

# The False Dichotomies of Modern Investment Management

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*“Models fail because they fail to incorporate the inter-relationships that exist in the real world.”*  
- Myron Scholes

For decades, the financial industry has relied on Modern Portfolio Theory as the cornerstone of the investment management process. But the reality is that **MPT isn't delivering the returns or the security that investors need**. With the evolution of financial markets, technology, and individual demographics, it's time to reconsider MPT – and to transcend it.

This paper will demonstrate where MPT has fallen short of its promises and **what can be done** to build better performing, lower volatility portfolios for the investors who rely on us to help build their future financial security.

## Introduction

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The models we use to manage portfolios for individuals are almost universally grounded in Modern Portfolio Theory (MPT), the Nobel prizewinning framework created by Harry Markowitz in the early 1950s. MPT has been successful not just for its endurance but for its ready applicability to portfolios both large and small.

However, in its simplicity lies its weakness.

There are several assumptions built into MPT and its derivative investment models that are problematic, and as the financial world evolves those problems are becoming significant liabilities.

Among other things, MPT assumes that:

- **Risk at the asset class level is adequately measured by variance**, which can be managed at the portfolio level by assessing and minimizing correlation. MPT assumes that this risk is measurable and that correlations (both between individual asset classes and between an asset and the broader market) are relatively stable and predictable over time.
- **Market risk factors are exogenous and stable over time**. They aren't affected by the behavior of investors, the strategies they employ, or by financial system weaknesses like interdependence or contagion risk.

The result of these assumptions is a set of false dichotomies, or false choices, that we force onto ourselves as an industry and onto individuals as our clients. It makes us susceptible to worse performance over time while putting client assets in unnecessary peril.

## Key Takeaways

Correlations between asset classes shift constantly, sometimes rapidly. MPT can't keep up.

Like correlations, asset-level risk factors also shift over time. MPT doesn't account for such changes - and investors pay for the consequences.

Investors are aware of these problems but both active and passive strategies fail to solve them.

Our answer is to go beyond MPT. Rather than assuming the markets will follow MPT's assumptions, we use artificial intelligence to better see their realities. We use ETFs to minimize costs and enhance liquidity.

The result is the active management of risk around a portfolio of passive investments: something we like to call **active management**.

Investing isn't just about tomorrow. For everyday people it's also about today. MPT gives the hope of outsize long-run returns: our **active management** approach offers the reality of smoother returns and long-term gains.

**Risk versus reward, active versus passive, short term versus long term: these are the false dichotomies that were born under the assumptions of MPT, and they are harmful.** There is a better way to manage risk and deliver robust performance - one that skirts the key problems of MPT while harnessing the product innovations that came from it.

## The False Choice Between Risk and Reward

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Under MPT and its portfolio construction strategies, asset class level risk is measured through variance, which essentially describes the “range” of probable values a number can be expected to take.

In the investment world, higher variance – what we commonly think of as potential volatility – means a higher potential for both losses and gains. MPT assumes that variance is measurable, predictable, and follows a normal (or bell curve) distribution around an average.



*Despite our industry's strenuous disclaimers to the contrary, almost every money manager uses past average returns and variance to generate performance predictions.*

Thus the risk versus reward framework of MPT: the higher the potential variance of a price or rate of return, the higher the potential earnings.

MPT seeks to maximize the return for a given level of variance by “diversifying” a portfolio of securities across asset classes with a range of correlation relationships and expected returns.

**Unfortunately, idea of maximizing risk-adjusted returns for a given level of variance is more of a theoretical construct than a practical strategy.**

That's because of **MPT's reliance on historical performance**. In building MPT-based strategies, portfolio managers rely on the strongly simplifying assumption that the past is predictive of the future.

Correlations between asset classes shift constantly, and sometimes violently. MPT can't keep up. What happens?

- Herding: When someone has a good idea, others follows suit.
- Contagion: Markets are more interconnected than ever, so the effects of shocks and downturns can spread rapidly.

Despite our industry's strenuous disclaimers to the contrary, almost every money manager uses past average returns and variance to generate performance predictions. Even sophisticated modeling techniques grounded in MPT rely on the premise that things will continue to be the way they have always been (whether in terms of expected rate of return, variance, or correlation – or all three).

Whether it's correlation, risk factors, rates of return, or variance, **the obvious must be stated: the world changes**. Sometimes quickly – and dramatically.

