was selling at a price of $20 per share (trading an average of 450,000 shares per day) when the issuing company announced positive news. Assume that the price rises over the next five days following the announcement. Most importantly, assume that one manager's portfolio has *$100 million* in assets, and the other manager's portfolio has 10 times that amount, or *$1 billion*.

The manager with the $100 million portfolio is able to build a 1% position in *one* day. Assume he purchased 45,000 shares (representing 10% of the stock's average daily trading volume) at an average price of $22.22. In contrast, the manager with the $1 billion portfolio was compelled to buy the stock over *five* days to achieve a 1% position. That manager bought 408,000 shares (amounting to 18% of the stock's average daily volume) at an average price of $24.50. Due to his superior trading efficiency, the first manager -- the manager of the smaller portfolio -- is able to gain 10 basis points of outperformance in that stock relative to the second manager running the larger portfolio.

If both managers average about 100% annual turnover in holdings and if the first manager continues to execute most trades in one day, he may outperform the manager with the larger portfolio by as much as 10 percentage points in the course of a year, in our analysis.

As that example shows, the time needed to build (or eliminate) positions in a portfolio directly affects that portfolio's results. *And the time required to build or eliminate positions is directly related to the size of the portfolio's assets.* The larger the size of the assets, the longer it takes to buy and sell stocks -- and the higher the execution and opportunity costs.

### How we measure asset capacity

As noted, at Turner we define maximum asset capacity as the largest amount of assets in a stock portfolio that permits us to execute the investment strategy efficiently and reasonably quickly. We measure capacity in millions or billions of dollars for each portfolio according to the following formula:

*Portfolio capacity* = (S * DV * D * V) / (1 - C).

Here are the individual formula components:

- S -- the average number of securities held in the portfolio;
- DV -- the weighted average daily dollar volume of all stocks traded in the applicable universe;
- D -- the maximum number of days required to build and eliminate positions without compromising the investment strategy's potential alpha;
- V -- the maximum percentage of the average daily volume that can be traded without materially affecting the stock price;
- C -- the percentage of the portfolio typically held in cash.

### How we determine liquidity

The most important factor in determining a stock portfolio’s maximum asset capacity is the true liquidity (DV, or dollar volume) available for that portfolio. It is one of five elements that

***Liquidity matrix by sector/market-cap range***
December 31, 2008
(Dollar amounts in millions)

| *Market-cap range $* | *Autos/ transport.* | *Consumer discretionary* | *Consumer staples* | *Energy* | *Financial services* | *Health care* | *Materials/ processing* | *Producer durables* | *Technology* | *Utility* |
|---|---|---|---|---|---|---|---|---|---|---|
| >=100B | $90.22 | $1,901.43 | $730.26 | $728.31 | $124.36 | $481.17 | $144.91 | $2,223.13 | $1,530.81 | $424.81 |
| >=30B and <100B | 147.75 | 267.01 | 226.20 | 268.28 | 511.87 | 279.88 | 288.20 | 226.02 | 1,117.94 | 141.29 |
| >=10B and <30B | 176.85 | 152.64 | 92.85 | 252.29 | 132.81 | 155.08 | 208.21 | 122.53 | 288.87 | 50.96 |
| >=5B and <10B | 62.77 | 59.84 | 52.10 | 172.36 | 69.17 | 77.62 | 104.98 | 60.94 | 57.32 | 35.08 |
| >=2B and <5B | 53.33 | 61.23 | 35.71 | 58.25 | 42.95 | 49.67 | 57.99 | 46.73 | 60.66 | 25.08 |
| >=1B and <2B | 25.29 | 26.21 | 13.82 | 35.20 | 23.85 | 22.56 | 25.71 | 21.62 | 20.06 | 13.30 |
| >=600M and <1B | 19.52 | 11.87 | 10.40 | 11.54 | 10.13 | 9.19 | 11.75 | 10.85 | 11.91 | 6.85 |
| >=300M and <600M | 8.64 | 6.13 | 3.72 | 7.77 | 4.52 | 5.75 | 5.61 | 5.59 | 5.08 | 2.69 |
| <300M | 2.30 | 2.12 | 1.11 | 2.89 | 0.90 | 1.53 | 1.80 | 2.16 | 1.47 | 0.85 |

determine capacity -- but it is an element that the portfolio manager has no control over. Calculating the dollar liquidity of any domestic stock portfolio involves these three steps:

*First*, we divide the U.S. stock market (excluding ADRs) into a matrix of 10 market sectors and nine market-capitalization segments. The resulting matrix includes 90 distinct classifications of securities, including stocks that traded at least $1 million in volume daily on average in the previous three months.

