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Complexity Risk: A New Risk Category

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About the Author

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Introduction

Investors face a risk that has gone virtually unnoticed, unmentioned, unmeasured, and which from time to time destroys their capital. The risk arises from the complexity of investments. For simplicity's sake, I refer to this as "complexity risk".

Investment complexity is dangerous because it greatly increases the likelihood that investors, advisors, and sometimes even an investment's creator will not fully understand the investment or how it will perform. In short, the more complex an investment is, the more likely it is to be subject to forces that were unanticipated and extremely difficult to predict.

Complexity risk is a completely new way of looking at investment risk. Traditional measures of risk have looked at the historical performance of an investment to measure its volatility. The higher the swings in the investments price, the more risky it is considered. These analyses have also been extended to portfolios of investments to see how baskets of investments behave.

While these measures are still relevant and useful, they cannot address the risks of investments that were recently created and thus have no trading history. This is a significant issue, since many complex investments are created and sold to investors before they begin trading.

Furthermore, even when there is a trading history, the historical price movements of an investment do not reveal the hidden connections that can exist between complex investments. For example, consider an investor who owns five structured products that have completely different underlying investments, but have been issued by the same investment bank. Even though the underlying investments are different, if the issuing bank fails, all five of the investments will go to zero, and years later the investor will be lucky to recover a few cents on the dollar after the bankruptcy has run its course.

This risk would not be revealed in a traditional volatility-based analysis. Indeed, these securities would likely show up as risk reducers because they would be non-correlated with the investor's other investments.

In this paper, I show how investments have become increasingly complex over the past thirty years. I then show how individual investors are highly unlikely to understand complex investments. The reasons lie in the well-established literature of cognitive psychology and economic theory, and are proven by decades of empirical research. I have expanded on this research and applied the same techniques to investment-related issues and documents.

A number of research areas are explored:

- Schema Theory shows how the lack of background knowledge severely limits the amount of information that can be learned from investment documents;
- Readability Statistics show that most investment disclosure documents are written on the graduate or Ph.D. level and riddled with finance, accounting, and legal jargon, making them virtually impenetrable for the layman;
- Digit and Complex Span demonstrate that the average human can only hold about seven concepts in their mind at a time, while most investment disclosure documents require 10 to 20 times that amount to be understood;
- Bounded Rationality recognizes that investors face limitations in: information; cognitive abilities; and time to evaluate investments; and thus typically rely on their advisors;
- Information Asymmetries arise from boundedly rational investors who are then unable to correctly evaluate and price complex investments.

From these analyses, a number of conclusions are drawn:

- Complexity risk is a significant risk factor that heretofore has not been acknowledged or measured;
- Investors should evaluate their portfolios for complexity risk and look to simplify where possible;
- If investors have complex investments, they should ask their advisors to show how they are being compensated for the complexity risk they are taking;

- Licensing requirements for registered representatives and registered investment advisors need to be much more rigorous and should include multiple tiers, where only highly qualified advisors are licensed to sell complex investments;
- Recognizing the fact that most investors are highly unlikely to understand complex investments, disclosure is no longer a sufficient method to protect them. A fiduciary standard is needed, where registered representatives (like registered investment advisors) are charged with looking out for their client's best interests and putting the client's interest ahead of their own.

Separately, my firm has developed a proprietary method for evaluating the complexity risk of an investment. Information about this product can be found at www.bant.am.

Background

Thinking about Investment Risk

Not much has changed in how investors think about investment risk since the invention of Modern Portfolio Theory ("MPT") by Harry Markowitz in 1952. Markowitz showed investors that instead of considering investments individually, they should look at how the investments interact with each other. This thinking can be summarized in one word: diversification.

Since 1952 there has been an explosion in the number and types of investments. In today's finance, investments are created on a daily basis by broker-dealers, banks, and insurance carriers around the world. While each of these new investments is unique, most have one thing in common: a high degree of complexity.

While MPT is still incredibly useful, it is not sufficient to evaluate the risks of the contemporary investment landscape. What is needed is a new risk measure for the complexity of a portfolio to complement MPT. This would enable investors and their advisors to evaluate the likelihood that their portfolio will perform the way they think it will.

Complexity risk is simply the risk that the investor, the financial advisor, or the investment creator, do not completely understand the product they have purchased, recommended, or created. The more complex an investment is, the higher the likelihood that its risks will not be fully understood and that it will behave in ways that are unexpected.

Furthermore, until now, complexity risk has been virtually invisible.

Increasing Complexity of Retail Investments

The number of investments available to retail investors[1] has expanded at an exponential rate over the past 30 years. In the 1970s, the typical retail investor was presented with a very short menu of investment options: individual stocks, bonds and mutual funds. Investments such as hedge funds, private equity funds, and venture capital funds were a small industry and the exclusive domain of institutional investors and the very wealthy. Index funds, structured products and Exchange Traded Products ("ETPs")[2] had not yet been invented.

Exchange Traded Products

A good example of the explosion of new financial products exists in ETPs. NYSE Euronext reported the following data on the accelerating pace of ETP listings:[3]

- 1993-2000: Average of four listings per year from four issuers;
- 2000-2005: Average of 30 listings per year from nine issuers;
- 2006-2010: Average of 174 listings per year from 43 issuers;
- 2011: 304 new ETPs listed from 36 issuers;
- 2012 (through September): 114 new ETPs listed from 24 issuers.

As of year-end 2013, there were 4,731 exchange-traded products globally.[4] Needless to say, this is explosive growth in new products that are now created on almost a daily basis.

Most of these products are complex and when issued, they have no trading history and thus cannot be evaluated using traditional risk metrics.

Direct v. Indirect Investing

Forty years ago, retail investors invested directly in stocks and bonds and institutional investors primarily invested through intermediaries.

In 2013, that has all been reversed. Now only a small fraction of the trading volume on the stock exchanges is done by retail investors.[5] Instead, they are investing through intermediaries such as mutual funds, separate account managers, index funds, ETFs, structured products, and hedge funds, to name a few.

Investing through products or intermediaries may seem a benign or even superior method for individuals to invest, but it increases the complexity risk of the investment. Indeed, the mere packaging of investments into products adds a significant level of complexity to investing. This is simply because the investor not only has to understand the characteristics of the underlying investments, but also those of the investment vehicle itself.

Mutual Funds

A simple example of how investing through an intermediary adds complexity exists with equity mutual funds. In order to understand an investment in an equity mutual fund, the investor has to understand what an equity is as well as how a mutual fund works.

This requires more analysis and a much broader range of knowledge on the part of the investor. Table 1, below, shows the difference in elements that factor into reviews of individual equities and equity mutual funds.

Table 1. Comparison of Elements Involved in Investment Evaluation

INDIVIDUAL EQUITY	EQUITY MUTUAL FUND
Business Model	Size/Style/Sector/Country Dynamics
Economic/Sector Outlook	Economic Outlook
Business Valuation	Market Valuations
	Investment Discipline/Strategy
	Fund Strategy Risk Level
	Fee Structure
	Commissions
	Liquidity Constraints
	Taxes

While there are certainly additional items that could be added to both columns, Table 1 gives a sense of the difference in the additional elements required to understand an equity mutual fund as compared to an individual equity.

This example is particularly telling because most investment professionals would place an equity mutual fund on the simple side of the complexity continuum. However, to the layperson, mutual funds can be beyond their understanding.

Structured Products

As mentioned above, structured products did not exist 30 years ago, but now they represent a large and growing market. For example, leading up to the financial crisis in 2008, total U.S. sales of structured products had grown from around $32 billion to over $100 billion.[6]

From the retail client perspective, structured products and the terms used to describe them are exotic and opaque. In order to, understand them one must understand options and futures pricing, which involves some advanced mathematical and financial aptitude. This fact alone puts structured products beyond the grasp of most retail investors.

However, the potential investor must not only understand the risk and payoff structure of the embedded options or futures in the structured product, they must also evaluate a host of risks that are inherent to the investment vehicle itself. Some of these risks include:

- Credit (Issuer)
- Liquidity
- Leverage
- Interest Rate

Finally, the investor must also undertake an analysis of the underlying investment, just as they would if they were going to invest in it directly.

Thus there are multiple analyses that must be completed in order to evaluate and understand a structured product, including: options and futures pricing, payoff structure, vehicle risks, and underlying investment.

While any one of these tasks requires substantial financial expertise, taken together they require professional level knowledge. Furthermore, because of the complex nature of a structured product, it may be impossible to fully comprehend how different scenarios would affect its price.

For example, a rise in interest rates would effect the embedded option, the issuer, and the underlying investment in different ways and magnitudes. Even an experienced professional would be hard pressed to predict the net effect of such a move on the structured product price.

Disclosure Documents Have Become Longer

A study by Deloitte of 130 companies listed on the London Stock Exchange revealed that over the past 17 years the average annual report length has more than doubled, from 45 pages to 107 pages.[7] Furthermore, Deloitte highlights that banks have consistently had the longest reports, and in 2013 had an average 415 pages.[8]

It would seem that the longer documents have discouraged reading. An IR Web Report cited Google web traffic data that showed investors spend less than five minutes viewing annual meeting materials online.[9] Furthermore, PostRank compiled data that reflected scant investor interest in annual reports as measured by shared links to those reports.[10]

Finally, the International Accounting Standards Board ("IASB") has recognized the increasing complexity of annual reports and is making an effort to reduce their size.

IASB chairman Hans Hoogervorst stated, "the risk is that annual reports become simply compliance documents, rather than instruments of communication."[11] The IASB has recommended a plan to "ditch disclosures that are not 'material', with new guidance to define what is relevant.[12]

As will be discussed below, wading through hundreds of pages of disclosure documents to figure out what is relevant is beyond the abilities of lay investors.

