“*Constructive Skepticism*” Volume 3 – Notebook #I: *Model Risk in Retirement Planning*

Introduction

This Notebook, titled Volume 3 - Notebook #I: Model Risk, addresses the quantitative aspects of “*Constructive Skepticism*”, a curriculum of Workbooks, Handbooks, and Notebooks in three volumes focused on making good individual, business, and investment decisions. This curriculum for clients, distributors, and manufacturers of retirement planning products and services addresses what we can count on, and what we must doubt in order to protect trust, or to re-build trust in relationships, brands, and institutions in the age of the “*New Normal*”.

As you can see from the Notebook’s title, and the first paragraph, words with a specific “*Meaning*” anchored in the work of a referenced author show up in “*Italicized Quotes*” to alert the reader that these words have a specific “*Terms-of-Art*” definition in the Glossary (See Volume 2 – Handbook #I: Glossary List and “*Terms of Art*” Definitions). These italicized words lessen the potential for confusion that may come from reading through the text linearly with an implicit, and different understanding.

How & Why Did We Get There?

Having witnessed first as a child, then as an adult, the difficult retirements of two prior generations, retirement planning became a personal focus of attention. This experience with prior generations showed that retirement looked like a problem worth trying to solve over a lifetime of work. Not only would the results apply to this writer, but they would also apply to nearly all readers.

This lifetime of work showed that retirement planning starts as a decision problem based on hard-to-see clinical inputs about client preferences, and that retirement management continues as a measurement problem based on observable outcomes. First. launch the rocket, then make course corrections to reach the destination. Thus, creating a retirement plan starts in the domain of moral choice, addressing values, goals, and individual ambiguity before continuing in the domain of economics, addressing issues about asset types, income flows, and historical averages.

This perspective resulted in the creation, and the selling of several start-ups, as well as this formalization of the “*Tools, Checklists & Processes”* that support the curriculum for “*Constructive Skepticism*”. Looking back at prior ventures, this perspective also informed the earlier development of the household balance sheet, the calculation of a dollar measure for risk capacity, and the development of retirement planning recommendations based on risk management techniques allocations. Having reached retirement age, and lived for a few years in retirement has demonstrated the personal value of this perspective, and the solutions derived from it.

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A major source of individual ambiguity in retirement planning comes from recognizing the timing and impacts of the technological, and demographic dislocations that will drive the economic, and policy “*Responses, Threats & Opportunities*”. For this writer, this perception of actionable dislocations started with the Dot.com Boom, and the power of low cost and near-instantaneous access to information. This led to the creation Rational Investors, Inc. in 1996 to provide “*Mass Customized Investment Advice in 401(k) Plans, over the Internet*”.

The second perception of an actionable dislocation came from seeing Boomers retiring at the rate of 10,000 per day, thus transitioning the Financial Industry from an accumulation perspective to a decumulation perspective. This led to starting Retirement Engineering, Inc. in 2002 in order to create a product solution, the Guaranteed Retirement Income Security (“GRInS”). It also led to starting The Retirement Income Industry Association (“RIIA”) in 2005 in order to create a “*Process*” solution, the Retirement Management Analyst professional designation based on the household balance sheet analysis.

During the public peer review process on Substack that has driven the writing of these Workbooks, Handbooks, and Notebooks, a reader asked:

- When did you get your “Aha!” moment about retirement planning, and
- When did you see a crack in the egg of traditional financial planning?

The “Aha!” moment happened after the sale of Rational Investors, Inc. to S&P in 1999. The “*Perception*” of its importance and urgency built up through a series of meetings with estate planning lawyers, broker/dealer representatives, registered investment advisors, insurance agents, and at the time, new Internet providers such as Jim Clark’s MyCFO.com. After 20 years of sitting on the industry’s side of the table, sitting on the client side of the table provided a startling, and uncomfortable perspective. The portfolio-centric messaging did not address many of my critical client-centric questions and concerns.

The differences between the accumulation perspective of investment management, and the decumulation perspective of retirement planning felt important, urgent, and personal. Something critical and existential kept missing in these discussions. The first thought went to building retirement products, and this led to Retirement Engineering, Inc. and the GRInS. However, this product building, and distributing experience showed that the financial industry had many products on the shelf, and likely enough of them.

