The Business of Quant

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Administrivia

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Guest Speaker: David Mittelbusher

Recapping last week

- Popular strategy ideas:
    - CTAs
    - Statistical Arbitrage
    - High frequency trading
        - Payment for order flow & Robinhood

Building Quant Businesses

Asset Management

- **Basic model: "I'll try to grow your money; You pay me a fee"**
- Four ways of charging fees:
    - Per-transaction (brokers and some wealth management advisors)
    - Fixed (for small accounts, typically)
    - Percentage of assets
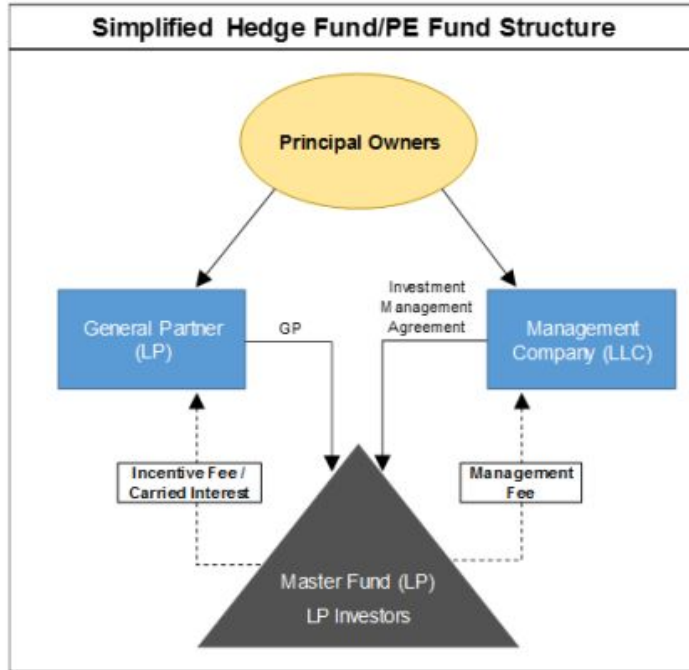   - Percentage of assets + Percentage of gains

Mutual Funds

- Need to be open to all
- Minimal Leverage
- Liquid instruments
- Daily Pricing
- No performance fee!

HF + PE + VC

- Accredited investors (>$200K income or >$1M assets)
- Reporting requirements in some cases
- Fairly loose rules
- Charge what the market will bear

HF vs VC vs PE

Simplified Hedge Fund/PE Fund Structure

Hedge Funds   vs Private Equity / Venture Capital

- Public markets   Private markets
- Management fee in both
- Performance fee ⟷ Carry
- Capital on 1st day ⟷ Capital Calls
- Mark to market   Mark to ???
- Liquid   Illiquid

The Hedge Fund Business

AUM	Gross Returns	Management Fee	Performance Fee	Net Return	HF Revenue	HF Costs	HF Profits
$1M	10%	2%	20%	6.4%	$36K	$0.4M	-$364K
$25M	10%	2%	20%	6.4%	$0.9M	$0.4M	$0.5M

Addendums:
- **High Watermark**
- Share Classes (Discounts to early investors or Fund-of-funds)
- Separately Managed Accounts

Types of Quant Funds

Split by Bravery, Brawn or Brains

- Very few large firms based exclusively on Brains
- Brains edges more commonly seen in small firms
- Brains edges often "grow up" into a Brawn+Brains or Bravery+Brains edge

Business Size (except proprietary trading firms):

- Single-theme funds: < $1B
- Smaller multi-strat funds: $1-5B
- Mega firms: $5-$50B
- > $100B: AQR, Bridgewater

Bravery–based Business Models

Strategies Involved	Factor Investing, CTA, Risk Parity
Performance	Low sharpe, Moderate returns, Mildly correlated
Capacity	Huge >50B
Operating Cost	Low
Customer Acquisition	Large potential markets: pension funds, SWFs, retail Potential for customer churn due to risk involved
Competitive Edge	Sales, Branding (e.g. thought leadership), **Pricing**

Bravery-based Business Models

Example: The Rise & Fall of Bill Miller

The Long Climb and Steep Descent of Legg Mason's Top Stock Picker

By Jason Zweig
November 18, 2011

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What's the difference between a hero and a goat? Just ask Bill Miller.