Kolmogorov Complexity

By borrowing a concept from information theory, we can see that longer documents are by their nature more complex. In information theory, the Kolmogorov complexity of an object (frequently a string of numbers, but also texts) can be understood as the length of the shortest possible description of the object.[13]

If the object in question is a company, we can view its annual report as a description of it. If we assume the annual report efficiently describes the company, we can measure the complexity of the company by the length of the annual report. As annual reports have gotten longer, we can infer that the companies they describe have become more complex.

Complicated v. Complex

In order to understand complexity risk, it is important to understand the difference between things that are merely complicated and things that are complex.

Complicated things may have different parts and be incredibly intricate, but the parts all interact with each other in predictable ways; for instance, a watch. Complex things may also have different parts, but they interact with each other in multiple ways, many of which may not be predictable; for instance, an ecosystem.

Other examples of complicated and complex things are: jet engine compared to flight and a car compared to traffic.

Although there are many definitions of complexity, one from systems theory is helpful. A system is considered to be complex if its agents meet four criteria:[14]

- Diversity;
- Connection;
- Interdependence;
- Adaptation.

If we consider the elements of complex investments (underlying investments, issuers, insurers, owners, and ratings agencies, to name a few) to be its agents, then they meet these criteria.

On a more practical level, FINRA Chairman and CEO Richard G. Ketchum, has addressed complex investments in the following way:[15]

> What do we mean by the term "complex product"? Of course, there is no legal definition. I suggest that a basic guide might be the following: **A product might be considered complex if the average retail investor probably will not understand how its features will interact under different market conditions, and how that interaction may affect potential risk and return.** These types of products merit heightened supervision. (Emphasis added)

As will be shown below, the "average retail investor" doesn't have much of a chance in understanding how complex investments work or their potential risks. Indeed, the very nature of complexity is that unanticipated outcomes can occur.

Difficulties in Understanding Complex Investments

Most Retail Investors Don't Understand Investments

The lack of understanding of investments by retail investors has nothing to do with their native intelligence. Indeed, many highly intelligent individuals who have achieved business success and often times have advanced degrees are completely ignorant of how investments work.

The vast majority of retail investors lack the background knowledge and vocabulary to understand investments. For them, listening to investment advisers describe investments and reading disclosure documents, prospectuses and private placement memorandums is like reading obscure academic papers in narrow sub-disciplines.

They can hear or read the words, but the words don't have any meaning.

High intelligence and sophistication in one domain does not translate into investment acumen. As Einstein once said: "The hardest thing in the world to understand is income taxes."[16]

Schema Theory

The failure of domain expertise in one area to transfer to another area has been well studied and comes under the rubric of "Schema Theory." Schema Theory is simply the idea that prior knowledge about a topic provides a framework or structure that helps thinking about that topic.

Two core insights have emerged from research on Schema Theory over the past 40 plus years:

- Background knowledge is critical to understanding.[17]
- Without background knowledge and domain-specific vocabulary, reading comprehension is severely limited.[18]

In short, the more prior knowledge people have about a given topic, the more they can think and learn about it. The lack of prior knowledge greatly limits their ability to think and learn about it. As an example of how prior knowledge plays such a large role in understanding, let us consider two newspaper passages covering different sports. (I have highlighted domain specific words and phrases.)

> It was a crisp game, wrapped tautly around a few key **plays**. The most critical one, the one that sent the largest jolt through the crowd, came in the **bottom of the eighth inning**, when Daniel Murphy **rapped a single** into **center field** to drive in the decisive **run** in the Mets' 2-1 victory at Citi Field.
>
> "I know it's the Yankees, and they're used to playing in these games, and they're used to all this stuff," said Terry Collins, the Mets' manager. "Well, for us, it's a big win. They way we've been going, it's huge for us."
>
> Few things have gone right for the Mets this season, and it appeared at first that they would squander their **eighth-inning** scoring chance. The score was tied at 1-1 and there was one out when Mike Baxter **doubled** and Jordany Valdespin **walked**. The two advanced to **second and third** when **catcher** Chris Stewart dropped a **first-pitch strike** for a **passed ball**.
>
> Baxter tried to score on Ruben Tejada's sharp **grounder** to **second base**, but Robinson Cano made a nifty **stop** and fired **home** to prevent the **run**.
>
> Then came Murphy, to ensure the rally would not go to waste. On a 3-1 count, he **slapped a cutter** from reliever Dave Robertson up the **middle**, sending Valdespin home. As the ball rolled into **center field**, Murphy lifted his **bat** and slammed it on the grass in **foul territory** in celebration. It was a bit of redemption for Murphy, who had been **robbed** of a **home run** earlier.[19]

Most Americans can understand at least part of the story above because it is about baseball and most Americans have some background knowledge about baseball. Compare that to the following passage (again, I have highlighted the domain specific words and phrases):

> In between Finn's **wickets**, Swann struck twice. In his **second over**, Kane Williamson, **moving right across his stumps** in an attempt to get **outside the line**, was beaten by some **sharp turn and given out leg** before by Davis. Williamson called for a review but replays suggested the ball had hit him in line and would have just clipped the top of **leg stump**.

> Hamish Rutherford impressed for a while. He drove a couple of **sweetly-timed fours** off Broad - **first off front and then back foot** - before punching one back past Finn and then **flicking** Swann through **midwicket** for another **four**. But in attempting to play one that **slid on with the arm**, Rutherford was caught at **short-leg** via an **inside edge** and his **pad** by the alert Joe Root.
>
> Later, Swann had Martin Guptill **edging one** that did not **turn**, **caught at slip** off the **outside edge**, before Taylor's fine **innings** was ended by a **full delivery** that may well have deceived the **batsman in the flight**, **beat his drive**, turned and **hit the stumps**. Swann became the first **spinner** to take **eight wickets** in a **Headingley Test** since Derek Underwood did so in 1972. [20]

Most Americans would have no understanding of the passage above. Indeed, many would not be able to identify the sport it is describing. However, it is very similar to the baseball story extract. The baseball story has 23 domain specific words or phrases and the cricket story has 27.

Personally, the only meaning that I can take away from the cricket story is that it is about cricket, and I have played football, baseball, basketball, tennis, volleyball and golf. I also watched the Olympics over the years and have been a regular viewer of ESPN since the late 1980s.

I include this personal anecdote because it illustrates another key fact: even someone with a high level of generic domain experience (in this case sports) will not understand something within that domain if they have no prior knowledge or vocabulary about it (in this case cricket).

Readability

As discussed above, Schema Theory addresses how the lack of background knowledge and vocabulary about investments limits the effectiveness of written and verbal communication to convey meaning.

In addition to Schema Theory, which addresses the complexity of the content of a text, there is an entire scientific discipline used to evaluate the structure of the words and sentences of a text. This discipline studies the readability of a text irrespective of its content.

Although there are many different metrics used to evaluate the readability of a text, the most common count the average number of words per sentence and the average length of words used. The longer the sentences and words used, the less readable the text is, and vice versa.

Evaluating text readability started with the U.S. Navy in the 1950's to evaluate instruction and training manuals, and is used extensively by publishers to evaluate the appropriate grade level for text books, novels and other reading material. These readability measures can be used to evaluate investment disclosure documents.

I am using the Automated Readability Index ("ARI"), which has a readability scale from third grade to college professor levels. The ARI was designed for the U.S. Air Force in 1967 by two Ph.D. researchers, E. A. Smith and R.J. Senter. They describe the motivation behind its creation as follows:[21]

> The Air Force makes extensive use of written materials such as manuals, reports, staff studies, training documents, letters, etc. The readability of a document greatly influences the time required to extract needed information from the document. Likewise, it influences the probability that the information extracted will be correctly understood and used.

To set the scale in context, the two sports stories from above have the following Automated Readability Index levels:

- Baseball story: eighth grade;
- Cricket story: twelvth grade.

Readability of Investment Disclosure Documents

To compare the readability of a relatively simple investment, I have extracted a portion of a risk disclosure from the Blackrock Basic Value Fund prospectus (as before, I have highlighted domain specific terms):

> **Risk** is inherent in all investing. The value of your investment in the Fund, as well as the amount of return you receive on your investment, may fluctuate significantly from day to day and over time. You may lose part or all of your investment in the Fund or your investment may not perform as well as other **similar investments**. The following is a summary description of principal risks of investing in the Fund.
>
> **Equity Securities** Risk — **Stock markets** are **volatile**. The price of **equity securities** fluctuates based on changes in a company's financial condition and overall **market** and **economic conditions**.

> **Foreign Securities** Risk — Foreign investments often involve special risks not present in U.S. investments that can increase the chances that the Fund will lose money. These risks include:
>
> The Fund generally holds its foreign securities and cash in **foreign banks** and **securities depositories**, which may be **recently organized** or new to the **foreign custody business** and may be subject to only limited or **no regulatory oversight**.
>
> Changes in **foreign currency exchange rates** can affect the value of the Fund's portfolio.
>
> The **economies** of certain foreign markets may not compare favorably with the economy of the United States with respect to such issues as growth of **gross national product**, reinvestment of **capital**, resources and **balance of payments position**.
>
> **Market Risk and Selection Risk** — **Market risk** is the risk that one or more markets in which the Fund invests will go down in value, including the possibility that the markets will go down sharply and unpredictably. **Selection risk** is the risk that the securities selected by Fund management will underperform the markets, the **relevant indices** or the securities selected[22]

The Automated Readability Index level for the Basic Value Fund prospectus extract above is the Ph.D. level. Whereas the baseball and cricket stories above were written at the eighth and twelfth grade levels, respectively, the prospectus is written at the nineteenth grade level.

The Basic Value Fund is a mutual fund, one of the more simple types of investments, and yet even this prospectus is written on the Ph.D. level.

In additional research forthcoming from my firm, I have found that almost all investment disclosure documents are written on the graduate or professor level. That is, they are written for individuals who have obtained or are pursuing graduate and Ph.D. degrees.

Needless to say, these documents are beyond the typical investor's reading level.

Like the Air Force, the world of finance makes "extensive use of written materials," including research reports, investment presentations, investment contracts, and disclosure documents. Indeed, disclosure documents are at the heart of how investors are supposed to be protected.