The personal experience of incomplete client meetings combined with the start-up experience of the industry’s rejection of GRInS as a product solution led logically to seeing “*Process*” as the missing component. Advisor meetings focused on Financial Capital, and did not address the other components of the household balance sheet that I used along with a cash flow statement for personal budgeting.

The rest became history as meetings, and discussions with distributors as well as investment and insurance manufacturers about the GRInS product showed the presence

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of budgets for the development of a retirement planning “*Process*” instead of the development of a new financial product. This led to founding of a new industry association, RIIA, that would work like “*Switzerland*” with members from all parts of the financial industry, and that would take the perspective of the “*View Across the Silos*” to discover, document & teach the new best practices for retirement planning in the decumulation phase of the client’s life-cycle.

The third perception of an actionable dislocation came from living through the COVID-lockdowns, and witnessing the resulting collapse of the People’s trust in experts & institutions. Many clients stopped responding well to "*Trust me*" messaging, and did so across many industries. The depth of this heart-felt collapse in trust may cause it to last for more than one generation. On the other hand, it will create new addressable market segments, if only from market fragmentation.

Thus, many individual customers, including retirement planning clients, will respond better to “*Show Me*”, and "*See for Yourself*" approaches. As a result of these observations and experiences, The Curve, Triangle & Rectangle Institute (“CTRI”) joined Substack in 2022 as a platform to socialize the “*Tools, Checklists & Processes*” of the “*See for Yourself*” curriculum for “*Constructive Skepticism*” with these new markets and audiences. This curriculum helps clients, distributors, and manufacturers work together in order to re-build trust in the age of the “*New Normal*”.

A quote from the book “*Old School*” written by ***Tobias Wolff***, and first published in 2004 illustrates the purpose of this perspective and continuing work: “*In former time Arch had supposed that his sense of being a distinctive and valuable man proceeded from his own qualities, and that they would sustain him in that confidence, wherever he happened to be. He’s never imagined that this surety was conferred on him by others, by their knowing and cherishing him. But so it was. Unrecognized he had become a ghost, even to himself.*” This quote reveals the importance of sharing what we know with others, and for the mutual benefit of all involved. “*Meaning*” comes from what we do with others, and for others, as well as what they do with us, and for us.

However, this effort also revealed the dangers and opportunities that arise when deriving “*Meaning*” from voluntary cooperation turns into deriving “*Meaning*” from mandated consensus. Trust comes from an individual “*Process*” that builds up a sense of control, and ownership. It does not come from an institutional “*Process*” of dominance over the individual. The collapse in trust comes from what people and institutions have done, and can do to one another when pressed for time and resources. In the rush of real-life, what must we check for ourselves, and what can we trust when consensus leads to the individual pain, costs and failures that come from “*Willful Ignorance, Error & Deceit*”? Experience shows that it pays to find ways to open our eyes to see beyond “*Meaning*” from consensus in fields like retirement planning where:

- Dangers compound over time,
- Opportunities take time to become fruitful, and

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- The time remaining to open our eyes and make corrections becomes shorter and shorter as we get older.

CTRI, a membership-based, not-for-profit R&D institute started in 2018 and this writer’s in-retirement project, develops solutions that validate, improve, and justify retirement planning best practices above and beyond what was developed in prior ventures. These solutions include the “*Constructive Skepticism*” curriculum.

The “*Constructive Skepticism*” curriculum examines what we can trust, and what we must doubt. It articulates the “*Ecological Rationality*” of resolving doubt with “*Tools, Checklists & Processes*” that include emotions, algorithmic heuristics, conceptual models, and quantitative models. This Reading Note on Model Risk in Retirement Planning shows what readers should think about, and what questions they should ask in order to “*See for Yourself*” the level of trust that they can place in the quantitative models that support their retirement.

Setting the Stage for Analyzing Quantitative Model Risk in Retirement Planning

Back in the early 2000s, the typical perspective of Modern Portfolio Theory (“MPT”) focused on the portfolio, and a single optimization period. It was not designed to focus on the client’s household balance sheet, and spending, saving, and investing decisions over the retirement horizon.

