Case Study:

History of Jane Street

EXECUTIVE SUMMARY

May 2020

INTRODUCTION

Volatility.

It's like the highest-octane fuel in the engine of every proprietary trading and market making firm – and it is very difficult to capture, harvest or extract from an incessantly violent onslaught of data. Moreover, it is exceedingly - if not, impossibly - difficult to predict (over any time frame) with consistency. The exception – the *only* exception – to this axiom is to be consistently positioned to benefit from shifts in volatility, and nimble enough to react favorably when those shifts occur.

Now, many – certainly, dozens of – trading firms have satisfied these criteria to a wide spectrum of success. The most prominently distinguishing factor among them – like the achievement of karate's grand master black belt level - is *scale*; a factor which has paradoxically established a fault line between those who navigate to scale and those who do not. As the wielding of technology – and the absence of regulatory impediments to buffer its impact on market macrostructure – promotes *winner-take-all* (WTA) competitive dynamics in the ecosystem, market makers either battle in the Octagon for each increment of scale or risk existential threats. It is no longer enough to passively tread for a tide of benevolent volatility to lift your brand of boat unless you are content to remain in your basement where the clock is accurate at least twice per day.

Today, there are five factors that must be mastered to maximally scale a trading operation in closest possible proximity to the sources of listed transactions – arguably, for each product class. In addition to volatility, these include inventory, liquidity, information asymmetry, and *processing*. Adding an extra alley-oop to the magnitude of the challenge: There's only one of these factors that can be controlled. And, it has potential to represent the Everlasting Gobstopper of special sauces…

TOP PROPRIETARY FIRMS

Among the global roster of proprietary trading and non-bank market making firms, Alphacution has identified *twelve* that epitomize the successful navigation of the contemporary gauntlet required to achieve scale. Exhibit 1, below, kicks us off with a ranked list of these firms by founding year.

EXHIBIT 1: ORIGINS OF TOP GLOBAL PROPRIETARY TRADING AND MARKET MAKING FIRMS, BY FOUNDING YEAR

Parent	Founded	Home	Origins[a]
Optiver Holding BV	1986	Amsterdam	Options
Susquehanna International Group, LLP	1987	Philadelphia	Options
IMC Trading BV	1989	Amsterdam	Options
Citadel, LLC	1990	Chicago	Equity-Linked
DRW Holdings, LLC	1992	Chicago	Futures
Tower Research Capital, LLC	1998	New York	Equities
Jump Trading, LLC	1999	Chicago	Futures
Jane Street Group, LLC	1999	New York	Equity-Linked
Two Sigma Investments, LP	2001	New York	Equities
Hudson River Trading, LLC	2002	New York	Equities
Flow Traders BV	2004	Amsterdam	ETFs
Virtu Financial, Inc.	2008	New York	Equities

a) Color key associated with Origins

Source: Alphacution, SEC, UK Companies House, company data

Certainly, the presentation of this list up front is not to imply that these are the only success stories on the field. There are other successful players to watch and fascinating stories about them to tell. Though Alphacution has provided glimpses of a much broader roster of players on its Feed, we will get to deeper dives on them over time.

For now, the point is to remain focused on the objectives – the DNA - of a successful scaling strategy under conditions of finite alpha capacity and WTA competitive dynamics: The inventory of suitable products. The liquidity spectrum of those suitable products. A favorable disposition to a myriad of fleeting information asymmetries. And, a favorable disposition to volatility (which has little in common with information asymmetries given our post-Global Financial Crisis (GFC) era of aggressive interventionism).

The only aspect of these objectives that can be controlled in service of growth is one's *response* to them. Like a stem cell, processing – *a maniacal sensitivity to processing* - is the source of all responses; and thus – in this game – all competitive advantages. Among the upper echelon of firms in this space, Alphacution ranks Jane Street among the top three…

SCOPE OF JANE STREET

What originally appears to have started out as Henry Capital in August 1999, has become one of the most successful proprietary trading firms in the world today. It's a very short list of those who have forged success across regions, product and asset classes, strategies – and time. Exhibit 2, below, is an illustration of the specific entities that make up the organizational structure within which such success has been forged over the ensuing 20[+] years.