However, the finance industry has not taken the same efforts as the U.S. Air Force to simplify its documents. Table 2, below, shows how almost all of the documents sampled are written at the graduate or Ph.D. level.

Table 2. Readability Statistics of Typical Financial Disclosure Documents[23]

DOCUMENT	INVESTMENT TYPE	AUTOMATED READABILITY INDEX	PERCENT DIFFICULT SENTENCES	PERCENT COMPLEX WORDS	PERCENT DALE-CHALL UNFAMILIAR WORDS
General Electric Annual Report	Common Stock	17.5	56.00%	23.30%	31.00%
KKR Annual Report	Common Stock	19.0	72.20%	28.50%	34.30%
Twitter S-1	IPO Filing	16.0	55.20%	25.30%	29.20%
BlackRock Basic Value Fund Registration Statement	Mutual Fund – Domestic Equity	18.8	59.40%	25.30%	29.20%
BlackRock Enhanced Dividend Achievers Trust Registration Statement	Closed-end Fund – Equity Covered Call Strategy	17.3	57.50%	20.60%	27.80%
Merrill Lynch PreferredPlus Trust Certificates	Trust Originated Preferred Stock – Backed by Qwest Notes	17.7	61.10%	25.90%	29.90%
Merrill Lynch Capital Trust I	Trust Originated Preferred Stock – Backed by Merrill Lynch Notes	19.0	62.20%	23.90%	24.80%
PowerShares DWA NASDAQ Momentum Portfolio	Equity ETF	15.9	51.90%	25.90%	28.90%
Direxion Daily Mid Cap Bull 3X Shares	3X Leveraged ETF	15.5	55.40%	20.00%	24.80%

The high ARI levels, percent difficult sentences, complex and unfamiliar words make this documents a virtual black box. Even highly intelligent and very well-educated people can find typical disclosure documents impenetrable if they are not familiar with business, economics, finance, accounting, or other related fields. This means that investors are relying on their financial advisor to understand a product's risks and rewards, suitability, and how it fits into their overall portfolio.

Schema Theory and Readability Statistics Together

Combining Schema Theory with readability statistics show why disclosure documents are so difficult for the typical retail investor to understand.

Very simply, the typical retail investor lacks the background knowledge and vocabulary to understand the content of what is written. Furthermore how disclosure documents are written and structured makes them incomprehensible and more complex than necessary.

Either one of these characteristics inhibits retail investors' from understanding of disclosure documents. Taken together, they make it virtually impossible. To further illustrate this point, recall the cricket story extract from above. Most American sports fans would not be able to understand what was written. Remarkably, this is true for a story that was written on the twelfth grade level.

Imagine if the same story, with the same domain specific words, had been written on the graduate or PhD level and it becomes obvious how onerous it is for retail investors to understand typical disclosure documents.

Most investors are aware of their ignorance and thus rely upon their broker or investment advisor to read and understand the disclosure documents for them.

Digit and Complex Span

The human brain's capacity to hold ideas is limited. There is a very large body of research on this in the cognitive psychology field. As an area of working memory research, it comes under the aegis of "digit span".

Digit span is the way psychologists measure the ability of working memory to store and recall ideas and facts. For example, if a subject was presented with four numbers and could repeat them back in order, but could not do so with five numbers, their digit span would be four.

The average person has a digit span of seven and most people have a digit span between five and nine, which is why telephone numbers are seven digits long.

This is known as Miller's Law, and is based on one of the most heavily cited papers in the history of cognitive psychology.[24] As Miller wrote:

> … the span of absolute judgment and the span of immediate memory impose severe limitations on the amount of information that we are able to receive, process, and remember

Miller also found that the ability to judge differences between objects is limited as well. For example, the ability of subjects to distinguish between auditory tone, auditory loudness, the saltiness of water, and the position of points on an interval tends to plateau at four and decline thereafter.[25]

Since the 1950s, research on working memory has expanded to include many other versions of digit span. One of these is known as "complex span". It tasks subjects with recalling objects (as in the digit span test), while processing separate tasks at the same time. (For example, solving a simple math problem.)

As could be expected, recall is worse in complex span than in simple span tests. The ability to remember things declines when subjects have to process other tasks at the same time.[26]

The research on digit and complex span can be applied to understanding complex investments. An investor tasked with understanding a prospectus is faced with having to potentially hold hundreds of objects in their mind simultaneously while also having to process different kinds of mathematical, financial, and economic problems.

As an example of this task, I have mapped parts of a variable universal life insurance contract that apply to taking a policy loan (see next page). The defined terms are in red.

Importantly, all the defined terms would need to be simultaneously held in the investor's mind to understand how policy loans work. Furthermore, understanding the entire map is required to understand the first sentence. To make the task more daunting, many of the terms are circular, meaning that the term is used in its own definition – a logical fallacy.

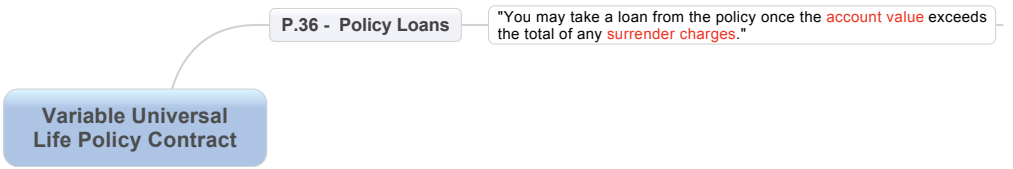
Reading a prospectus is a complex span task. It is also many orders of magnitude harder than having to recall a sequence of letters while also doing simple math problems.

The problem for investors is that the delivery of a prospectus is a key component of disclosure obligations for registered representatives and investment advisors. However, if investors cannot understand the prospectus, then this is not sufficient to protect them. They are forced to rely on their financial advisor to understand the investment for them and to judge the investment's risk and suitability.

Highly Educated Investors Often Don't Understand Even Simple Investments

In a study on investor literacy conducted by the National Bureau of Economic Research ("NBER"), researchers from Yale, Harvard, and the University of Pennsylvania found that even MBA students at Wharton and Harvard College undergraduates could not pick the best index mutual fund when given prospectuses for different funds.[27]

Figure 1. Can You Understand One Sentence of a Variable Universal Life Contract?



Note: P.4 Index of Special Terms: "We have tried to make this prospectus as readable and understandable for you as possible. By the very nature of the policy, however, certain technical words or terms are unavoidable. We have identified the following as some of these words, or terms. The page that is indicated here is where we believe you will find the best explanation for the word or term."