The once-revered mutual fund manager announced Thursday that he will step down in April as lead manager of the Legg Mason Capital Management Value Trust. In a business that thrived for decades by nurturing the cult of the star
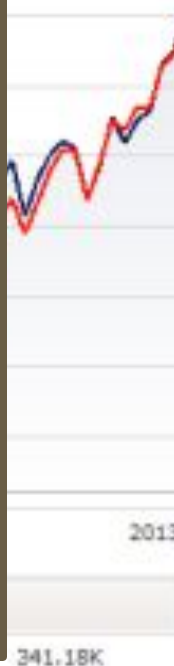
Brawn-based Business Models #1

Strategies Involved	HFT
Performance	High Sharpe, Great returns, Uncorrelated
Capacity	Low (<1-5B)
Operating Cost	Very High
Customer Acquisition	Very easy once the model is proven Strong pricing power (but mostly, prop money)
Competitive Edge	**Large scale** to absorb high fixed costs **Spend on technology**: speed and connectivity (technology) Footprint and deal-making (e.g. Virtu)

Brawn-based Business Models #1

Brawn-based Business Models #2

Strategies Involved	Multi-strat: aggregator of various strategy types
Performance	Moderate Sharpe, Moderate Returns, Possibly Correlated
Capacity	Huge (>50B?)
Operating Cost	Moderate
Customer Acquisition	Significant sales effort needed Look for customers who can't access individual pieces Pricing power under pressure
Competitive Edge	**Talent arbitrage**: be good at picking quants (and firing them) Branding: be seen as a good talent-spotter **Scale**: Netting benefits, Alpha capture

Brawn-based Business Models #2

Brawn–based Business Models #3

Strategies Involved	Predicting performance + Statistical arbitrage + Factors
Performance	Good Sharpe, Good returns, Less correlated than #2
Capacity	Medium to High (5-30B?)
Operating Cost	High
Customer Acquisition	Sales is much easier than Bravery-based models Stronger pricing power than Bravery-based models

Competitive Edge	Invest in technology and infrastructure to:
	   - **Identify new data sources continuously**
	   - Generate alpha from them and integrate into the system
	Large scale, to absorb data costs

Brawn-based Business Models #3

Brains–based Business Models

Proprietary capital

- Limited scalability. Otherwise, transition to a Brawn+Brains or Bravery+Brains model
- Under the radar, to safeguard their IP and competitive edge
- Often occupy a niche (e.g. Jane Street)

Startup, Sub-$1B funds

- Difficult space of the market: high costs
- Have to do a lot of sales to convince customers of value

Building a Quant Career

Careers in Quant

Additional Axis: Sales

Coding
- Speed, not scale
- Internal customers

Trading
- Domain knowledge
- Bet sizing and risk management

Data Science
- In addition to ML, ideas from traditional Statistics, Physics, Math

What Kind of Quant Career Might Suit You?

Depending on what you like...

- Building big systems or fast systems?
- Kaggle type ML or more research-oriented ML?
- Competing with others or collaborating with them?
- Ok making quick, possibly incorrect decisions or want to take your time?