EXHIBIT 2: JANE STREET GROUP, LLC – AFFILIATED OPERATING AND HOLDING ENTITIES BY REGION, 2019
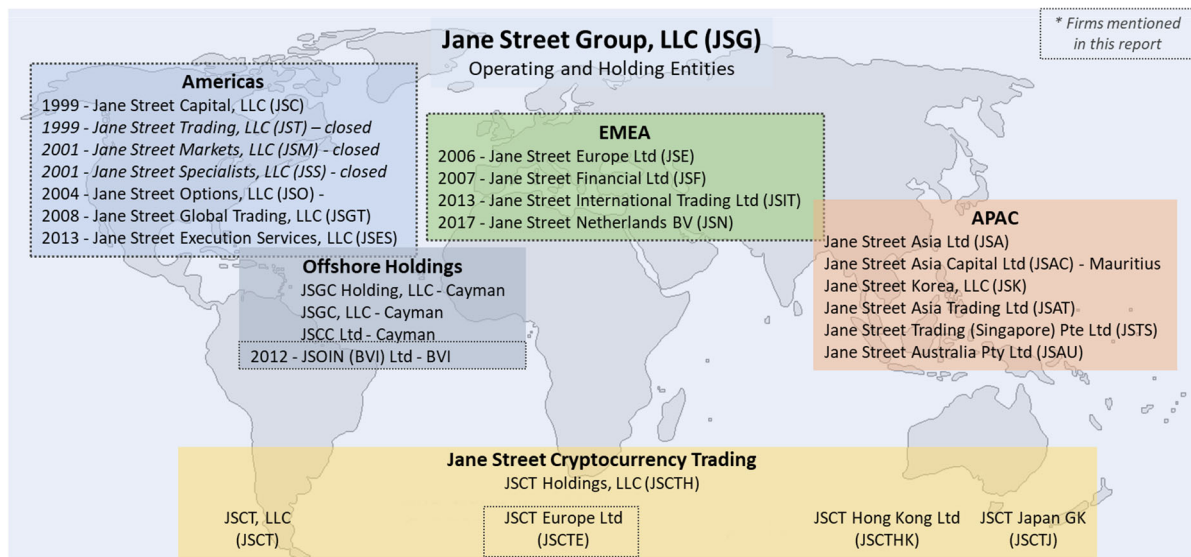
Source: Alphacution, FINRA, SEC, UK Companies House,

Not much is known about the origins of Jane Street, - officially or unofficially among the mythologies that travel the backchannels of trading lore – other than an occasional media reports about its prowess as one of the largest ETF market makers. Though some mythologies - as if fossilized in amber - have been suspended in time due acquisitions, those that persist like living histories can be roughly bifurcated between those where the founders contributed, wittingly or unwittingly, to the mythology and those who did not. Think Ken Griffin, Jim Simons, or Cliff Asness in the contemporary cases where the founder has become synonymous with the brand. And then, try to conjure up the founders of Susquehanna International Group (SIG). For most, you can't do it.

That's the old-school prop world…

Jane Street, at least to this author, is like the latter – and we purposely chose not to ask around as part of the preparation for this case study. It's a bit more interesting to us to see what can be found, lying around, hidden in plain sight. All we discovered is that Jane Street was co-founded by Tim Reynolds – "and two friends" - Michael Jenkins and Robert Granieri. According to regulatory filings, Mr. Jenkins and Mr. Granieri are still affiliated with the firm as operating committee members. Richard S. Emmet is CEO.

Mr. Reynolds' modest bio includes that he was a member of the New York Stock Exchange and the American Stock Exchange as a specialist and derivatives floor trader. He retired from Jane Street in 2012. A paraplegic because of a car accident in 2000, Reynolds also co-founded the non-profit Reynolds Family Spine Laboratory in 2006.

But, don't let a sparse opening fool you. While the mythology may have somehow been muted or well-managed as the firm battled to deliver success after success; all the while navigating everything that has happened over the first decades of the 21st century, this project has proven to deliver Alphacution's most substantial case study to date; in size, by at least a factor of two. More than that, after we thought that case studies on Citadel, and then SIG, and then Two Sigma were unprecedented, this case study has taken our definition of unprecedented to new level.

Enjoy…

DATA SAMPLE

The storyboards and select findings contained in this report represent Alphacution's interpretation of a total 239 regulatory reports representing *Jane Street Group, LLC (JSG)*, its predecessors and certain affiliated entities, including (most notably*) Jane Street Capital, LLC (JSC)*, *Jane Street Options, LLC (JSO)*, *Jane Street Europe Limited (JSE)*, and *Jane Street Financial Limited (JSF)*, among others. The supporting data sample is comprised specifically of the following:

- 68 quarterly 13F[1] holdings reports (including 13F-HR/A amendment reports, wherever applicable) for the 17-year time range beginning March 31, 2003 (or, Q1 2003) and ending December 31, 2019 (or, Q4 2019) by the *Jane Street Group, LLC* lineage of reporting entities that originally included Henry Capital, LLC (Q1 2003 – Q4 2004) and Jane Street Holding, LLC (Q1 2005 – Q4 2013);

