MYTH: Time reduces risk

A research report authored by
Ineichen Research & Management

EXECUTIVE SUMMARY

> Alternative investments are still not fully destigmatized by many investors, despite the fact that their inclusion in balanced portfolios has proven their merit at least twice during the previous decade. The purpose of this Series of reports is to demystify some of the misconceptions still surrounding alternative investments.

> Some academic finance literature suggests that time diversifies risk, meaning that investing for the long term reduces risk. Disciples of buy-and-hold strategies also believe in the idea of time diversification. The logic is that if one has a very long investment horizon, one can recover from large losses. The counter argument is that time actually amplifies risk. The logic here is that over the longer term, more bad things can happen and the probability of failure and destruction is higher.

> As this decade has progressed and the current credit crisis has continued to unfold, it is becoming apparent that the science we refer to as finance, and which is built on Modern Portfolio Theory, has its shortcomings. Volatility is not a good proxy for risk. Accidents happen. Things can go wrong and volatility has very little to do with it.

> We think time diversification is a myth. Time amplifies risk. It is true that the annual average rate of return has a smaller standard deviation over a longer time horizon. However, it is also true that the uncertainty compounds over a greater number of years. Unfortunately, the latter effect dominates in the sense that total return becomes more uncertain the longer the investment horizon. Furthermore, betting on the long term might not be applicable for most investors. After all, the long term is nothing else than many short-term periods joined together.

> Uncertainty begets risk. Risk, however, can be actively managed.

"A smart girl leaves before she is left."
—Marilyn Monroe

Time diversification

The time diversification controversy depends on how we define risk

Over the past 20 years or so there has been a debate—sometimes referred to as the "time diversification controversy"—as to whether time reduces or "diversifies" risk, or whether risk is amplified when the investment horizon is lengthened. There are essentially two camps. One school of thought is that time reduces risk; the other argues that time increases risk. Conventional wisdom suggests that over long horizons, above-average returns tend to offset below-average returns. In addition, volatility decreases with time and the probability of (end-of-period) loss also falls with time. However, if the magnitude of potential loss defines risk, then risk increases with time. The probability, for example, of San Francisco being wiped out by a large earthquake over the next 200 years is much larger than over the next 200 days. The bottom line is, as Mark Kritzman, a senior lecturer and investor and an authority on the subject, put it in 2000:

> *"The truth is that risk has no universal definition; rather like beauty, it is in the eyes of the beholder."*

"The long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in the tempestuous seasons they only tell us that when the storm is past the ocean will be flat."
—John Maynard Keynes (1883-1946), British economist

We believe the consensus on the topic is the former, i.e., the idea that time indeed diversifies risk. The premise of investing in a long-only buy-and-hold fashion is that short-term volatility is ironed out over the long run. This is true if risk is defined as volatility (annualized standard deviation of returns). If one has an investment horizon of 25 years or longer, one has the time "to sit it out" and recover from large dislocations in the market. In addition, equities have a higher probability of outperforming government bonds over 25 years than over one year. Many institutional investors have the financial stability and liquidity to handle a downturn in the market, even with a large allocation to long-only equities. For these plans, any amount not invested in equities may simply reduce the long-term growth of assets with no offsetting benefit.

"Forever is composed of nows."
—Emily Dickinson (1830-1886), American poet

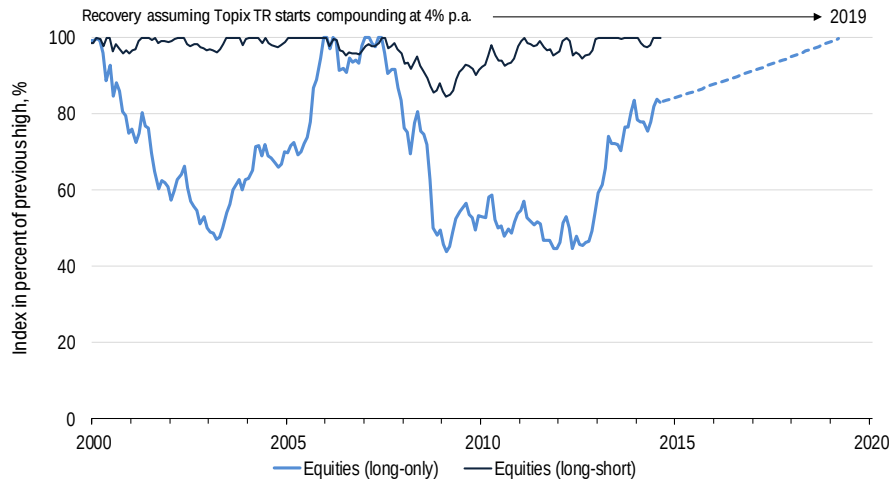
We think time diversification is a myth. Time amplifies risk. It is true that the annual average rate of return has a smaller standard deviation for a longer time horizon. However, it is also true that the uncertainty compounds over a greater number of years. Unfortunately, this effect dominates in the sense that the total return becomes more uncertain the longer the investment horizon. After all, the *long term* is nothing more than many *short-term* periods joined together.

As this decade has progressed and the current credit crisis has continued to unfold (overall debt-to-GDP ratios have risen since the financial crisis, not fallen), it is becoming apparent that the science we refer to as finance, and which is built on Modern Portfolio Theory, has its shortcomings. Volatility is not a good proxy for risk. As the British economist Lord Bauer put it: "A safe investment is an investment whose dangers are not at that moment apparent." Accidents happen. Things can go wrong and volatility has very little to do with it. Uncertainty begets risk. Risk, however, can be actively managed.