...you can find a role that suits you best

HFT Software Dev; Bank trading algo designer; Gray box trader

Quant researcher; Portfolio manager; Quant fund sales

Quant vs. Tech Careers

- Project scope and duration

- Front-end vs Back-end work

- Specialist vs generalist work

- Team sizes

- Stress & work-life balance

- Compensation

Quant Careers outside Quant Funds

Service Providers: fund admin, risk mgmt

Prime Brokers & Investment Banks

Alternative Data Provider

Quant Fund

Pension Funds, SWFs, Allocators

FinTech, VC, PE
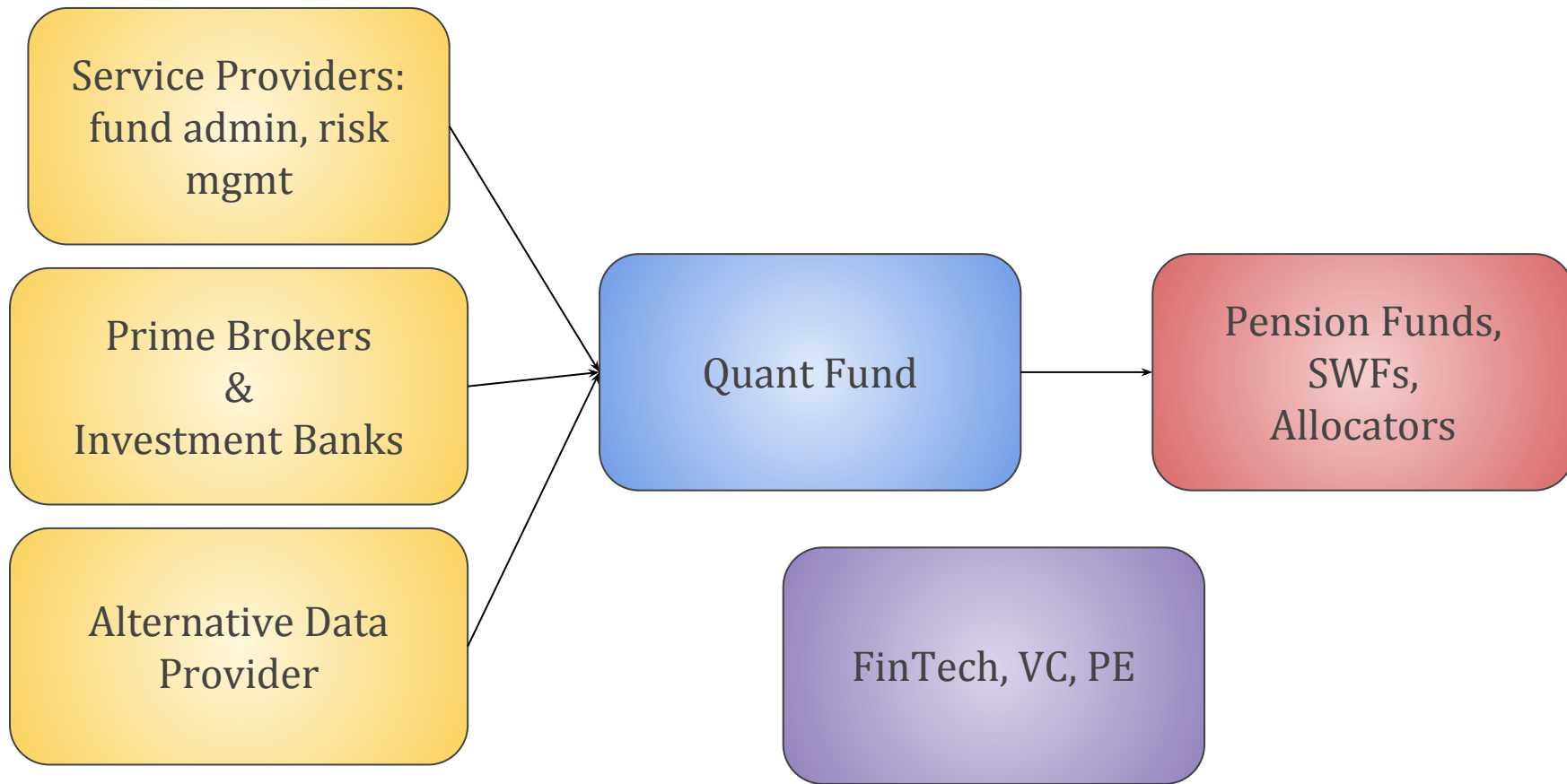
What if you want to just trade your personal portfolio via quant algos ?

- Rule #1: Think about your taxes and transaction costs
  - Feasible quant strategies will typically look like slow-moving asset allocation ideas

- Rule #2: Figure out your edge

- Rule #3: Manage risk. Be skeptical of your signal initially.