- 46 quarterly 13F holdings reports (including 13F-HR/A amendment reports, wherever applicable) for the more than 11-year time range beginning September 30, 2008 (or, Q3 2008) and ending December 31, 2019 (or, Q4 2019) by *Jane Street Capital, LLC*;

- 46 quarterly 13F holdings reports (including 13F-HR/A amendment reports, wherever applicable) for the more than 11-year time range beginning September 30, 2008 (or, Q3 2008) and ending December 31, 2019 (or, Q4 2019) by *Jane Street Options, LLC*;

- 19 annual FOCUS reports (on Forms X-17A-5 and X-17A-5/A, wherever applicable) for the years ending December 31, 2001 thru December 31, 2019 filed by *Jane Street Capital, LLC* with the SEC, FINRA and SIPC;

- 13 annual FOCUS reports (on Forms X-17A-5 and X-17A-5/A, wherever applicable) for the years ending December 31, 2001 thru December 31, 2013 filed by *Jane Street Markets, LLC* (JSM; fka *Nassau Street Capital, LLC*) with the SEC, FINRA and SIPC;

- 6 annual FOCUS reports (on Forms X-17A-5 and X-17A-5/A, wherever applicable) for the years ending December 31, 2003 thru December 31, 2018 filed by *Jane Street Trading, LLC* (JST; fka *Bowery Capital, LLC*) with the SEC, FINRA and SIPC;

- 8 annual FOCUS reports (on Forms X-17A-5 and X-17A-5/A, wherever applicable) for the years ending December 31, 2006 thru December 31, 2013 filed by *Jane Street Options, LLC*

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[1] Form 13F is a quarterly report filed, per United States Securities and Exchange Commission regulations, by "institutional investment managers" to the SEC and containing all position-level equity assets under management of at least $100 million in value with relevant long US holdings. All US-listed equity securities (including ETFs, equity options, and convertible bonds) in the manager's portfolio are included and detailed according to the issuer name, security description, the security identifier (i.e. – CUSIP number), position value, number of shares, and other attributions. As of March 31, 2019, Alphacution estimates that the full list of Form 13F securities count totals 17,707 securities. Short positions are not required to be disclosed and are not reported. Form 13F covers institutional investment managers, which include registered investment advisers (RIAs), banks, insurance companies, hedge funds, trust companies, pension funds, mutual funds, among other natural persons or entities with investment discretion over its own account or another's. Form 13F is required to be filed within 45 days of the end of a calendar quarter. Find more about the 13F dataset on the Alphacution Feed.

with the SEC, FINRA and SIPC (*and where expected reports for years 2014 through 2019 were expected, not found, and believed to be missing*);

🐦 7 annual FOCUS reports (on Forms X-17A-5 and X-17A-5/A, wherever applicable) for the years ending December 31, 2013 thru December 31, 2019 filed by *Jane Street Execution Services, LLC* (JSES) with the SEC, FINRA and SIPC;

🐦 11 full account reports disclosing financial and operational data for the years ending December 31, 2008 thru December 31, 2018 filed by *Jane Street Europe Limited* with the United Kingdom's registrar of companies, Companies House;

🐦 10 full account reports disclosing financial and operational data for the years ending December 31, 2009 thru December 31, 2018 filed by *Jane Street Financial Limited* with the United Kingdom's registrar of companies, Companies House;

🐦 5 full account reports disclosing financial and operational data for the years ending December 31, 2009 thru December 31, 2018 filed by *Jane Street International Trading Limited* (JSIT) with the United Kingdom's registrar of companies, Companies House;

🐦 Any other peripheral data or content referenced in this report that was available from open and public sources or searchable on the surface internet; and,

🐦 Contextual modeling, exhibits, case studies, Feed posts and/or any other pre-existing content from Alphacution's research library.

No representative of Alphacution has been in contact with any representative of Jane Street Group, LLC or affiliated entities for the preparation of this report. This report is solely based on the author's interpretation of Alphacution's ongoing assembly of raw data, contextualized modeling, and internally developed content. This report does not benefit from, nor include, any material non-public information (MNPI).

RESEARCH MISSION

Why is this research important?

For all Alphacution research output, there are two parallel objectives at play. The first is to shed light where there has historically been very little. This means leveraging the underlying data to frame basic parameters of one or more firms' trading strategies, portfolio construction techniques and important themes as accurately and in as much detail as possible. The second objective is focused on learning *how* to assemble, visualize, interpret, and communicate complex topics in ever more creative, yet consumable, ways to expand our understanding of the subject matter.