### **Case in point: the shifting landscape of correlation**

Whether you're looking at correlations between individual asset classes and the broad market or between individual asset classes and each other, **the assumption of stability has repeatedly been shown to be false**. To borrow from our industry's famous disclaimer, past correlation is *not* a predictor of future correlation.

Part of the reason is herding behavior among investors: we tend to follow each other when someone has a good idea. As investors find relatively untapped asset classes and move into

them, they change the *properties* of those asset classes with respect to the rest of the market.

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### Correlations change – but human nature doesn't

*“They thought risk had been diversified when, in fact, it had been concentrated. Time and again, from the spring of 2007 on, policy makers and regulators were caught off guard as the contagion spread, responding on an ad hoc basis with specific programs to put fingers in the dike. **There was no comprehensive and strategic plan for containment, because they lacked a full understanding of the risks and interconnections in the financial markets.** Some regulators have conceded this error. We had allowed the system to race ahead of our ability to protect it.”*

*From the Financial Crisis Inquiry Commission  
“Financial Crisis Inquiry Report,” January 2011.*



**This has an impact on the price, performance, and volatility of individual asset classes, sectors, and even geographic regions.** For example, concerns about American monetary policy had a profound effect on emerging market bond valuations in 2013 and 2014. As worries flared, investment dollars were rerouted back to the developed world, and emerging market bonds cratered.

The fall wasn't due to any fundamental change in the economies in question: it was simply due to herding.<sup>1</sup> The actions of investors affected the investment.

This might sound somewhat obvious, especially when looking at individual situations in retrospect, but changes to correlations and the follow-on effects of those changes can go far beyond a single asset class.

Contagion can take a shift in the relationship between two asset classes or instruments and infect several markets, or even economies. The first major incident occurred when a nifty new tool called portfolio insurance resulted in the October Crash of 1987, when several global markets saw a spike in correlations, only to see them fall again after the crash.<sup>2,3</sup>

Portfolio insurance involved the use of derivatives to create new insurance product that asset managers could use to prevent loss. The models used to build it used a critical MPT-based assumption: that *stock and option prices wouldn't be affected by transactions in the portfolio insurance market.* Unfortunately, the customers of portfolio insurance (and the unsuspecting market participants around them) believed the same.

But when stock prices happened to start falling a little, and insurers began to liquidate securities to cover them, both the underlying models and the insurance market entered into a vicious spiral – and crashed.<sup>4</sup>

In other words, portfolio insurance was a victim of its own assumptions: by declining to account for the effect of the new product on the market context around it, the product's risks remained hidden – much like they do with MPT.

Today, with the speed of transactions faster than ever and market ties deeper than ever, *these types of risks are only growing more pronounced.* The financial crisis, for example, saw a significant

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spike in global market correlations<sup>5,6</sup> that MPT-based models simply did not and could not predict.

**What's missing from MPT is a recognition of the constant dialogue between global market risk and asset class level risks.** Our investment behavior influences the risks to specific investments and thus to the market. We ignore it at our own peril.

### ***The instability of asset classes***

**The risk factors within specific asset classes also change over time.** Simplistic ideas - bonds for stability, domestic equities for growth, international equities for risk - aren't a realistic way of looking at the world over the long run.

Take the bond market. *Most models do not appropriately account for low or negative interest rate risks - a convenient assumption, perhaps, but one which can cause significant problems.*

In a zero or negative rate environment, bonds could introduce more risk than the equities they are presumed to hedge. And at persistently low rates, investors face a world order - and new risks to their savings that MPT models don't acknowledge.

Interest rates pose one such risk. After a protracted period of low rates, US Treasury yields jumped half a percentage point in the weeks following the November 2016 presidential

election.<sup>7</sup> That surprising few weeks proved an important point: **not only do risks evolve with economic realities, they can defy expectations** - even for the "boring" bond market. Another example occurred in September 2008, hardly a good time for most investors as you might recall.

### **What do you do when bonds are no longer useful for risk hedging?**

Instead of sticking with something that's not working because it's what you're "supposed to do," consider what might work better given the specifics of your current environment.

One cheap and opportunistic risk hedge that often gets overlooked by both individuals and portfolio managers is cash (and its equivalents). Individuals don't think of cash as an investment, and asset managers often feel compelled to deploy it - sometimes into high-cost, low-performing options that promise to help manage risk. Does it have to be that way?

