

## Disciplined To Seek Alpha

*Oddly enough, investors repeat mistakes again and again. Through financial models, a quantitative approach makes behavior patterns of investors evident to these models whether it is in a sector or in a stock. James Johnson exploits arbitrage opportunities through disciplined, quantitative fund management.*

**Q: What is your investment philosophy?**

**A:** We believe that stock prices are driven by investor behavior. There are persistent mispricings in the marketplace that can be exploited through quantitative techniques. We believe that academic and internal research supports our view.

**Q: What are the key elements of your investment process?**

**A:** Stock and market research is a critical component of our investment process and it is purely quantitative in nature as you might tell by the name of the fund. We are looking for companies with attractive relative valuations and the ability to support future growth with high quality earnings and a solid outlook for growth. We believe that if we identify those types of companies and overweight them relative to our benchmark, we are going to add value relative to that benchmark over time. This approach involves bottom-up stock selection based on multiple perspectives or core quantitative models.

We break our core quantitative model into three components - a valuation component, a quality component and a sentiment component. We look for companies with attractive valuations and that is the valuation component. The quality component addresses the quality of earnings. The sentiment component addresses the ability of that company to support solid growth in the future.

**Q: How do you arrive at the opinion for each stock using these models?**

**A:** Since our process is quantitative in nature, we rely on our financial models. Every day the models are run and we get our financial data from publicly available sources including financial statements, earnings estimates, stock prices and other technical and fundamental data. Each stock in our universe is given a ranking for each of these models, and we have a weight that we apply to each of the models that sums up to a single opinion for each stock. We sort that universe from top to bottom and we select our stocks from that list.

**Q: How many stocks have you got in your universe?**

**A:** Our investable universe encompasses all large cap US stocks. It equates to roughly 1,100 stocks, and that number changes over time, but it includes the S&P500, the Russell 1000 and a few other stocks with large market caps.

**Q: What is the rationale behind these financial models?**

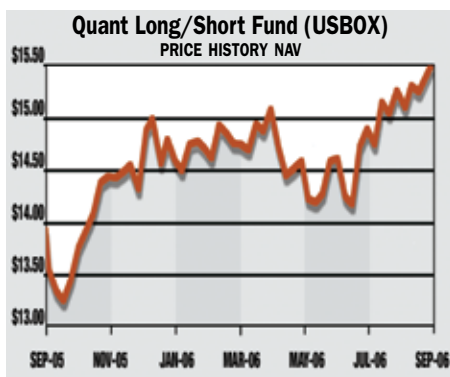
**A:** The rationale behind quantitative models is that we are able to take an enormous amount of data that the traditional fundamental investor won't be able to digest and form opinions on without the assistance of the models we have.

The other advantage of quantitative models is that they are not driven by what is going on in the market at a given



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Jim holds a degree in Music Engineering Technology and a minor in Electrical Engineering from The University of Miami. He also holds an M.B.A. in Finance from The University of Minnesota Carlson School of Business. Jim earned the Chartered Financial Analyst designation in 1995.



moment or the emotion or the portfolio manager or the analyst.

The third advantage is that these models are very disciplined. We never waver from our process. We learn from what is going on in the market, and we may apply newly acquired knowledge to a model, but typically, it does not pay for any portfolio manager to react to what's going on in the market that day or that month.

The market is driven by people and people have behaviors they exhibit over and over again and they repeat the same mistakes over and over again. Using quantitative models, we are able to identify and exploit these opportunities.

**Q: Can you give an example of such behavior?**

**A:** For example, investors typically have two types of well identified behaviors related to growth. First, they overreact or underreact with new information in the marketplace. Second, they tend to ignore information that disagrees with

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their prior beliefs. Those are the two trends of Wall Street analysts' earnings estimates in a number of different ways. We'll also look at the longer-term trend of provision analysts' estimates to exploit both of those behavioral anomalies.

**Q: How do you go about portfolio construction?**

**A:** Our portfolio construction is also formed as risk control. We have created a portfolio construction process that is specifically designed to work with our stock selection process so that we can maximize the potential of that stock selection process and at the same time, measure the primary sources of volatility that we don't want in the portfolio.

Once we have our ranking of stocks, using our valuation, quality and sentiment models, our job is to maximize the expected return of the portfolio, but we'll do that within the risk parameters that we have defined. We are concerned about managing our risk parameters around the S&P500 benchmark. First parameter is the market risk, which is similar to traditional measure of volatility. Then, style risk or size risk as defined by market capitalization. We are also concerned with industry and sector exposure.

We have found through our research and in managing portfolios in the last couple of decades that if we stay within the defined boundaries, we will keep our excess returns and our excess risk in line with our clients' expectations.

We have other risk models that are more predictive in nature where we look at tracking error and total risk at the individual stock level to make sure that our risk expectations are in line with what our clients expect.

**Q: How many holdings do you have at any time and what is your turnover?**

**A:** Our holdings are generally about 70 to 100 long and 20 to 50 short, with net market exposure equal to 100 percent. Turnover ranges between 150% -250% annually.

**Q: How is your research process organized?**

**A:** We have a research staff that we call the advanced research center. In our Boston location there are around 30 research analysts. These analysts conduct quantitative research. We have three research analysts within that advanced research center who work exclusively with our U.S. active group and I'm a member of that team. This portfolio is managed through this team.

It is very collaborative in nature. The portfolio managers on the active team may have research ideas on how to improve the models based on observation in the marketplace and oftentimes we are able to discuss these ideas through this research team. Often, the research folks will have research ideas based on academic research or models from other parts of the company or other teams, and they are shared by the team as well.