For each of the 90 classifications, we calculate the average daily dollar volume that all applicable stocks traded in the previous three months (or about 63 trading days). For example, we determined that the average daily dollar volume (the average of shares multiplied by the share price each day) of stocks in the health-care sector with market capitalizations between $10 billion and $30 billion was $155.08 million for the period ended December 31, 2008.

*Second*, we determine the distribution of the portfolio among the 90 classifications of market sectors and market-capitalization segments. For example, 4.1% of the Turner Large Cap Growth Equity portfolio was invested in health-care stocks with a market-cap range of $10 billion-$30 billion as of December 31, 2008.

*Third*, we multiply the portfolio's exposure to a classification by the dollar liquidity available to that classification. (For example, the average liquidity of the health-care stocks in the range of $10 billion-$30 billion is $155.08 million per stock a day. We multiply that number by the exposure of the portfolio to that classification -- in the case of our Large Cap Growth portfolio, $6.37) The total, when added up for all 90 classifications, is the weighted average liquidity of the portfolio at year-end. For our Large Cap Growth portfolio, for instance, we determined that the average dollar liquidity as of year-end was $447.6 million per stock per day.

Of course, the liquidity value differs for each portfolio, based on the unique exposure of the portfolio to the liquidity available in each of the 90 sector/market-cap classifications. (See the above table, *Liquidity matrix by sector/market-cap range*, for more details on liquidity.)

**Five elements affect capacity**

As noted, one of the five elements in determining a portfolio's asset capacity -- true liquidity -- is beyond the control of the portfolio manager. But the other four elements *can* in fact be controlled. *Specifically, the manager can determine how many securities on average are held in a portfolio, how many days are needed to build or eliminate positions, what portion of the average daily volume in a stock should be tapped, and how much cash should be held in the portfolio.* As a result a manager can develop a sensitivity matrix to determine the impact that changing any of the four elements will have on a portfolio's maximum asset capacity.

For example, at Turner we apply conservative assumptions to determine asset capacity. We

believe the Turner Large Cap Growth Equity portfolio should hold only 40-50 stocks that represent our best investment ideas. We believe that we should build or eliminate our positions in that portfolio in six trading days or less and that we should not tap into more than 10% of the average daily volume of the stocks that we trade.

As a result we calculated the maximum asset capacity for the Turner Large Cap Growth Equity portfolio to be $13,550 billion, as of December 31, 2008, in this way:

(50 securities * 6 days * 10% of volume * $447.6 million)/(1-1% cash) = $13,550 billion.

Note that if the number of stocks in our Large Cap Growth portfolio were increased to 100 and if we chose to build or eliminate positions over a longer time span, in 18 trading days or less, the portfolio's capacity would grow almost sixfold, to more than $81,400 billion:

(100 securities * 18 days * 10% of volume * $447.6 million)/(1-1% cash) = $81,400 billion.

(We hasten to add that adopting such a portfolio-management practice -- increasing the number of holdings and taking more time to build or eliminate positions -- would likely impair the investment performance of our Large Cap Growth portfolio, lessening its ability to outperform, according to our research.)

Assuming that we typically hold 1% in cash in our portfolios, that we typically build and eliminate positions in six days or less, and that we typically tap 10% or less of the average daily volume of the stocks traded, we present our asset-capacity limits for both individual portfolios and groups of portfolios by investment style and capitalization segment for 2009 on pages 5 and 6.

### Our conclusion

Turner's primary mission is to deliver consistently superior investment performance to clients. We strongly believe we have a thoughtful, time-tested investment philosophy, approach, and process that can lead to outperformance. A key to outperformance, however, is to prevent portfolio assets from growing too unwieldy to manage.

By not exceeding the maximum asset-capacity limits that have been defined for all of our growth, international/global, core/value, and quantitative portfolios, we should be better able to execute our investing processes and continue to offer significant potential for outperformance. Since the early days of our firm, we've believed that it's in the best interests of clients to close our portfolios when their assets reach a certain predetermined size -- a size established by in-depth research. Because portfolios can in fact be too big for their own -- and clients' -- good.



