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Quants' Quandary: Crossing the Chasm

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PART ONE OF FIVE PARTS

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ABSTRACT

In a series of five installments, Rick Roche will explore and analyze the acceptance and diffusion of quantitative investment management. Mr. Roche upends widely-held, erroneous assumptions and media assertions of widespread quant investing. Contrary to mainstream media portrayal of widespread adoption of quant fund investing, the author documents that a surprisingly small sum of individual and institutional dollars has been allocated to quant strategists.

Part One – Quantifying Quants in Global Wealth Assets

In Part one of a five-part series, Mr. Roche places into its proper context the amount of quant-managed fund allocations and describes in general potential benefits and drawbacks associated with quantitative investment. Over a fourteen-month period, Rick Roche conducted over 40 in-person surveys on quantitative investment recommendations by Chartered Financial Analysts and advisors.

Quants' Quandary: Crossing the Chasm

quan * da * ry n. a state of doubt, confusion or uncertainty (1st known use was in 1579)

In a 2017 global hedge fund survey, Preqin, an alternative investment industry researcher and publisher, stated there were ~3,600 quantitative investment strategists who managed \$1,019 billion in hedge fund assets.¹ In an October 2017 report, Morgan Stanley sized the industry about 50% larger by including quantitative mutual funds and 'smart beta' exchange traded funds (ETFs). Morgan Stanley stated there was \$1.5 trillion of assets invested in factor- and quant-based funds, as of July 2017.² That led some leading financial publications to proclaim that "The Quants (are taking over) run Wall Street now."³

While a trillion and a half in assets under management (AuM) is nothing to sniff at, one needs to put this figure in its context. As of this writing (February 2019), the United States' capital markets are valued at roughly \$71 trillion. The "outstanding United States bond market debt" was \$42.385 trillion (3Q 2018) and \$28.397 trillion for the Wilshire 5000 Total Market Index (widely regarded as one of the broadest measures of the U.S. equity market cap).⁴

The Investment Company Institute (ICI), the mutual fund industry trade and research group, estimated that in 3Q 2018, there was \$50.09 trillion in worldwide regulated open-fund assets.⁵ In recent email correspondence (December 2018), Morgan Stanley updated their estimate of the AuM of quant-focused funds. Morgan Stanley Research estimates there was \$1.7 trillion in quant/factor investing as of June 30, 2018. Morgan Stanley tallied \$821 billion in quantitative mutual funds, \$472 billion in quant hedge fund assets and \$433 billion in smart beta ETFs.⁶

McKinsey & Company just released their latest estimate of global assets under management. Their November 2018 report placed the size of global investment assets at \$88.5 trillion as of year-end 2017.⁷ So quant investment strategies command a mere fraction—roughly 1.5% netting out smart beta ETF AuM—of the amount of global investment AuM. Hardly a quant takeover of U.S. and global capital markets as alleged by mainstream media conglomerates!

Here is the quants' quandary. Although mainstream media and even (informed) financial trade press have declared that quants are taking over Wall Street, the facts show otherwise. These hyper claims are reminiscent of "Gartner's Hype Cycle" which highlights overhyped ideas and technologies and projects when (and if) these trends will reach maturity.⁸ On the Hype Cycle, there's a trigger—in this case the birth of quant investing—that provides visibility into an innovation. This trigger leads to a "Peak of Inflated Expectations." The Peak is followed by a "Trough of Disillusionment." Quant pioneers and enthusiasts are still stuck in a decades-long trough where quantitative investing has yet to cross the chasms that separate innovators from the mainstream market of institutional and individual investors.

For a moment, compare quantitative investing's adoption trajectory to the \$5 trillion Exchange Traded Funds (ETFs) industry.⁹ ETFs were born in Canada in 1990. The first exchange traded product (ETP)—the Toronto 35 Index Participation units (TIPS)—was listed on the Toronto Stock Exchange in March 1990.¹⁰ Then along came a SPDR . . . ETFs were raised in the USA. In January 1993, the American Stock Exchange and State Street Global launched the Standard & Poor's Depository Receipts—SPDR (symbol SPY).¹¹ (Obviously, some ETFs are quant-based and included in Morgan Stanley's count.)