The application of this portfolio-centric perspective to retirement planning usually started with estimates of Capital Market Expectations to feed forecasting models that ranged from doing multiplications in Excel over the retirement horizon to developing equations for stochastic processes such as Monte Carlo Analysis.

These portfolio-centric retirement plans projected the present into the future using estimates of expected values, variances, and correlations between financial assets for comparison with minimum thresholds that stood for the client’s desired retirement income from financial capital. Typically, these portfolio-centric retirement plans provided the client with several options for asset allocation, and their matching probabilities of success to meet, or beat the thresholds. Thus, these retirement plans used a decision-criterion external to the model, and based on the client’s feeling about utility and risk.

In the 2010s, the level of demand for retirement plans that came from the market dislocation created by the wave of retiring Boomers at the rate of 10,000 per day overwhelmed the industry’s ability to provide clients with good outcomes from portfolio-centric solutions. This led to a search for answers to questions that included the following:

- Should portfolio allocation in retirement planning continue to come from the client’s feelings about the market volatility of their investments?

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- Should portfolio allocations in retirement planning only look at the part of the financial assets, and not at the whole of the client’s household balance sheet?

These questions, and the creation of RIIA in 2005 led to the development of the household balance sheet, risk capacity expressed in net present valued dollars, and the articulation of the risk management techniques allocations before setting the portfolio asset allocations as differentiating components of the RMA curriculum. These new best practices for retirement planning marked an important turn in the historical timeline of client-centric planning. Readers can find this timeline in “*Constructive Skepticism*” Volume 2 – Handbook #4: The Template for Reading Research Papers – 1.6 “*Context*” from the Paper’s “*Historical Lineage*” (Pages 12 & 13).

In 2017, IMCA acquired RIIA’s RMA, as well as the Retirement Management Journal (“RMJ”), and the Retirement Management Forum (“RMF”) conferences. This acquisition and continued developments since then established the holistic, and client-centric style of retirement planning in the mainstream of the financial industry. CTRI kept RIIA’s research I.P. and continued the exploration of retirement planning questions, and solutions by focusing on the reading of foundational research papers about Health, Wealth, and Statistics.

By the early 2020s, not much had changed with the portfolio-centric approaches to retirement planning, so much so that popular industry researchers observed recently that not much had changed in the last 20 years with Monte Carlo Analysis. This lack of change proved problematic in the context of the third actionable dislocation mentioned earlier, the COVID lockdowns, and the matching collapse of trust in experts and institutions. Fortunately for client-centric retirement planning, the transparency and intuitive understandability of the household balance sheet made it a structurally trust preserving, and trust building best practice.

Further, CTRI’s continued work on the foundational “*Axioms, Assumptions & Hypotheses*” of the ***Logic & Statistics Program*** that validates the “*Rational*” portfolio-centric approaches led to the development of a long list of “*Puzzles, Paradoxes & Anomalies*” in finance and economics. This list formed the core of CTRI’s presentation at the first conference on Ergodicity Economics (“EE2021”). This presentation triggered new questions, and new solutions for the improvement of quantitative approaches to retirement planning in the context of trust and individual clinical ambiguity. These questions included:

- Should quantitative models for retirement planning rely on “*Expected Values*” that represent the likely outcome of the ensemble, or should they rely on “*Time Average Growth Rates*” that represent the likely outcome of the individual?

- Should quantitative models for retirement planning allow the client to choose a utility function that may or may not match the “*Growth Dynamic*” of their

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investment assets, or should they use the inverse of the “*Growth Dynamic*” as an internally coherent transformation function?

- Should researchers use the “*1/N Heuristic*” as the “*Null Hypothesis*” for the Hypothesis Testing of Asset Allocation models?

These new questions and solutions improve the quantitative aspects of both the portfolio-centric and the client-centric styles of retirement planning, and this Reading Note focuses on the risks that client and advisor must examine before they place their trust in the results of such quantitative models.

What Comes Next?