- Rule #4: Do what is consistent with your psychology

Further Reading
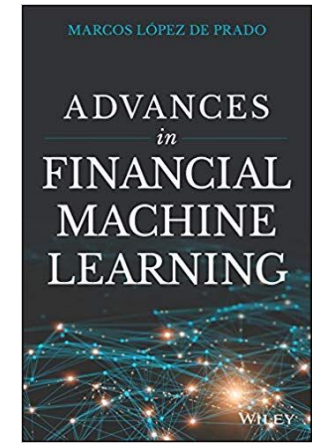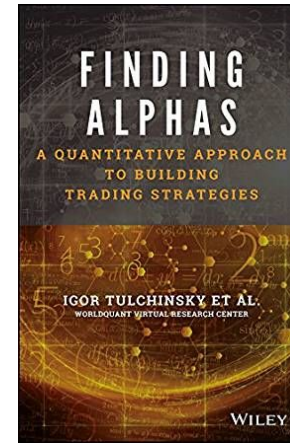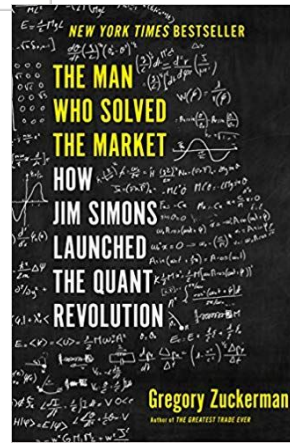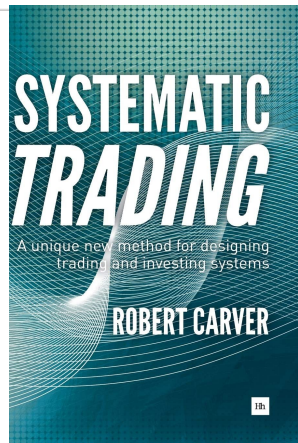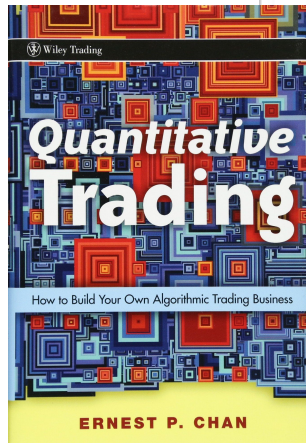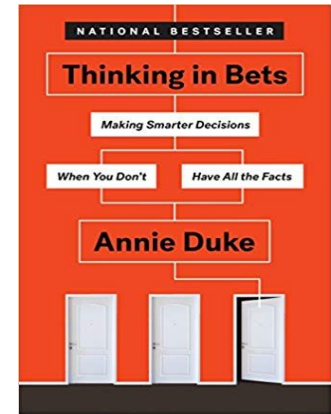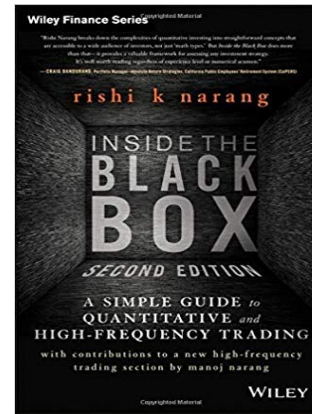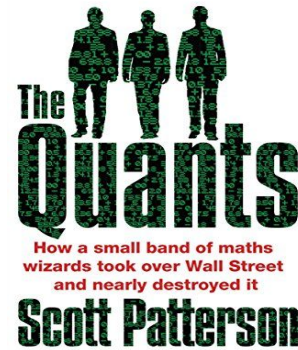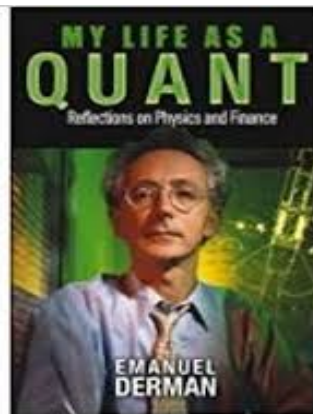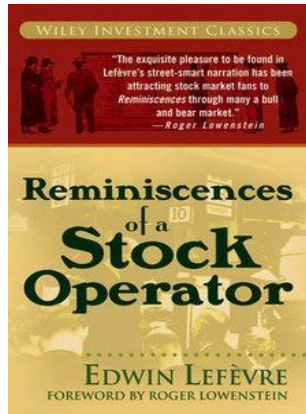
Thank You!
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