We meet every morning to discuss news and corporate events of the day. We also have scheduled staff meetings every two weeks to go over research projects that everybody is currently working on. Then we have a higher level meeting every couple of months which defines our research agenda where everybody brings their best ideas for future research, and we talk about priorities and which ideas we are going to work on.

**Q: What are the things that make you unique with that research capability?**

**A:** Unlike a lot of quantitative managers, we are able to do things that are much more difficult, intensive and mathematically rigorous because we have quantitative focus and designated research people. That gives the distinct advantage, particularly in the U.S. market where there are large number of companies and heavy flow of news and information.

**Q: How do you implement your research ideas?**

**A:** We use our researchers' and portfolio managers' ideas to screen out ideas. We test them thoroughly across a number of time frames and metrics. We ex-

amine them in a real world setting and the portfolio managers put their personal check on the idea - should this work, does it fit with our philosophy, are these things driven by investor behaviors and are they likely to persist going forward.

Once the research idea meets those criteria, we will go through a rigorous process in finding a way to incorporate that idea, which takes a form of a quantitative model. We find a way to incorporate that new model into our existing model - we back test it to understand the stock behavior during different economic cycles and investor behaviors, we simulate it in a portfolio setting and we make sure the risk adjusted returns are in our favor.

There is one further step. Our in-house committees have to approve any significant changes to our models. We have an investment committee and we also have a technical committee which is staffed by senior people. We don't change these models on a daily or a monthly basis. Any change that we undertake is driven by intensive research over months and these changes are reviewed by the committee. This keeps models and the investment process stable, but at the same time, we are adding value through incremental changes that have undergone rigorous testing and approval.

### Q: How does an idea turn into a holding?

**A:** We are always looking at how our model is performing and how we can improve it. For example, we noticed that at industry level we were not doing a good job in the semiconductors industry so we decided to see if there is a better way to do this. We undertook a significant research project for two reasons. First, there are a lot of semiconductor stocks out there. Second, there is a lot of volatility in these stocks. If we can get them right, we'll add a significant amount of value for our clients.

So we undertook the project and we used an advanced mathematical technique involving quadratic programming and some other evolutionary techniques. Out of that came a number of factors which drive these stocks that we


would not normally expect in semiconductor industry. These techniques allow us to not only identify new factors, but identify ways that factors interact with each other. Thus we established a semiconductor model that ranks only semiconductor stocks. We ran it by technical and investment committees. It was approved, we implemented it in our financial models and it now is part of our model. So every day, this model picks all the semiconductor stocks in our universe and ranks them from top to bottom in terms of expected return based on the factors we identified, and we use this model in picking stocks. After this model was implemented, we did some trading and bought stocks that looked attractive on the basis of this model, and we sold stocks we owned that were not attractive in this model.

### Q: How do you harvest gains and losses?

**A:** Our trading is driven exclusively by the risk reward criteria in the portfolio. Every day we are looking at the portfolio level and if we were to trade, what would be the expected return of the portfolio. We do not trade explicitly due to a gain or a loss, more typically we will trade because the outlook for the stock based on our models has changed significantly.

In the case of the semiconductors example, some of the trades that we may have done are based on the risk-reward relationship we see in the future, and sometimes they are based on a gain or a loss in the stock.

### Q: What is the goal of the fund and do you measure returns against any benchmark?

**A:** The goal of the fund is to achieve long term growth of capital over time. The benchmark we use to identify our risk and construct the portfolio is the S&P500. One of the measures of success is how we do relative to that passive benchmark. That is the best way we know how to manage our risks and achieve the goal of the fund. 

## Quant Long/Short Fund

Symbol	<b>USBOX</b>
Website	<a href="http://www.quantfunds.com">www.quantfunds.com</a>
Address	Quantitative Investment Advisors Inc 55 Old Bedford Road Lincoln, MA 01773
Tel. No.	781-676-5950
Inception	5/6/1985

<b>PORTFOLIO</b>	
Total Net Assets*	\$2,631
Avg Mkt Cap (\$ Weighted)*	\$44,473
Average Price/Earnings Ratio	13.8
Average Price/Book Ratio	2.6
Turnover Ratio	105%

<b>INVESTMENT INFORMATION</b>	
New Investment	Open
Min Initial Investment	\$2,500
Min Subsequent Investment	\$100
Min Initial IRA Investment	\$1,000

<b>RISK (AGAINST S&amp;P 500 - 3 YEARS)</b>	
Alpha	0.78
Beta	1.00
R-Squared	84.7
Ann Std Deviation	8.10
Sharpe Ratio	1.14

<b>RETURNS VS. S&amp;P 500</b>		
	USBOX	Index
1 Year (Ann.)	10.37%	10.79%
3 Year (Ann.)	12.56%	12.30%
5 Year (Ann.)	5.88%	6.97%

<b>FEES AND EXPENSES</b>	
Max Sales Charge - Front	0.00%
Max Sales Charge - Deferred	1.00%
Max Redemption Fee	0.00%
Total Expense Ratio	1.47%

<b>PORTFOLIO MANAGER</b>	
James Johnson, CFA	2005

\*millions

Data through: 9/30/06

Source: Company Documents; Lipper

Ticker staff searches for mutual funds for their consistency in performance and durability of investment style.

Our interview covers investment philosophy and strategy, research process, portfolio construction and risk control for funds. Through an interview we uncover long-term strategies and processes that help to generate long-term returns.

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