This Reading Note, titled Volume 3 – Notebook #I: Model Risk in Retirement Planning, belongs to a larger set of material that includes the Workbooks collected in Volume 1, and the Handbooks collected in Volume 2. Published on Substack in 2022 and 2023 at the request of CTRI members, and in the form of a public peer-review process based on writing two-page sections each and every day, these Workbook and Handbook drafts will remain available on Substack until the eventual print publication of their final version on Amazon, and include:

Volume 1: A Book of Connections in Four Workbooks

- Workbook #I: Our Shared Humanity
- Workbook #II: Making Good Individual Decisions
- Workbook #III: Making Good Business Decisions
- Workbook #IV: Making Good Investment Decisions

Volume 2: A Book of Collections in Four Handbooks

- Handbook #I: Glossary List and “*Terms-of-Art*” Definitions
- Handbook #II: Authors Profiles
- Handbook #III: References
- Handbook #IV: The Template for Reading Research Papers

Publication on Amazon will begin in 2024 with the print version of Volume 2 – Handbook #IV: The Template for Reading Research Papers so that readers can start with the end-product in hand, and use this collection of “*Tools, Checklists & Processes*” to “*See for Yourself*”.

Volume 3, a book of illustrations of how to use “*Constructive Skepticism*” has no set limit for its number of Notebooks, The ideas developed in these notebooks, written in long-form with no set limits on the number of pages will also remain available on Substack for public peer-review until their eventual publication in print on Amazon.

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The ideas gathered in these three volumes rest on “*Axioms, Assumptions & Hypotheses*” described in the Workbooks from Volume 1, and further defined in the Handbooks from Volume 2. These “*Axioms, Assumptions & Hypotheses*” start with the following “*Observations*”:

- “*Brains*” exists to manage “*Motions*” through “*Predictions*” (See Author Profile about ***Rodolfo Llinas*** in Volume 2), and continue with
- “*The Map is not the Territory*” (See Author Profile about ***Alfred Korzybski*** in Volume 2).

This reading note - Volume 3: Notebook #I: Model Risk in Retirement Planning – uses the Template for Reading Research Papers to find the “*Statistical Meaning*” and the “*Practical Meaning*” of “*Observations*”, “*Perceptions*”, “*Predictions*”, and “*Motions*” that come from model risk. It does so by presenting one key researcher at a time, starting with a review of ***Mike Sutton***’s work about the myth of “*Iron & Spinach*” – our first analogy to describe the important types of model risk in memorable form.

Side Note:

During the public peer review process on Substack for this Introduction to Volume 3 – Notebook #I: Model Risks in Retirement Planning, readers also asked subjective questions that included:

- What motivated you to the point of building a new “path”,
- How did rejection of such new ideas motivate or discourage you, and
- How did it feel?

The subjective part of the story became a typical history of innovation diffusion, complete with the expected list of error, deceit, rejection, betrayal, and plagiarism as well as insight, clarity, support, loyalty, and originality. RIIA felt like a vibrant collective happening, a movement open to all, and benefiting from contributions from all corners of the financial industry. The sting of slings and arrows, scary as some were, felt small in the context of what we were building. We made demands of ourselves, they made demand of others, and tended to hit were we once stood, not where we had moved, as we kept moving forward.

RIIA applied an institutional accounting concept, the Balance Sheet, to individuals in order to provide an intuitive illustration of the loading of risks in the household balance sheet with a minimum number of required “*Axioms, Assumptions & Hypotheses*”. These include market prices, and discount rates. CTRI applied a concept from biology, the ecosystem, to businesses and individuals in order to provide provides an intuitive illustration of the relative size of the flows that create these risks. Both the HHBS and the Business Ecosystem Template (“BET”) changed the way we looked at retirement planning.

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The BET, shown below, maps the flows and developing risks that come from innovating, and the resistance to innovation. It uses a holistic perspective that combines the “*View Across the Silos*” with “*Terrain Theories*” where ecosystems harbor the means of their own destruction. You can only keep what you can defend, and attacks from “*Willful Ignorance, Error & Deceit*” can come any and all ecosystem participants surrounding the “*Productive Host*”. For details see “*Constructive Skepticism*” Volume 1 – Workbook #III: *Making Good Business Decisions*.