Figure 2. The First Three Levels of References

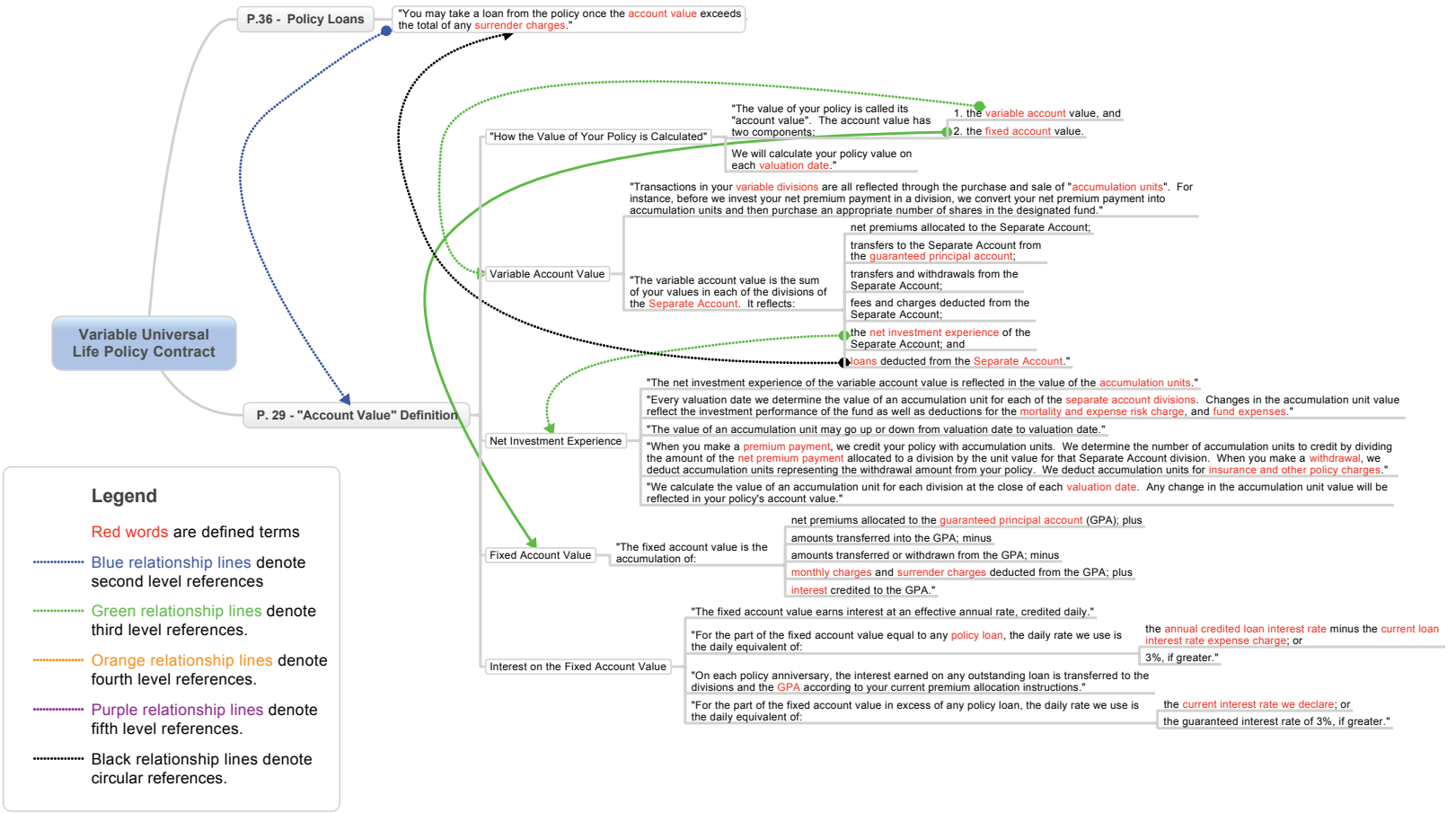
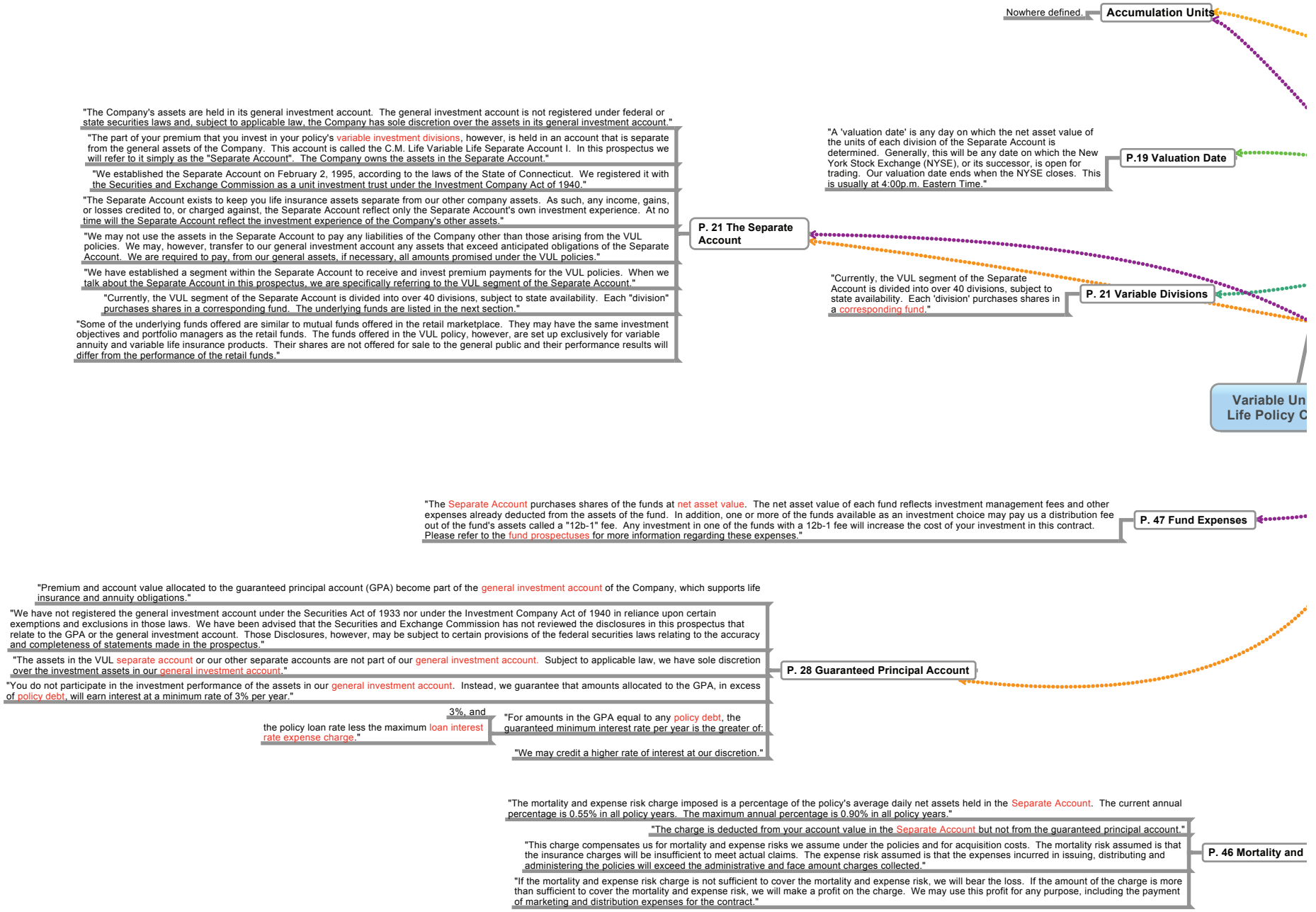
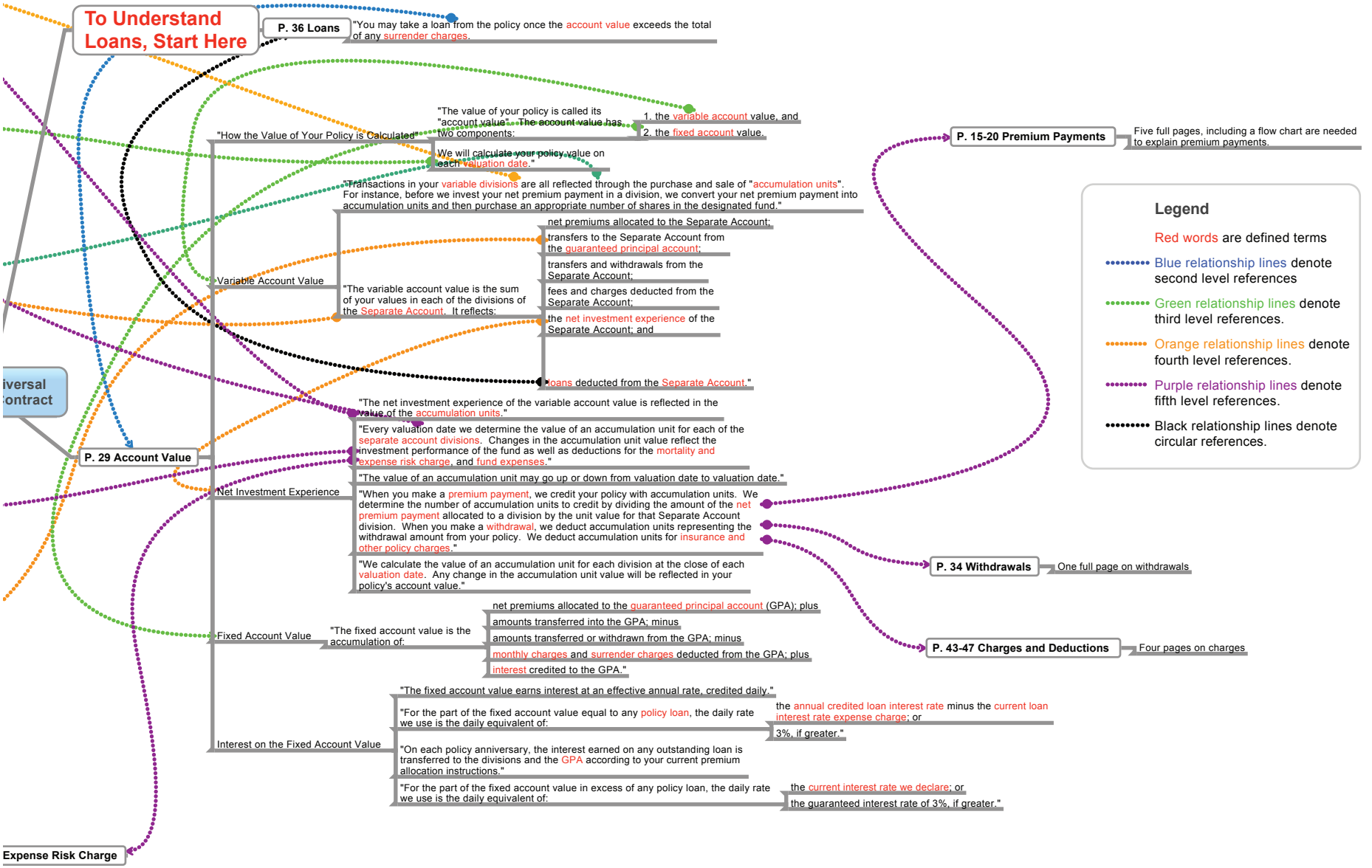


Figure 3. The First Five Levels of References




To Understand Loans, Start Here
P. 36 Loans
"You may take a loan from the policy once the account value exceeds the total of any surrender charges.
"How the Value of Your Policy is Calculated"
"The value of your policy is called its "account value". The account value has two components:
1. the variable account value, and
2. the fixed account value.
We will calculate your policy value on each valuation date."
"Transactions in your variable divisions are all reflected through the purchase and sale of "accumulation units". For instance, before we invest your net premium payment in a division, we convert your net premium payment into accumulation units and then purchase an appropriate number of shares in the designated fund."
Variable Account Value
"The variable account value is the sum of your values in each of the divisions of the Separate Account. It reflects:
net premiums allocated to the Separate Account;
transfers to the Separate Account from the guaranteed principal account;
transfers and withdrawals from the Separate Account;
fees and charges deducted from the Separate Account;
the net investment experience of the Separate Account; and
loans deducted from the Separate Account."
iversal ontract
P. 29 Account Value
"The net investment experience of the variable account value is reflected in the value of the accumulation units."
"Every valuation date we determine the value of an accumulation unit for each of the separate account divisions. Changes in the accumulation unit value reflect the investment performance of the fund as well as deductions for the mortality and expense risk charge, and fund expenses."
"The value of an accumulation unit may go up or down from valuation date to valuation date."
Net Investment Experience
"When you make a premium payment, we credit your policy with accumulation units. We determine the number of accumulation units to credit by dividing the amount of the net premium payment allocated to a division by the unit value for that Separate Account division. When you make a withdrawal, we deduct accumulation units representing the withdrawal amount from your policy. We deduct accumulation units for insurance and other policy charges."
"We calculate the value of an accumulation unit for each division at the close of each valuation date. Any change in the accumulation unit value will be reflected in your policy's account value."
Fixed Account Value
"The fixed account value is the accumulation of:
net premiums allocated to the guaranteed principal account (GPA); plus
amounts transferred into the GPA; minus
amounts transferred or withdrawn from the GPA; minus
monthly charges and surrender charges deducted from the GPA; plus
interest credited to the GPA."
Interest on the Fixed Account Value
"The fixed account value earns interest at an effective annual rate, credited daily."
"For the part of the fixed account value equal to any policy loan, the daily rate we use is the daily equivalent of:
the annual credited loan interest rate minus the current loan interest rate expense charge; or
3%, if greater."
"On each policy anniversary, the interest earned on any outstanding loan is transferred to the divisions and the GPA according to your current premium allocation instructions."
"For the part of the fixed account value in excess of any policy loan, the daily rate we use is the daily equivalent of:
the current interest rate we declare; or
the guaranteed interest rate of 3%, if greater."
Expense Risk Charge
P. 15-20 Premium Payments
Five full pages, including a flow chart are needed to explain premium payments.
P. 34 Withdrawals
One full page on withdrawals
P. 43-47 Charges and Deductions
Four pages on charges
Legend
Red words are defined terms
Blue relationship lines denote second level references
Green relationship lines denote third level references.
Orange relationship lines denote fourth level references.
Purple relationship lines denote fifth level references.
Black relationship lines denote circular references.