In a world where context matters (and we're arguing that it matters a lot), every tool should be on the table - not just the Old Faithfuls of yesterday.

In that single month the SIFMA municipal bond swap index yield jumped from 1.79% to 5.15%, later hitting 7.96%.<sup>8</sup> It took investors by surprise - especially unsuspecting pre-retirees, who were not anticipating their **conservative portfolios becoming quite so frighteningly volatile.**

**"Bonds for stability" is what the financial industry says to itself and to individual clients, but this is not an adage for the ages.** That doesn't just go for bonds, but for our persistently strong assumptions about all asset classes.

Investors are aware of these problems. What do they do?

- Active management becomes the victim of its own success through herding
- Passive management still gets impacted by price distortions and market shocks

As investors, we cannot assume that long-term averages for yields, correlations, credit quality, or the “typical” risks embedded into an asset class are reliable proxies for the future – especially not in turbulent times or in the face of sweeping change.

## The Distracting Debate About Active vs Passive Management

The problem of change in financial markets is not unknown, and its risks are typically addressed in one of two ways: *through increasingly complex attempts at diversification or through the conclusion that only passive strategies are worth the effort and cost.*

As the “smart money” sees rising correlations, there is something of an **arms race towards alternative asset classes** and new strategies that seek to reduce the effects of rising interdependence. From active managers with global smart-beta techniques to institutional investors moving in and out of ETFs, active management may have evolved in the past decades, but its core tenets remain alive and well.

Unfortunately, as in the case of portfolio insurance, it is often the case that **the effectiveness**

**of any given strategy is its own undoing.** Things might seem to be working until suddenly they stop – at which point everyone heads for the exits.

A Federal Reserve study on institutional bond investing found a tendency to sell off in lockstep during market downturns, a trend that is particularly prominent among mutual fund managers. This has a damaging effect on overall prices in the bond market that have nothing to do with underlying fundamentals (as demonstrated by emerging market bonds in 2013-2014, noted above).<sup>9</sup>

**Even those who attempt to bypass these issues by investing passively in index funds are affected.** Aside from price distortions during downturns, the popularity of index funds boosts the demand for the securities in those funds, which in turn impacts their prices.



*Investors are exposing themselves to unknown and unmanaged risks, and they're doing so by adopting assumptions about the market that are convenient, but false. **This is the real heart of the problem, and it's also the source of the solution.***

Investors are pursuing everything from smart-beta to passive index fund strategies based on a set of assumptions about how volatile those strategies will be, how they'll behave in the future, and what can be expected in the way of returns – *all without recognizing the fact that these key risks and features are changing all the time.*

**This is the real heart of the problem, and it's also the source of the solution.**

Our answer is to go beyond MPT. We call it **active management**.

## Beyond MPT: Active Risk Management

What the so-called active and passive approaches get wrong is that they're attempting to manage the problems of MPT by using MPT. The answer isn't to try solving the problems of the framework from within it: the answer is to go beyond it.

Our proposition is to **actively manage the ever-changing risks facing a portfolio** with a flexible worldview encompassing multiple analytical methods, a robust computational platform utilizing artificial intelligence, and the cost-effectiveness and liquidity of ETFs.

We propose a worldview that acknowledges the qualitative, quantitative, non-normal, and chaotic reality of the markets. We advocate for a risk management system that isn't hampered by a reliance on past performance or the assumption that risks, correlations, and asset characteristics don't change.

We call it **active management**.

### ***The modern scope of risk management***

Humans have an amazing ability to spot patterns and build narratives, but artificial intelligence has the upper hand in mining large amounts of raw data for surprising patterns, emerging trends, and more accurate predictions.

### **The Many Strengths of ETFs**

In this day and age, we have unprecedented access to a wealth of accessible, highly liquid investment products – our favorite is the ETF. Investors are spoiled for choice when it comes to ETFs; we enjoy near-limitless flexibility to build risk-managed portfolios through a wealth of specific products. Liquidity is another feature that offers a powerful buffer against risk. When markets fall, the ability to maneuver is paramount.

But there is another significant benefit: cost. ETF expense ratios are of course famously competitive, and liquidity reduces costs by minimizing spreads. Within a scalable and cost-effective portfolio management system, investors can get even more from these strengths.

With that capability and capacity, we can build and combine numerous frameworks for the financial and economic environment and test them in unison. That means we can gain visibility into the ways that multiple key metrics evolve over time.