Table 1: CTRI’s Business Ecosystem Template (“BET”) Showing the Role of the “*Productive Host*” at the Confluence of Time and Energy Flows

Evolutionary Flows vs. Energy Flows	Past/Ancestral	Present/Current	Future/Evolving
Inputs from High Potential Energy Reservoirs	**Cooperators**	**Partners**	**Clients**
Primary Energy Converters	**Parents**	**Productive Host**	**Children**
Outputs to Residual Energy Converters	**Suppliers**	**Manipulators**	**Predators**

It was hard to look through the opacity of RIIA’s own business ecosystem given its scope and diversity. We made our fair share of mistakes, and we did see the expected cases of “*Word Magi*c” as well as “*Number Magi*c” through “*Misdirection*” and “*False Reconstructions*”. What surprised us was the low price for made-to-order research papers based on small samples. Small sample, low-powered research tends to fail replication, and this problem has grown so large that ***John Ioannidis***, one of the most cited scientists, wrote a paper in 2005, titled: “*Why Most Published Research Findings Are False*”.

Seeing the limits of the consensus track traveled by research papers based on the quantitative estimate of statistical doubt from small sample averages, we looked for opportunities to travel a different track of research, a track based on individual clinical ambiguity. This is the track where individuals shed the tyranny of averages, and retake the power to ask questions.

This is the track that we took in 2005 when RIIA developed new retirement planning tools such as the household balance sheet (“HHBS”) analysis. HHBS analysis made clinical individual ambiguity tractable for the advisor, and understandable by the client.

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Clients and advisors can use the HHBS to ask better questions, instead of being silenced by normative solutions. In addition, the HHBS created explicit spaces for review and inclusion of portfolio-centric, and insurance-centric solutions. HHBS-based, client-centric retirement planning complements portfolio-centric, and insurance-centric approaches. CTRI’s work continued RIIA’s research on this track of expressing clinical individual ambiguity by asking questions, and found that it was travelling it in good company.

Retaking the power to ask questions is the track that ***Ole Peters*** took in 2010 with ***Ergodicity Economics*** (“EE”) when he started to ask foundational questions about the meaning of growth and “*Utility*” in financial models. As explained by ***Alex Adamou*** in his introductory presentation for EE2021, the “*Expected Value*” of a random variable provides an a-temporal decision criterion. However, individuals make decisions over time. Thus, EE studies the temporal aspects of randomness by determining the ergodicity of stochastic processes built from a randomness generator driving a specific “*Growth Dynamic*”. EE brings foundational changes to the development of financial, and retirement planning models.

EE’s framing of financial decision problems in terms “*Time Average*” growth rates instead of “*Expected Values*” of rates of return provides quantitative explanations that bring closure to a large number of the “*Puzzles, Paradoxes & Anomalies*” in ***Financial Economics*** & ***Behavioral Economics*** theories based on the ***Logic & Statistics Program*** For instance, it solves problems related to discounting and utility as intrinsic properties of “*Growth Dynamics*” that do not require an appeal to “*As-if*” models or hidden forces external to the model. As another example, “*Path Dependency*” breaks ergodicity. This means that researchers cannot coherently apply “*Expected Values*” to individual temporal analysis without further investigating, finding, and applying a proper matching functional transformation. Thus, EE research on (i) The generalization of Utility Theory, (ii) Insurance as an ergodicity problem, and (iii) Absorbing barriers as a source of non-ergodicity provides new best practices for HHBS, and BET analysis.

Other fellow travelers on this track of individuals retaking the power to ask questions include ***Gerd Gigerenzer*** and the “*Fast & Frugal*” ***Heuristics Program***. His work will come up frequently in this Notebook, especially with the development of improved best practices related to Behavioral Finance.

Turning to the final question of “How did if feel?”: Well, it felt good. We were not looking to win normative arguments for academic fame. We were looking for practical ways to build successful retirements. This meant building an understandable body of knowledge, and formalizing it so that we could teach it to other people that would then use it with their clients. This included the RMA graduate that I hired ten years ago as my retirement advisor. It still feels good after all these years.

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