Since no one other than Alphacution has ever assembled, visualized and interpreted such freely-available data out in the open before - and the underlying mechanics of highly automated, high speed and/or multi-product trading strategies are complex and often unfamiliar to many in our network - there is a significant amount of experimentation that goes into the development of this output. There is no textbook or pre-organized roadmap for what we do. And, where experimentation is ongoing, inevitably, unintended errors and misinterpretations may occur, as well. Ideally, our interpretations improve over time with more data, modeling, and analysis. We believe they have. From the beginning, each case study was considered consequential – and published with pride. Furthermore, each subsequent case study has lived up to our high standards; each improving in ways, big and small, over prior examples. This case study is no exception to that progression.

Nevertheless, we believe our readers bear some responsibility to harvest their own insights from this work, given their unique – and sometimes more informed – perspectives on the subject matter. Alphacution is committed to presenting the data in highly visual formats because that is the most efficient way to translate and make consumable significant amounts of information. In the end, much of this exercise comes down to interpreting "shapes," – the wiggly lines, trajectories, spikes, and other anomalous geometries formed by the data – to best inform our readers. Though our interpretations may not always be the most appropriate for every circumstance or the most relevant for every reader, our attempts at interpretation are intended to educate as much as they are meant to explain. Consumers of this research are advised to learn how to "read" the shapes presented in our output for their own purposes.

The point being: With this research, developing a sensitivity to the shapes is a priority. Each subtle or not-so-subtle twist, both individually and contextually, carries potential to mean something. There is a visual language under development here. Keep this in mind as you review this, and any other, Alphacution output. We will continue to point out opportunities for interpretation and the occasional illusion, whenever relevant.

GLOSSARY

There are a few common terms used in this report. Abbreviations are occasionally employed to minimize exhibit title length and excessive word count, wherever practical. These include:

- Key Entities - The most common entity abbreviations are as follows (See Exhibit 2 for full entity abbreviation list)
    o JSG - Jane Street Group, LLC
    o JSC – Jane Street Capital, LLC
    o JSO – Jane Street Options, LLC

- Gross Value (GV) – All 13F value figures are originally reported as gross notional long market value (GNLMV). Throughout this report, the labeling for these values will be simplified to *gross value (GV),* or some derivation thereof, such as *gross product class value (GPV)*. Gross value is a <u>one-sided</u> measure.

- Fair Value (FV) - All FOCUS report (on Form X-17a-5) value figures are originally reported as fair value (FV), unless otherwise defined. Fair value is a <u>one-sided</u> measure. Note: G*ross Fair Value* (GFV) means the sum of the value of securities owned and the value of securities sold, but not yet purchased. (Gross fair value is a <u>*two-sided*</u> measure.) Derivations of GFV include *gross product class fair value (GPFV)*. *Net Fair Value* (NFV) means the value of securities owned less the value of securities sold, but not yet purchased. **Do not confuse *gross fair value (GFV)* with *gross value (GV)*.**

- Product Class (PC) – Many exhibits refer to product class-specific analysis, such as cash equities or ETF options. In many cases, *product class* is abbreviated to *product* or *PC*.

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ABOUT ALPHACUTION

Alphacution is in the *intelligence* business.

Originally founded in 2004 by market veteran Paul Rowady, Alphacution Research Conservatory LLC ("Alphacution") is a research and strategic advisory platform uniquely focused on measuring, modeling and benchmarking the evolutionary impacts of technology on global financial markets and the trading, asset management, and banking businesses they serve. Based on an expanding research library focused on the modeling of specific market actors, composited industry segments, and key thematic drivers, the Alphacution platform is specifically designed to deliver data-driven and quantitatively based intelligence to a forward-thinking network of market participants and their stakeholders.

AUTHOR

Paul Rowady is the Founder and Director of Research for Alphacution and a 30-year veteran of proprietary, hedge fund and capital markets research, trading, and risk advisory initiatives. Paul has earned an extremely unique spectrum of expertise across a range of fundamental and quantitative strategy research methods, derivatives trading, risk management, and techno-operational developments at the highest levels. Prior to relaunching Alphacution in 2015, he was the founding principal of TABB Group's technology, analytics, and data advisory practice. Paul has also held senior roles with firms like O'Connor & Associates – as Research Analyst and Portfolio Manager; Quantlab Financial – as Co-Founder, Head of Trading and Risk; and, Ritchie Capital Management – as a Managing Director, Head of Research. Paul earned a Master of Management from the J. L. Kellogg Graduate School of Management at Northwestern University. He was also awarded a patent related to an event-driven trading analysis and volatility prediction interface and system in 2009.

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