Freed from simplistic assessments of how the world worked yesterday – for example, that the returns to a particular asset class should always follow a statistically normal distribution – this approach can see and quantify the world as it is today.

**With this engine, it is possible for us to implement a top-down risk management process that constantly checks allocation and investment decisions against the current risk environment.**

It starts with a process of absorbing broad market information and evaluating the data with a set of technical, fundamental, and relative value metrics weighted to reflect current reality. The result is an optimized asset allocation plan that reflects the here and now, rather than the past.

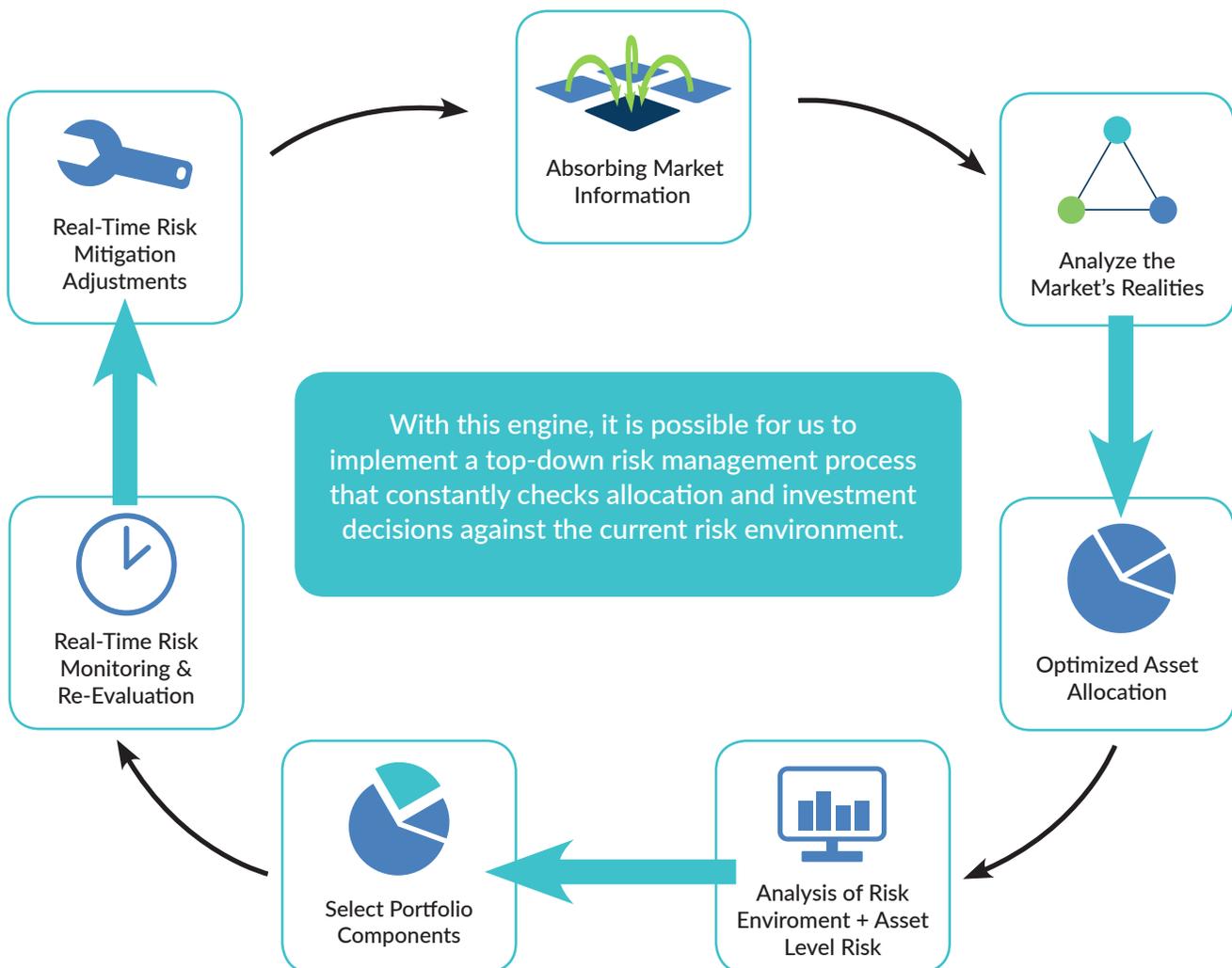
Investment decisions within asset classes - the specific exposures and ETF instruments used to build the portfolio - are next. An optimization process that accounts for the macro risk environment and asset level risk drives these selections.