An adolescent industry, smart beta funds are only a dozen or so years old. (INVESCO launched the FTSE RAFI US 1500 on September 20, 2006.)¹² Yet in December 2017, smart beta funds' assets crossed the \$1 trillion mark, only 1/5th of the time it took quantitative funds to reach the \$1 trillion AuM milestone.¹³ So here's the bottom line question: given the size of the U.S. and global capital markets, ETFs widespread diffusion and rapid adoption of smart beta funds, why isn't the quantitative investment fund share much bigger than it is? Why are advisors hesitant to recommend and investors reluctant to invest in quant strategies?

The Survey Says?

"Whenever you can, count."¹⁴ - Sir Francis Galton (1822 -1911)

From October 2017 through November 2018, we conducted in-person surveys into the number of financial advisors and analysts who had made client allocations to quantitative investment strategies and funds (funds of all types, hedge funds, mutual funds, SMAs, and ETFs). Maybe we shouldn't have been, but we were otherwise genuinely surprised to find that in 41 FPA, CFA, and CAIA meetings (total audience ~1,850), a small percentage of advisors had made recommendations or client allocations to quantitative funds. Only single digits of the Certified Financial Planners (CFPs), Chartered Financial Analysts (CFAs) and Chartered Alternative Investment Analysts (CAIAs) in attendance raised their hands in response to the question, "Have you made an allocation to a quantitative investment fund?"

We are not suggesting our advisor sampling of quantitative investment use meets the rigorous standard of a scientifically-valid survey protocol. Maybe the advisors in attendance who came to learn about artificial intelligence in asset management (and earn one-hour of CE credit) are not representative of the entire universe of financial advisors? Or just maybe the quant aficionados stayed in their offices because they already knew a lot about quant funds or don't need another hour of CE credit?

But our expectation was that easily 10 to 15% of these accredited financial professionals would have conducted due diligence on quant strategies and had already made allocations to client portfolios. Why the resistance or reluctance when it comes to adopting quantitative investment strategies?

Quant Fund Refresher

**“The investor’s chief problem—and even his worst enemy—is likely to be himself.”
- Benjamin Graham, The Intelligent Investor¹⁵**

Here are the working definitions in this article to describe “quantitative” investment strategists versus discretionary or ‘qualitative’ investment managers. Quantitative refers to whether the required inputs to a manager’s allocation and portfolio construction process are predominately objective and quantifiable. Quantitative investment employs trading models and trading signals generated by computer algorithms. Qualitative asset management refers to whether the required inputs are predominately subjective (discretionary) and not quantifiable. Qualitative security selection or asset allocation may be arbitrary whereas quantitative strategies follow a rules-based, disciplined investment process.

While quants come in all shapes and sizes, we’ll borrow Man FRM’s simple categories of two types of quantitative strategies (Man FRM is a UK-based, global alternatives investment specialist).¹⁶