This is striking because every index fund had the exact same holdings, and is thus a commodity. The only substantive difference between such funds is the expense ratio. Thus the primary analysis that needed to be done was to compare the expense ratios of the funds and choose the cheapest one.

However, these Ivy League students failed to comprehend this simple difference and to make an elementary comparison. There is no doubt that they were intelligent enough to carry out this basic analysis. The average SAT scores for Wharton MBA students was 1453, placing them in the 98th percentile, nationally. The Harvard undergraduates' average SAT score was 1499, placing them in the 99th percentile. Furthermore, their financial literacy was measured directly and found to be higher than the typical American investor.[28]

Despite their exceptional intelligence and above average financial literacy, these students failed spectacularly at elementary understanding and evaluation of index funds. Some of the NBER study results include:[29]

- The Harvard undergraduates ranked fees as only the eighth most important factor (out of 11), and the mean management fee of the funds they picked was 122 basis points[30] above the possible minimum fee;
- The Wharton MBA students ranked fees as the most important factor in index fund selection, but remarkably, were unable to choose the least expensive fund. Their average fee was 112 basis points above the possible minimum;

When provided with fee summary sheets, neither the Wharton MBA students nor the Harvard undergraduates spotted the ones with the lowest fees. The authors of the NBER study concluded: "Our results support a growing body of evidence that individual investors are not well-equipped to make optimal asset allocation choices in the current regulatory environment."[31]

Many Registered Representatives Don't Understand What They are Selling

The difficulties in understanding investments outlined above are not limited to retail investors. Investments have become so complex that even industry insiders don't understand them.

An example of this exists with leveraged and inverse exchange traded funds ("ETFs"). The first ETF was introduced in 1990 on the Toronto Stock Exchange[32] and three years later the idea came to America, with the first domestic ETF based on the S&P 500 index.[33] ETFs have had exponential growth in popularity over the years, with assets growing from $1 billion in 1995 to $66 billion in 2000, $608 billion in 2007, and $1,048 billion in 2011.[34] As of September 30, 2012, there were 3,297 different ETFs globally.[35]

Registered representatives' broad adoption of ETFs helped drive their phenomenal asset growth. This growth can be attributed to many factors, including their relative simplicity as investments products when the first debuted.

However, when leveraged and inverse ETFs were introduced, they were generally misunderstood by registered representatives and subsequently misused, resulting in massive losses and lawsuits.

In response to the widespread misuse of leveraged and inverse ETFs, the Financial Industry Regulatory Authority, Inc. ("FINRA") issued Regulatory Notice ("RN") 09-31 in June 2009. This RN stated:

> … (these products) are highly complex financial instruments that are typically designed to achieve their stated objectives on a daily basis. Due to the effects of compounding, their performance over longer periods of time can differ significantly from their stated daily objective. Therefore, inverse and leveraged ETFs that are reset daily typically are unsuitable for retail investors who plan to hold them for longer than one trading session, particularly in volatile markets.[36]

Many Registered Representatives who were familiar with unleveraged, long-only, ETFs had bought and held the leveraged and inverse ETFs, under the mistaken belief that they were essentially the same as the traditional versions. This assumption was wrong. Whereas the traditional ETFs were appropriate for a buy and hold strategy, the leveraged and inverse ETFs were not meant to be held for longer than one day.

They did not understand what they were selling and so thousands of customers suffered losses.[37]

This episode in misunderstood and thus unsuitably sold investments emphasizes the nature of complexity risk: even an investment professional that understands one type of investment may not understand a very similar type of investment.

Sophisticated Investors Often Don't Understand Complex Investments

In addition to retail investors and financial advisors not understanding complex investment, there are many instances of sophisticated investors falling into the same predicament. The most glaring case of this may be from the credit crises that came to a climax in 2008/2009.

It appears that many sub-prime mortgage underwriters were duping the ratings agencies. As attorney Phillipe Selendy writes:

> But the evidence is rising that certain arranging banks were valuing and structuring CDOs and CDS internally on the basis of models that fundamentally conflict with the ratings-based cash-flow models on which the deals were sold—specifically, with the arranging banks rejecting the very ratings measures that the banks had represented as indicative of the credit quality of the transactions, without disclosing this to investors. This potential problem of two sets of models—and two sets of books—arises from inherent limitations in the rating agency methodologies that apparently were known to and exploited by certain arranging institutions.[38]

Setting aside issues of rating agency culpability, it would appear that mortgage originators were able to game the system and get AAA ratings on collateralized debt obligations ("CDOs") of sub-prime mortgages by exploiting misunderstandings by the ratings agencies.

The ratings agencies' business is understanding and evaluating CDOs and other investment products and securities. Their employees are some of the most well-versed, experienced, and educated investment professionals on the planet. Indeed, here is how the largest ratings agencies describe their human capital:

Standard & Poor's[39]

> Across 23 offices around the world, we have 1,400+ analysts, managers and economists continually assessing the variables that affect creditworthiness. In frequent dialogue with senior managers and industry leaders, we examine everything from the state of an enterprise and its position in its industry, to the state of a region and the globe.

Moody's[40]

> Moody's is an essential component of the global capital markets, providing credit ratings, research, tools and analysis that contribute to transparent and integrated financial markets… The Corporation, which reported revenue of $3.0 billion in 2013, employs approximately 8,400 people worldwide and maintains a presence in 31 countries.

Fitch Ratings[41]

> People are our greatest asset and are the cornerstone of our business. That's why we place high importance on integrity and objectivity, and rely heavily on the diverse skills and backgrounds of our people to deliver solid credit opinions. Analytical groups from multiple sectors, industries and regions work closely together to foster a work environment that inspires open communication and teamwork.

And yet even the ratings agencies, with thousands of economists, analysts and other experts, fundamentally misunderstood the products they had been evaluating for decades.

This conclusion appears to have been confirmed by at least one ratings agency, which, in response to litigation over AAA ratings given to sub-prime CDOs, essentially claimed that it didn't know what it was doing. As BloombergBusinessweek reported:[42]

> "The Justice Department alleges that S&P knowingly inflated its AAA ratings to earn more business from major banks that hired it to rate their complicated real estate-related securities. **S&P counters that it honestly, if often incompetently, failed to anticipate that the instruments in question–CDOs, RMBSs, and so forth–would lose value when the housing market tanked."** (Emphasis added)

If investment products are too complex for even the ratings agencies to understand, how can a retail investor be expected to understand them?

Licensing Requirements Have Not Kept up with the Increasing Complexity of Investments

One reason why financial professionals have trouble understanding complex investments is that they are not trained properly for them. In particular, the licensing requirements for registered representatives and investment advisors have not changed significantly while the investment landscape has.

One way to quantify how much the licensing requirements have changed is to use a simple text mining analysis of keywords between documents. This technique excludes prepositions and articles of two texts and compares the remaining keywords between them. A simple similarity statistic measures the number of keywords they have in common. The higher the percentage, the higher the similarity between the texts.

Most texts, even if on the same subject, have very little similarity. Stories about the Russian military involvement in the Ukraine filed on the same day by the New York Times and the Wall Street Journal had a similarity of 12 percent. Likewise, two stories by the New York Times and the Washington Post about President Obama's budget proposal had a similarity of 18 percent.

Remarkably, the training materials for registered representatives (Series 7) and investment advisors (Series 65) have remained similar over time. For example, the NASAA Series 65 Exam Specifications had a similarity of 27 percent from 2004 to 2010; and the NYSE Series 7 Study Guide had a similarity of 33 percent from 1995 to 2012.

One exception is the CFA Exam, which is constantly reviewed and revised to keep up with the changing investment landscape.[43] From 1969 to 2010, the CFA Topic Outline had only a 10 percent similarity. These findings are summarized in Table 3, below:

Table 3. Similarity Between Topics on Regulatory Exams and Other Texts

DOCUMENT	PUBLISH DATE	COMPARATIVE DOCUMENT	PUBLISH DATE	SIMILARITY OF KEYWORDS
Obama Budget - NYTs[44]	3/4/14	New York Yankees - NYTs[45]	3/4/14	4%
Russia-Ukraine - NYTs[46]	3/4/14	Russia-Ukraine - WaPo[47]	3/4/14	12%
Obama Budget - NYTs[48]	3/4/14	Obama Budget - WaPo[49]	3/4/14	18%
CFA Topic Outline[50]	1969	CFA Topic Outline[51]	2010	10%
NASAA Series 65 Exam Specifications[52]	2004	NASAA Series 65 Exam Specifications[53]	2010	27%
NYSE Series 7 Study Guide[54]	1995	FINRA Series 7 Study Guide[55]	2012	33%

This evidence indicates a lack of evolution in the training of registered representatives and investment advisors. The investment landscape has undergone wholesale changes in the last 20 years and continues to evolve at a faster pace. If licensing exams are not keeping up with these developments, then investors (and advisors) are at great risk.