If an allocation decision doesn't pass muster in either a macro-level or asset-specific risk area,

or if there is reason not to diversify the risk in the recommended fashion, it is re-evaluated and adjusted. This process reduces exposure to unnecessary risks - or to the shifting sands of the investment environment.

This process shouldn't occur once: it should be taking place **every day**. As many investors know, markets seem to move more rapidly than ever, and new risks always seem to come out of nowhere.

By **actively** monitoring and managing risk, portfolios can be spared the worst of market cycles and adapt before a potential problem becomes a full-blown crisis.



### Artificial intelligence allows you to:

- Monitor risk in real time and adapt to rapid changes in correlation, security prices, and market and/or economic risks
- Analyze large volumes of data to build nuanced models of risk that transcend simplifications like historical average returns and variance.
- Account for critical factors like non-normality of security price returns, qualitative asset features, and behavioral influences that go unaccounted for by MPT.
- Identify and exploit subtle patterns in the markets that are difficult for humans to catch.
- Minimize client cost with optimized/reduced transactions and greater economies of scale.

### **Beyond human behavior**

Whether you're known for being the "smart money" or an average retail investor, you're subject to the same human weaknesses and biases as everyone else. As we saw with mass herding into portfolio insurance in the 1980s, Long-Term Capital Management in the 1990s, and the widespread underestimation of sub-prime mortgage risk in the 2000s, no one in our industry has been spared this lesson.

But building a flexible and robust risk management system on the back of an intelligent computing platform can deliver one additional (and very important) benefit: freedom from the human irrationality that drives so much of investment behavior. With deep analysis across a range of viewpoints and metrics, our biases can fall by the wayside.

## Beyond Time Horizon and Into the Future

This method can also help you go beyond another stubborn vestige of MPT-based investing: the illusion of time horizon.

One of the standard tenets of asset management assumes a greater tolerance for variance when money is being saved up for the "long-term." Unfortunately, that tolerance doesn't always translate into real benefits when they're needed.

One study found that 80% of an individual's retirement outcome (i.e., how long their money lasts) could be attributed to what happens in the market in the first decade of retirement.<sup>10</sup>

**In other words, you can do everything right by MPT and still see everything go horribly wrong.**

Even under the most generous view of how effective MPT can be, the idea that someone should have to bear double-digit losses in pursuit of a possible multi-decade return fails to account for the fact that **the individuals holding these investments are people**. They get sick, they lose their jobs, and they have personal and family crises that necessitate financial reserves.

It's not sensible that a retiree should have to rely on hope that the market will perform decently in the coming decade. It's not reasonable to enforce a risk management strategy of "more

Investing isn't just about tomorrow. For everyday people it's also about today. **Pactive management** offers the reality of smoother returns and long-term gains.

bonds” when rates are low and it’s far from clear that bonds will be effective as a hedge.



*The idea that someone should have to bear double-digit losses in pursuit of a multi-decade return fails to account for the fact that the individuals holding these investments are people.*

Rather than hope the world will never change and pretend that people aren’t concerned about what’s happening with their money in the moment, **we can do better by managing risk in the moment to help prevent excessive losses and provide smoother, stronger returns.**

## **A new era for advisors**

Our answer to MPT is to go beyond the false dichotomies it has ingrained in the asset management industry and to reach for a better solution. By combining a flexible and holistic analytical framework with modern computing and low-cost ETFs, we can understand the world in a way that was never possible before – and act on that understanding by building and managing better portfolios.

The time of MPT as the answer to our investing questions has passed.

Now is the time for **pactive management.**

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<sup>1</sup> International Monetary Fund (2014, April), *Global Financial Stability Report—Moving from Liquidity- to Growth-Driven Markets*. Retrieved From: [www.imf.org/External/Pubs/FT/GFSR/2014/01/pdf/text.pdf](http://www.imf.org/External/Pubs/FT/GFSR/2014/01/pdf/text.pdf)

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<sup>9</sup> Cai, F, Song, H, Dan L, & Yi, L (2016). Institutional Herding and Its PriceImpact: Evidence from the Corporate Bond Market, *Finance and Economics Discussion Series 2016-091*, Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2016.091>.

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