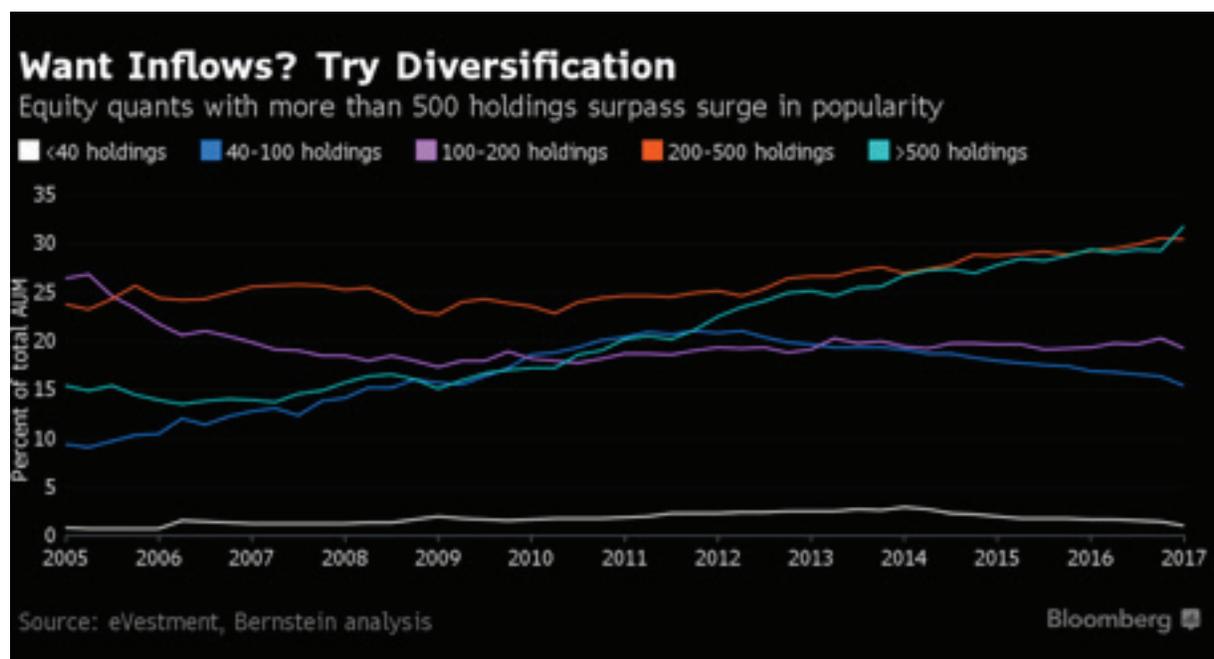
The quantitative fund universe can be broken into two broad categories, based largely on the source of individual trading ideas:

Micro-based Strategies include statistical arbitrage (StatArb), equity market neutral, trading ideas and alpha-capture models that primarily trade equities.

Macro-based Strategies include Commodity Trading Advisors (CTAs), risk parity and managed futures that trade futures and derivatives across a wide array (hundreds) of commodity, currency, equity index and fixed income index contracts and markets.

Within each strategy, asset classes traded, holding periods (milliseconds to months), markets, and models used vary widely. Sometimes the boundaries between these two broad categories blur and larger quant shops and hedge funds often use both types.

Before attempting to answer questions on resistance and reluctance to adopt quantitative investment strategies into client portfolios, a quick primer of generic quant funds’ “potential” benefits follows:



- **The Law of Large Numbers.** Quantitative investment strategists use automated systems to objectively evaluate a wide swath of securities and potentially benefit from a wider opportunity set. According to Sanford Bernstein Research, most equity quant managers hold at least 500 securities.¹⁷ A recent academic survey of 4,223 distinct mutual fund portfolios found that the median number of holdings in equity funds was 75 positions.¹⁸ Most quant funds have at least 500 names; some have 10,000 holdings. On average, quant strategies have six times more holdings than discretionary or fundamental funds.

Of course, not all of a quant manager's trades will generate profits. However, due to the high number of portfolio positions, a winning/losing trade ratio of 51/49 may be enough to offer a reasonable likelihood of generating a positive return at the portfolio level.