Ignorance and investments don't mix well, and the combination typically ends badly.

Another way to evaluate the licensing requirements for financial advisors is to compare the work and education requirements and length of time it takes to prepare for the tests. This comparison is made in Table 4, below:

Table 4. Comparison of Requirements and Test Preparation for Designations

DESIGNATION	DESCRIPTION	WORK REQUIREMENT	EDUCATION REQUIREMENT	TIME TO COMPLETE TEST PREPARATION COURSES
Series 7 License[56]	Registered Representative	0	0	3-5 weeks
Series 65 License[57]	Investment Advisor	0	0	3-5 weeks
Life Insurance License[58]	Life Insurance Sales	0	0	4 days
CLU[59]	Chartered Life Underwriter	3 years	0	2 years
CFP[60]	Certified Financial Planner	3 years	College degree	9 months
CFA[61]	Chartered Financial Analyst	4 years	College degree	4 years

This analysis reveals a wide disparity in the work experience, educational levels, and preparation required to earn various licenses and designations. The lack of education, work requirements and studying required for the securities and insurance licenses shows how relatively little background training and knowledge is required.

The low rate of adaptation of test content to changes in the investment landscape, and the narrow scope of securities licensing exams, points to serious deficiencies in financial advisors' training and qualifications. As we have discussed above, the ubiquity of ETPs, hedge funds and other alternative investments, structured products, and securitization, has led to an explosion of investment complexity.

However, securities licensing has not kept up.

Increased Qualification and Training Requirements for All Advisors

As discussed above, qualification and training requirements for financial advisors have not kept up with the exploding complexity of investments. While the investment world often claims to be a profession, the process of entering it resembles nothing like the medical or legal world.

Something like the CFA process is required if advisors are to understand the complex investments they are selling. A tiered model would be easy to implement and might resemble the many levels of qualifications in the medical field, such as:[62]

- Surgeon
- Surgeon's Assistant
- Resident
- Physician's Assistant
- Registered Nurse
- Nurse Practitioner

If such a model were adopted, those entering the field could learn in apprentice positions as they became certified, while those who did not wish to recommend complex investments would not need as much advanced training.

Regulatory Responses to Complex Investments

The increase in investment complexity has not gone unnoticed by the regulators. In particular, the SEC and FINRA have both responded by (respectively) reorganizing the Enforcement Division and issuing a number of Regulatory Notices to member firms.

The Securities Exchange Commission

The reorganization of the SEC Enforcement Division was announced by Robert Khuzami on January 13, 2010.[63] It was the most significant reorganization since the Divisions establishment in 1972.

The phenomenon of increasing investment complexity is woven throughout the announcement and is one of the primary drivers of the restructuring. The SEC announcement included the following:[64]

> The Division named leaders of national specialized units it has established in five priority areas dedicated to particular **highly specialized and complex** areas of securities law.
>
> These units and the new office will help provide the additional structure, resources, and expertise necessary for enforcement staff to keep pace with **ever-changing markets** anymore comprehensively investigate **cases involving complex products, markets, regulatory regimes, practices and transactions**.
>
> Two great challenges face every enforcement authority policing our securities markets - the **complexity and high-velocity pace of innovation in financial products, transactions, and markets**, and the willingness of violators to use every trick to cover their tracks.
>
> **These specialized units address both challenges through improved understanding of complex products and markets**, earlier and better capability to detect emerging fraud and misconduct, great capacity to file cases with strike-force speed, and an increase in expertise throughout the Division.
>
> Through enhanced training and improved access to specialists, unit members will obtain increased understanding of particular markets, products and transactions. (Emphasis added)

These extracts show financial products had grown so complicated that the SEC could no longer effectively monitor them.

The Financial Industry Regulatory Authority

FINRA has responded to increasingly complex investments by issuing Regulatory Notices ("RNs") to member firms.[65] These RNs provide guidance to Broker-Dealers ("BDs") by educating them about new and/or complex products, past abuses with their sales, and ways to supervise them. Some of these RNs have included:

- 03-07. Hedge Funds.

- 03-71. Non-Conventional Investments
- 05-50. Equity-Indexed Annuities
- 05-59. Structured Products.
- 09-31 Leveraged and Inverse ETFs.
- 09-73 Principal Protected Notes.
- 10-09. Reverse Exchangeable Securities.
- 10-51. Commodity Futures-Linked Securities.
- 10-22. Regulation D Offerings.
- 12-03. Complex Investments.

FINRA RN 12-03 - Complex Investments, offers the most comprehensive view of FINRA's position. Most importantly, FINRA identifies complexity as a source of investment risk:[66]

> **The fact that a product is "complex" indicates that it presents an additional risk to retail investors because its complexity adds a further dimension to the investment decision process beyond the fundamentals of market forces…** Regulators have expressed concern about complex products because the intricacy of these products can impair the ability of registered representatives or their customers to understand how the product will perform in a variety of time periods and market environments, and can lead to inappropriate recommendations and sales. (Emphasis added)

RN 12-03 also identifies some types and characteristics of complex products, including:[67]

- Asset-backed securities that are secured by a pool of collateral such as mortgages, payments from consumer credit cards or future royalty payments on popular music;
- Products that include an embedded derivative component;
- Products with contingencies in gains or losses, particularly those that depend upon multiple mechanisms, such as the simultaneous occurrence of several conditions across different asset classes;
- Structured notes with "worst-of" features, which provide payoffs that depend upon the worst performing reference index in a pre-specified group;
- Investments tied to the performance of markets that may not be well understood by many investors;
- Products with principal protection that is conditional or partial, or that can be withdrawn by the product sponsor upon the occurrence of certain events;
- Product structures that can lead to performance that is significantly different from what an investor may expect, such as products with leveraged returns that are reset daily;
- Products with complicated limits or formulas for the calculation of investor gains.

FINRA further elaborates that any product could be considered complex "if it would be unreasonable to expect an average retail investor to discern the existence of these features and to understand the basic manner in which these features interact to produce an investment return."[68]

The lack of background knowledge (schema theory), the difficulties of reading disclosure documents (ARI), and the limits of the human mind to hold multiple concepts at once (complex span) confirm that most products would qualify as complex under the FINRA "unreasonable" standard.

Economists Response to Complexity

Neoclassical economics begins by making some heroic assumptions, including that:

- market information is perfect;
- agents are rational.

The assumption of perfect information implies that both buyers and sellers have access to, and understand all, the material information about the item being transacted. The assumption of rationality can be generally understood to mean that individual actors in an economy are simply looking to maximize their utility (i.e. their preferences).

These assumptions have been dealt a number of death blows over the years, most notably by Herbert Simon[69] and Daniel Kahneman,[70] both winners of the Nobel Prize in Economics.

Herbert Simon's "Bounded Rationality"

In 1957, Herbert Simon coined the term "bounded rationality" in a book entitled "Models of Man". Bounded rationality is simply a recognition of the reality that the "rationality" of individual is limited by a number of factors, including:[71]

- the information they have;
- the cognitive limitations of their minds;
- the amount of time they have to make a decision.

Simon wrote that, "boundedly rational agents experience limits in formulating and solving complex problems and in processing (receiving, storing, retrieving, transmitting) information".[72]

This should sound familiar to readers of this paper.

When faced with bounded rationality (where they lack the information, ability, and resources to compute the optimal decision) Simon believed that individuals resort to the use of heuristics (i.e. rules of thumb or standard operating procedures) to make decisions. Simply put, these heuristics allow the economic agent to avoid their lack of information, computational ability, and time, and to greatly simplify their options.

While this may be close to optimal for getting dressed in the morning, it can lead to disaster when investing. When a boundedly rational investor is faced with a complex investment, the most common heuristic is to trust their advisor. This is fraught with danger for at least two reasons:

- The more complex an investment, the less likely the advisor is to fully understand it, (as discussed in the Leveraged and Inverse ETF section, above) and;
- Complex investments are almost always more lucrative for the advisor, thus there is a perverse incentive for the advisor to build a portfolio which the investor cannot understand.

Information Asymmetries

More recent economic work has focused on the problem of imperfect information and typically comes under the aegis of "information asymmetry". Information asymmetries exist in transactions when one party has more information about the goods being transacted than the other.

Typically, the seller of a product will have more information than the buyer. This allows them to know the true value of the product and can thus get a better price. These asymmetries exist in complex financial products even for sophisticated institutional investors. For example, hedge fund manager John Paulson was able to have Goldman Sachs create a toxic product that was sold to two banks: IKB and ABN Amro. Reuters summarized the fact pattern from the SEC fraud complaint against Goldman in five steps:[73]

> 1) Hedge fund manager John Paulson tells Goldman Sachs in late 2006 he wants to bet against risky subprime mortgages using derivatives. The risky mortgage bond that Paulson wanted to short were essentially subprime home loans that had been repackaged into bonds. The bonds were rated "BBB," meaning that as the home loans defaulted, these bonds would be among the first to feel the pain.
>
> 2) Goldman Sachs knows that German bank IKB would potentially buy the exposure that Paulson was looking to short. But IKB would only do so if the mortgage securities were selected by an outsider.