Turner Investment Partners, founded in 1990 and based in Berwyn, Pennsylvania, is an investment firm that manages more than $15 billion in stocks in separate accounts and mutual funds for institutions and individuals, as of December 31, 2008.

## *Asset-capacity summary for Turner Investment Partners' stock portfolios: 2009*

(Dollar amounts in millions)

| | ***2009 capacity range*** | *2008 capacity range* |
|---|---|---|
| *Large-cap growth portfolios* | | |
| **Turner Concentrated Growth Equity** | **$5,300-6,350** | $9,950-11,950 |
| **Turner Core Growth Equity** | **12,400-13,350** | 21,800-23,500 |
| **Turner Growth Equity** | **12,150-13,100** | 23,500-25,300 |
| **Turner Large Cap Growth Equity** | **12,200-13,550** | 22,700-25,200 |
| **Total, large-cap growth group** | **$16,600-18,100** | $31,100-33,600 |
| *Small and mid-cap growth portfolios* | | |
| **Turner Midcap Growth Equity** | **$3,600-4,150** | $6,050-7,050 |
| **Turner Small Cap Growth Equity *** | **1,850-2,300** | 2,550-3,200 |
| **Turner Small Cap GrowthPlus Equity** * | **1,100-1,400** | 1,650-2,100 |
| **Total, small and mid-cap growth group** | **$5,200-6,400** | $8,100-10,000 |
| *Micro-cap growth portfolio* | | |
| **Turner Micro Cap Growth Equity *** | **$700-850** | $950-1,150 |
| *Quantitative large-cap portfolios* | | |
| **Turner Quantitative Broad Market Equity** | **$19,100-21,000** | $26,100-28,700 |
| **Turner Quantitative Large Cap Growth Equity** | **14,750-16,250** | 25,550-28,150 |
| **Turner Quantitative Large Cap Value Equity** | **15,300-17,200** | 22,800-25,650 |
| **Total, quantitative large-cap group** | **$32,400-35,800** | $49,100-54,300 |
| *Quantitative micro-cap portfolio* | | |
| **Turner Quantitative Micro Cap Equity *** | **$300-350** | $300-350 |

* Closed to new investors

### *Asset-capacity summary for Turner Investment Partners' stock portfolios: 2009*

(Dollar amounts in millions)

| | ***2009 capacity range*** | *2008 capacity range* |
|---|---|---|
| *Quantitative mid-cap portfolios* | | |
| **Turner Quantitative Midcap Growth Equity** | **$4,150-4,900** | $5,850-6,900 |
| **Turner Quantitative Midcap Value Equity** | **3,200-3,800** | 5,500-6,600 |
| **Total, quantitative mid-cap group** | **$6,100-7,200** | $9,400-11,100 |
| *Quantitative small-cap portfolios* | | |
| **Turner Quantitative Small Cap Growth Equity** | **$950-1,100** | $1,550-1,800 |
| **Turner Quantitative Small Cap Value Equity** | **800-950** | 1,100-1,300 |
| **Total, quantitative small-cap group** | **$1,500-1,800** | $2,300-2,700 |
| *Mid-cap core/value portfolios* | | |
| **Turner Midcap Core Equity** | **$2,750-4,000** | $3,800-5,450 |
| **Turner Midcap Value Equity** | **2,000-2,950** | 2,400-3,600 |
| **Total, mid-cap core/value group** | **$3,700-5,400** | $4,800-7,000 |
| *Small-cap core/value portfolios* | | |
| **Turner Small Cap Core Equity** | **$1,500-1,900** | $1,600-2,000 |
| **Turner Small Cap Value Equity** | **1,000-1,450** | 1,050-1,500 |
| **Total, small-cap core/value group** | **$2,000-2,500** | $2,100-2,600 |
| *ADR portfolio* | | |
| **Turner International Growth ADR Equity** | **$2,000-2,850** | $1,950-2,700 |
| *International/global growth portfolios* | | |
| **Turner Global Growth Equity** | **$8,900-10,950** | $15,450-18,650 |
| **Turner International Growth Equity** | **5,050-7,950** | 7,000-11,000 |
| **Total, international/global group** | **$9,600-13,600** | $15,500-21,300 |