- **More Diversified.** It goes without saying that quant funds are much more diversified than qualitative or discretionary managers. Acknowledging of course, that in order to achieve genuine diversification, quant strategists need to be mindful of the correlations among securities held. A critical component of a quant model optimizer is its correlation matrix and recognizing that correlations are dynamic. Correlations vary around a long-term central tendency—they're conditional and depend on market states or regime changes.¹⁹ Quant fund portfolios tend to be better diversified, not only across individual securities, but by sector, country, and currency exposures.²⁰
- **Bet-Sizing.** For actively-managed funds, the best portfolio is usually the one that can be sized most accurately, rather than the highest Sharpe ratio or highest expected return. Generally speaking, quant strategists are more adept at position sizing and placing diversified bets than (most) discretionary managers. Full-fledged quantitative strategists use a variety of models, including alpha-seeking, position-sizing, risk management, and transaction cost models. The model that predicts the "side of the bet" (long or short) should be different from the model that determines the 'size of the bet.'²¹
- **Mitigating Human Error/Cognitive Bias.** Financial analysts, advisors and portfolio managers (PMs)—just as all highly-evolved humans—are prone to bias. There are numerous primitive, unconscious biases and cognitive limitations that affect and afflict investor decision-making. Several examples (that won't be explored in depth) are confirmation bias, anchoring, loss-aversion, and familiarity bias. Investment algorithms addresses human weakness in speed, attention, fatigue, and biases. Quant models help minimize human errors (notice we didn't say eliminate because of the potential for bugs). A key differentiator of quantitative models is the computational advantage that a disciplined approach has in systematically making predictions upon entry/exit in securities transactions. Quantitative models are superior to discretionary managers when cutting short losses and realizing gains.²²
- **Systematic Search for Factors/Risk Premia.** Systematic specification of inputs for asset allocation models clarify central elements of portfolio construction. Quants search for risk factors, risk premia, and market anomalies. Quants attempt to build models to identify empirical relationships between securities and asset classes.

For example, statistical arbitrage (StatArb) is a quantitative short-term trading strategy. It typically employs mean reversion involving a portfolio of hundreds or more securities. It attempts to exploit price anomalies and is typically non-directional. The theory behind price-mean reversion is that there exists a center of gravity around which prices fluctuate. Quants believe it's both possible and profitable to locate this center of gravity and quantify the level of price fluctuation that merits making a trade.

"Pairs Trading" is a form of StatArb that seeks relative value and arbitrages the difference by going long poorer recent-performing securities and selling short outperformers with the expectation that within the near future (in seconds to days) their values will revert to the means. These portfolios of longs and short positions are carefully matched by sector and region to mitigate market risk.²³

- **Beta Exposure Management.** Financial markets invite quantification. Returns, risk factors, and correlations lend themselves to numerical measurement. When it comes to modulating or mitigating beta exposure, quantitative algorithms work faster than humans and are more consistent. We'd argue

that without quant models, the only practical method of managing equity exposure is to go all cash or 100% fixed income.

- **Low/Negative Correlation (CORR) to Traditional Asset Classes.** Historical correlations between quantitative and qualitative investment managers are low, suggesting the potential for investors to benefit by incorporating both approaches in their portfolio allocations. Select quant funds, specifically “Systematic Global Macro,” have very low correlations to equities and bonds. From January 2001 to June 2017, Systematic Global Macro funds’ monthly returns had -0.13 CORR to the S&P 500, -0.06 CORR to the MSCI All Country World Index (ACWI), and 0.25 CORR to Barclays Aggregate Bond index. Worth noting is that although correlations are time-varying, the Systematic Global Macro strategy was genuinely defensive in that its CORR to MSCI-ACWI declined during the 2007-09 Global Financial Crisis.²⁴ In addition, the historical correlations between quant and systematic strategist cohorts are also low, dispelling the notion that “all quants trade the same signals.”²⁵

SUMMARY

In summary of part one of a five-part series, the author dispelled conventional wisdom on the widespread use and size of quantitative investment market as a percentage of overall investment assets. Contrary to even financial trade press reporting, quantitative investment management is a mere fraction of U.S. and global wealth assets.

In Part 2—“Quants Orphans Want Adoption”—the author discusses where quant investing is on the “Adopter Categorization” scale and why investors have been reluctant and resistant to quant strategies.

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The opinions expressed in this publication are those of only its author, Richard Roche, and not those of Little Harbor Advisors, LLC. Any errors or omissions are the sole responsibility of Rick Roche.

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