> 3) Goldman Sachs knows that not every asset manager would be willing to work with Paulson, according to the complaint. In January 2007, Goldman approaches ACA Management LLC, a unit of a bond insurer.
>
> ACA agrees to be the manager in a deal, and to help select the securities for the deal with Paulson. In January and February 2007, Paulson and ACA work on the portfolio, coming to an agreement in late February.
>
> Goldman never tells ACA or other investors that Paulson is shorting the securities, and ACA believes that Paulson in fact wanted to own some of the riskiest parts of the securities, according to the complaint.
>
> 4) Goldman puts together a deal known as a "synthetic collateralized debt obligation" designed to help IKB and Paulson get the exposure they want. IKB takes $150 million of the risk from subprime mortgage bonds in late April 2007. ABN Amro takes some $909 million of exposure as well, and buys protection on its exposure from ACA Management affiliate ACA Financial Guaranty Corp in May 2007.
>
> **Goldman's marketing materials for the deal never mention Paulson's having shorted more than $1 billion of securities.** Goldman receives about $15 million in fees.
>
> 5) Months later, IKB loses almost all of its $150 million investment. In late 2007, ABN is acquired by a consortium of banks including Royal Bank of Scottland. In August 2008, RBS unwinds ABN's position in ABACUS by paying Goldman $840.1 million. Most of that money goes to Paulson, who made about $1 billion total. (Emphasis added)

The fact of John Paulson's involvement in the creation of the ABACUS deal was material, and it's non-disclosure represented an information asymmetry for IKB and ABN Amro, the purchasers.

Disclosure and Complex Investments

Since Securities Act of 1934, one of the cornerstones of protecting investors has been disclosure. Originally, the disclosure rules were aimed at ending the widespread insider trading and other types of self-dealing that had theretofore been permitted. As justice Louis Brandeis is noted for saying:[74]

> Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman.

However, given the realities of bounded rationality and information asymmetries, and the increasing complexities of investments, disclosure is not sufficient. As Princeton economist Markus K. Brunnermeier has written:[75]

> … more information *per se* does not help investors make well-informed investment and risk management decisions. This is because simply increasing the quantity of information disclosed can lead to *information overload* – a boundedly rational investor who receives an entire truckload of documents will be overwhelmed by the amount of information he needs to distill. (Emphasis in the original)

Indeed, I have seen investment portfolios which, over a period of time, have owned over 400 structured products. Assuming 200 pages per prospectus, would entail reading over 80,000 pages of documents – a full time job. This highlights both the information overload mentioned by Brunnermeier, the computational costs highlighted by Simon, and ultimately the information asymmetry experienced by the buyer of the products.

I believe this, and all the issues facing investors when trying to understand complex investments, argues for a fiduciary standard for registered representatives (and which already exists for investment advisors).

The Return of the "Customer's Man" in a Fiduciary Standard

Because of the complexity of modern investments, registered representatives should be held to a fiduciary standard, which is not a radical idea. Indeed, the idea has a long history in the brokerage world, although under a different name. Up until the mid-1970s, a registered representative that put the client's interest first was known as a "customer's man."[76] Within the industry, it meant that the registered representative was working for the client, not his broker-dealer.

This term of art was not a legal standard, nor was it memorialized in any industry rules or regulations, but it evidenced a mindset of putting the clients interests first, a core component of a fiduciary standard.[77]

I believe a fiduciary standard for registered representatives would merely formalize this august concept, which, in my experience, is still practiced by many in the industry today.

While a formal fiduciary standard would be new for registered representatives, I believe it would not necessitate a change in the way most registered representatives do business.

Currently, FINRA requires that all recommendations to customers be suitable. Importantly, this is true irrespective of the client's individual level of understanding. Indeed, it is very likely that the majority of retail brokerage clients are compelled to use a registered representative precisely because of their own ignorance about investment matters.

Furthermore, the majority of customers think they are getting fiduciary advice from their registered representative. As the SEC commissioned Rand Report stated:

> Our results show that most survey respondents and focus-group participants do not have a clear understanding of the boundaries between investment advisers and broker-dealers. Even those who have employed financial professionals for years are often confused about job titles, types of firms with which they are associated, and the payments they make for their services. Respondents and participants also understand relatively little about the legal distinctions between investment advisers and broker-dealers.[78]

These results echo the findings above. Investors generally do not understand complex investment products nor the legal distinctions between investment advisors and broker-dealers.

Given the general lack of understanding of these two key elements, I believe a fiduciary standard for registered representatives would greatly benefit both them and their customers. It would establish the standard of care between investment advisors and broker-dealers and would protect the vast majority of investors, who do not understand investments.

Conclusion

Complexity represents an unnecessary risk for investors. Indeed, the returns of most complex investments can be approximated (if not exceeded) by their more simple counterparts.

Furthermore, the mere fact that complexity risk has not been recognized has led to investors not being compensated for taking it. This is especially pernicious since complexity risk is, in many ways, unquantifiable.

Complexity risk is pervasive in the investments of almost all individuals and institutions, regardless of sophistication. While all the individual risks that complexity gives rise to are essentially impossible to calculate, how complex an investment is can be determined.

Indeed, my firm has developed a proprietary method for determining the complexity of individual investments and portfolios of investments.

Since complexity risk has heretofore not been clearly articulated or understood, investors and regulators have not fully incorporated it into their thinking. Once the systemic nature of complexity risk has been recognized, three needed changes become obvious:

- Investors should evaluate the complexity of their portfolios and then try to simplify them;
- The qualification and training requirements for registered representatives and investment advisors should be much more rigorous for all advisors, and only the most well qualified should be allowed to recommend complex products;
- Registered representatives, like their investment advisor counterparts, should be subject to a fiduciary standard.

Endnotes

1 I use "retail investors" to distinguish individual investors from institutional investors. Importantly, retail investors include high net worth investors, because the mere fact of having money does not convey understanding or sophistication about investments. This fact is sadly borne out by the great many high net worth investors who have lost their fortunes on bad investments or swindles.

2 ETPs include exchange traded funds ("ETFs") and exchange traded notes ("ETNs").

3 NYSE Euronext. Exchange Traded Products Innovation, Laura Morrison presentation at the 2012 SIFMA Complex Products Forum, September 27, 2012. Available at http://www.sifma.org/uploadedfiles/events/2012/complex_products_forum/exchange-traded-products-innovation.pdf?n=92651; Accessed April 25, 2014.

4 "Exchange Traded Funds: Twenty years young", The Economist; January 26, 2013; Available at http://www.economist.com/news/finance-and-economics/21570711-anniversary-successful-financial-innovation-twenty-years-young; Accessed May 8, 2014.

5 Davis, Alicia J. "A Requiem for the Retail Investor?" Va. L. Rev. 95, no. 4 (2009): 1105-29. "The American retail investor is dying. In 1950, retail investors owned over 90 percent of the stock of U.S. corporations. Today, retail investors own less than 30 percent and represent a very small percentage of U.S. trading volume… recent New York Stock Exchange data reveal that trades by individual investors represent, on average, less than two percent of NYSE trading volume for NYSE-listed firms." (Notes omitted.)

6 SEC Staff Summary Report on Structured Products, July 27, 2011; 2. Available at http://structuredproducts.org/wp-content/uploads/2011/07/SEC-Summary-Report-on-Sales-of-retail-Structured-Products-27-July-2011.pdf; Accessed April 17, 2014.

7 Deloitte LLP. A new beginning: Annual report insights 2013; 21. Available at http://www.deloitte.com/assets/Dcom-UnitedKingdom/Local%20Assets/Documents/Services/Audit/uk-audit-a-new-beginning-printer-friendly-13.pdf; Accessed April 21, 2014.

8 *Id.* at 22.

9 IR Web Report. Investors spend just five minutes on annual reports – stats. Dominic Jones; May 12, 2011. Available at http://irwebreport.com/20110512/investors-5-minutes-annual-reports/; Accessed April 23, 2014.

10 *Id.*

11 Reuters. Time to declutter annual reports, says accounting rule setter. June 27, 2013. Available at http://www.reuters.com/article/2013/06/27/accounting-iasb-idUSL5N0F31ST20130627; Accessed April 23, 2014.

12 *Id.*

13 Wikipedia, s.v. "Kolmogorov complexity". Available at http://en.wikipedia.org/wiki/Kolmogorov_complexity; Accessed April 24, 2014. Kolmogorov complexity is named after Andrey Nikoaevich Kolmogorow (1903-1987), a Soviet mathematician.

14 Scott E. Page, Understanding Complexity: Course Guidebook. The Great Courses (2009); 4.

15 Richard G. Ketchum, Speech at the SIFMA Complex Products Forum, September 27, 2012. Available at http://www.finra.org/Newsroom/Speeches/Ketchum/P180112; Accessed April 24, 2014.

16 Wikiquote, Albert Einstein; Attributed by Leo Mattersdorf. Available at http://en.wikiquote.org/wiki/Albert_Einstein. Accessed February 4, 2014.

17 Fisher, D. and Frey, N. (2009). Background knowledge: The missing piece of the comprehension puzzle. Portsmouth, NH. Heinemann.

18 Stahl, S. A., Hare, V. C., Sinatra, R., and Gregory, J. F. (1991). Defining the role of prior knowledge and vocabulary in reading comprehension: The retiring of number 41. Journal of Reading Behavior, 23, 487-508.

19 New York Times, Mets Win an Opener Light of Fans and Runs, 5/27/13, by Andrew Keh. Available at http://www.nytimes.com/2013/05/28/sports/baseball/mets-win-opener-light-on-fans-and-runs.html?ref=baseball, accessed May 28, 2013.

20 ESPNcricinfo by George Dobell. 5/27/13. "Swann Leaves New Zealand on Brink of Defeat". Available at http://www.espncricinfo.com/england-v-new-zealand-2013/content/story/638039.html. Accessed 5/28/13.

21 E. A. Smith and R.J. Senter, Automated Readability Index; (1967); 1. Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDYQFjAB&url=http%3A%2F%2Fwww.dtic.mil%2Fcgi-bin%2FGetTRDoc%3FAD%3DAD0667273&ei=k7wQU9W5HO-u0AH464DwBA&usg=AFQjCNExZ8a2RTg8GucWY2IUXB2LN1ezrg&sig2=He5j3DAUr_YXsYQKoR_PQQ&bvm=bv.61965928,d.dmQ; Accessed February 28, 2014.

22 Basic Value Fund Prospectus, Dated October 26, 2012. Available at https://www2.blackrock.com/us/financial-professionals/literature/prospectuses/mutual-funds, accessed May 31, 2013.

23 The Automated Readability Index gives the grade level equivalent of the document: 16 is a college senior; 18 is someone who is two years into a graduate degree, such as an MBA; and 19 is a Ph.D. student. The longer a sentence is, the more difficult it is considered; the longer a word is, the more complex it is considered, Dale-Chall Unfamiliar Words are words that do not appear on a list of 3,000 common worlds that are known to most 4th-grade students. All documents were accessed between February 26 and 28, 2014.

24 George A. Miller. "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information"; Psychological Review, (1956). Available at: http://www.musanim.com/miller1956/. Accessed February 17, 2014.

25 *Id.*

26 For a simple explanation of this, see: Helen Tam, Christopher Jarrold, and Alan D. Baddeley, Domain-Specific Effects of Processing On Working Memory Performance. Available at: http://www.esrc.ac.uk/my-esrc/grants/RES-062-23-0148/outputs/Download/2124f645-eb6f-46b7-bfc6-8f6f4eb4bb05. Accessed February 17, 2014.

27 Why Does the Law of One Price Fail? An Experiment on Index Funds; Choi, Laibson, and Madrian; NBER, March 30, 2006. Available at http://www.nber.org/papers/w12261.pdf?new_window=1; Accessed February 10, 2014.

28 *Id.* at 4.

29 *Id.* at 4-5.

30 One full percentage point equals 100 basis points.

31 *Id.* at 6.

32 Morningstar, "The History of Exchange-Traded Funds (ETFs), February 12, 2012; Available at http://www.morningstar.co.uk/uk/news/69300/the-history-of-exchange-traded-funds-(etfs).aspx. Accessed April 16, 2014. This ETF was based on the 35 stocks in the Toronto Stock Exchange Index (TSE 35).

33 The Wall Street Journal, "A Focus on ETFs", available at http://online.wsj.com/ad/focusonetfs/history.html; Accessed April 16, 2014. The first domestic ETF was issued by State Street Global Advisors.

34 Visual Guide to ETFs; David J. Abner; Bloomberg Financial; Kindle Edition, 262.

35 *Id.* at 534.

36 FINRA Regulatory Notice 09-31, available at http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p118952.pdf, accessed June 3, 2013.

37 For more on this see "Leveraged and Inverse ETFs: Trojan Horses for Long-Term Investors", available at http://www.bant.am/wp-content/uploads/2013/01/Leveraged-and-Inverse-ETFs-Trojan-Horses-for-Long-Term-Investors-10-Point-Version.pdf.

38 Mis-Pricing of Structured Products Under New York Law, Phillipe Selendy, Capital Markets Law Journal, Vol. 5 No. 1; 34.

39 Standard & Poor's website available at https://ratings.standardandpoors.com/about/who-we-are/what-we-do.html; Accessed February 12, 2014.

40 Moody's website, available at https://www.moodys.com/Pages/atc.aspx; Accessed February 12, 2014.

41 Fitch Ratings website, available at https://www.fitchratings.com/web/en/dynamic/about-us/about-us.jsp; Accessed February 12, 2014.

42 BloombergBusinessweek, S&P's Outrageous, Clever Fraud Defense, April 23, 2013. Available at http://www.businessweek.com/articles/2013-04-23/s-and-ps-outrageous-clever-fraud-defense, Accessed on June 6, 2013.

43 See The CFA Program Candidate Body of Knowledge: The Past Decade, 2000-2010; Available at http://www.cfainstitute.org/programs/cfaprogram/Documents/cfa_program_curriculum_evolution.pdf; accessed March 5, 2014. Also see the Institute of Chartered Financial Analysts: A Twenty-Five Year History; available at http://www.cfapubs.org/doi/pdf/10.2469/op.v1987.n1; accessed March 5, 2014.

44 "Obama's Budget is a Populist Wish List and an Election Blueprint", Jackie Calmes, The New York Times; Available at http://www.nytimes.com/2014/03/05/us/politics/obama-submits-budget-to-congress.html; Accessed March 4, 2014.

45 "With Roberts, Yanks Hope Imperfect Piece is Good Fit", Tyler Kepner, The New York Times; Available at http://www.nytimes.com/2014/03/05/sports/baseball/with-brian-roberts-yankees-hope-imperfect-piece-is-good-fit.html; Accessed March 4, 2014.

46 "No Easy Way Out of Ukraine Crisis", Peter Baker, The New York Times; Available at http://www.nytimes.com/2014/03/05/world/europe/no-easy-way-out.html; Accessed March 4, 2014.

47 "Putin says he reserves right to protect Russians in Ukraine", Kathy Lally and Will Englund, The Washington Post; Available at http://www.washingtonpost.com/world/putin-reserves-the-right-to-use-force-in-ukraine/2014/03/04/92d4ca70-a389-11e3-a5fa-55f0c77bf39c_story.html; Accessed March 4, 2014.

48 *See* Supra Note 44.

49 "Obama announces budget at D.C.'s Powell Elementary", Emma Brown, The Washington Post; Available at http://www.washingtonpost.com/blogs/local/wp/2014/03/04/obama-announces-budget-at-d-c-s-powell-elementary/?wprss=rss_education; Accessed March 4, 2014.

50 "The Institute of Chartered Financial Analysts: A Twenty-Five Year History", Nancy Regan, The Institute of Chartered Financial Analysts, 1987; Available at http://www.cfapubs.org/doi/pdf/10.2469/op.v1987.n1; Accessed June 3, 2014.

51 "The CFA Program Candidate Body of Knowledge: The Past Decade, 2000-2010", Thomas R. Robinson and Christopher B. Wiese, CFA Institute; Available at http://www.cfainstitute.org/programs/cfaprogram/Documents/cfa_program_curriculum_evolution.pdf; Accessed June 3, 2014.

52 Author's private collection.

53 "Series 65 Exam Specifications and Outline", NASAA, Effective January 1, 2010; Available at http://www.nasaa.org/wp-content/uploads/2011/08/Series-65-Exam-Specification.pdf; Accessed June 3, 2014.

54 Author's private collection.

55 "General Securities Representative Qualification Examination (Series 7) Content Outline", FINRA, 2012; Available at http://www.finra.org/web/groups/industry/@ip/@comp/@regis/documents/industry/p124292.pdf; Accessed June 3, 2014.

56 Individual broker-dealers may have work and education requirements, but FINRA does not. Various web forums recommend three to five weeks of reading before taking the exam preparation courses. However, the Kaplan University Series 7 traditional live class is only four days, 9am to 5pm. Available at http://www.kfeducation.com/securities/series-7?state=ny; Accessed March 6, 2014.

57 Individual Registered Investment Advisory firms may have work and education requirements, but the states and the SEC do not. Various web forums recommend three to five weeks of reading before taking the exam preparation courses. However, the Kaplan University Series 65 traditional live class is only two days, 8:30am to 5:30pm. Available at http://www.kfeducation.com/securities/series-65?state=ny; Accessed March 6, 2014.

58 Individual insurance companies may have work and education requirements, but the states to not. Most states have a 20-hour life-only pre-licensing requirement. Kaplan University Life Only traditional live class, four days, 9am to 5pm. Available at http://www.kfeducation.com/insurance-lic/state/ny/?level=LH; Accessed March 6, 2014.

59 The American College; Available at http://www.theamericancollege.edu/the-college-experience/getting-started; Accessed March 6, 2014. Phone conversation with American College representative "C.J." at 8am on March 6, 2014.

60 Wake Forest University Online CFP Certification Program. Available at http://wfu.course-central.com; Accessed March 6, 2014.

61 CFA Institute. Available at http://www.cfainstitute.org/programs/cfaprogram/charterholder/Pages/index.aspx; Accessed March 6, 2014.

62 Wikipedia, s.v. surgeon's assistant. Available at: http://en.wikipedia.org/wiki/Surgeon's_assistant; Accessed April 16, 2014.

63 SEC Names New Specialized Unit Chiefs and Head of New Office of Market Intelligence. Available at http://www.sec.gov/news/press/2010/2010-5.htm; Accessed February 21, 2014.

64 *Id.*

65 Regulatory Notices were previously called Notices to Members.

66 FINRA Regulatory Notice 12-03 Complex Products. Available at http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p125397.pdf; Accessed February 24, 2014; 3.

67 *Id.* at 3-5.

68 *Id.* at 3.

69 *See* the Nobel Prize website, available at: http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1978/simon-facts.html; Accessed March 13, 2014.

70 *See* the Nobel Prize website, available at: http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2002/kahneman-facts.html; Accessed March 13, 2014.

71 S.V. Bounded Rationality, Wikipedia, available at http://en.wikipedia.org/wiki/Bounded_rationality; Accessed March 13, 2014.

72 *Id.*

73 Factbox: How Goldman's ABACUS deal worked; Reuters; April 16, 2010. Available at: http://www.reuters.com/article/2010/04/16/us-goldmansachs-abacus-factbox-idUSTRE63F5CZ20100416; Accessed March 13, 2014.

74 *See* Brandeis biography, available at http://www.brandeis.edu/legacyfund/bio.html; Accessed March 13, 2014.

75 Markus Brunnermeier and Martin Oehmke, Complexity in Financial Markets; September 10, 2009. Available at: http://scholar.princeton.edu/markus/files/complexity.pdf; Accessed March 13, 2014.

76 "Whatever Happened to the Customer's Man?", Dan Jamieson, October 1, 2003; OnWallStreet. Available at http://connection.ebscohost.com/c/articles/10966142/whatever-happened-customers-man; Accessed June 13, 2013.

77 I am not suggesting that every Registered Representative was a customer's man, nor that abuses did not exist before the mid-1970's. The term may have originated as a way for brokers with the clients-interest-first mindset to differentiate themselves from those without it. *See* Supra Note 76.

78 "Investor and Industry Perspectives on Investment Advisers and Broker-Dealers"; RAND Institute for Civil Justice, 2008; 87. Available at http://www.sec.gov/news/press/2008/2008-1_randiabdreport.pdf; Accessed June 13, 2013.

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