"The reason lightning doesn't strike twice in the same place is that the same place isn't there the second time."
—Willie Tyler, American ventriloquist, comedian, and actor

In the following section, we discuss the long-term performance of Japanese equities to demonstrate that blindly relying on the long term might not be pragmatic, despite the time diversification debate. We do not believe that there is a sound argument that recent Japanese economic history is entirely irrelevant for U.S. investors. After all, Japan does not have a monopoly when it comes to economic failure and policy error.

Figure 1: Japanese equities (January 2000 – August 2014): long-only versus long-short



Source: IR&M, Bloomberg. **Past performance is no guarantee of future results.**
Note: Based on Topix TR Index and Eurekahedge Japan Long Short Equities Hedge Fund Index

Figure 1 is a drawdown chart (showing losses as a percentage of the previous all-time high) which uses a Japanese equity index (Topix Total Return Index) as a proxy for a long-only strategy in Japan and an equities long-short index (Eurekahedge Japan Long Short Equities Hedge Fund Index) comprised of hedge funds investing in Japanese equities in a long-short fashion. The dotted line assumes the Topix Index starts compounding at 4% per year from September 2014 onwards. In such a scenario, the Index would reach its previous high from 2008 around the year 2019. (If the Index starts compounding at 4%, and assuming dividends are re-invested and not taxed and spent, the all-time Index high from December 1989 would be reached around the year 2027.)

Compounding capital negatively over many decades is a possibility

Equities are expected to rise in the long run; time is supposed to diversify/reduce risk. However, from January 1990 to August 2014, the Topix Index compounded at an annual rate of -0.5%. (We have chosen Japan to demonstrate that equity markets can fall materially and not recover, even in modern times.) The trajectory in Figure 1 shows the Index assuming compounding continues at a rate of 4% per year. In theory, mean reversion is one of the most powerful concepts in finance as *dead cats nearly always bounce*. However, it doesn't always seem to work. Or it might take too long to be a practical concept on which to bet. There is uncertainty regarding the reversion to the mean. Sometimes the cat dies and that's just the end of the story.

"Reversion to the mean is the iron rule of the financial markets."
—John C. Bogle, Founder of The Vanguard Group

Empirical research suggests that equities go up in the long term, and in the long term, equities outperform bonds. This is true, especially when ignoring hyperinflation and gaps in the data. However, the practical issue with the long term, as British economist John Maynard Keynes so famously put it, is that you might not live long enough to experience the long term. The empirical research might be true, but it is of little practical relevance for most investors. To illustrate this point, Figure 2 shows a selection of historical equity market peaks (each set to 100), two years prior to peak, and 20 years after the peak.

"A long-term investment is a short-term investment that has failed."
—Saying

Figure 2: Equity market bubbles and time to recover losses

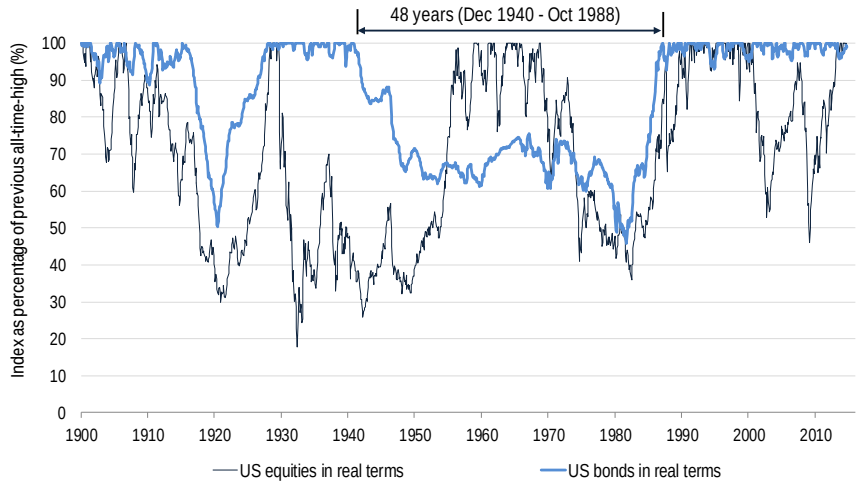
Source: IR&M, Bloomberg. **Past performance is no guarantee of future results.**

The S&P 500® Index reached a peak in 2007 and recovered swiftly. This is the exception to the rule. It was only possible with unprecedented intervention from government authorities. The other extremes are the S&P 500 after its 1929 peak and the Nikkei 225 after its 1989 peak: 20 years after their peaks, the indexes still were underwater by 52% and 73%, respectively. The Nasdaq Composite, at the time of writing, had not yet recovered its peak from 14 years ago.

"A random market movement causing the average investor to mistake himself for a financial genius."
—Alternative definition of an equity bull market

What is true for equities is true for bonds too. Figure 3 shows another drawdown chart, in this case U.S. equities and bonds in real terms (adjusted for inflation), since 1990.

Figure 3: Underwater perspective of U.S. equities and bonds (January 1900 – August 2014)



Source: IR&M, Bloomberg. **Past performance is no guarantee of future results.**

While equities can spend a long time "underwater," bonds can compound at a negative rate for a long time too. U.S. bonds started to produce losses around December 1940 and had not recovered, in real terms, until October 1988, roughly 48 years later. So much for time diversifying risk.

The time diversification controversy is not the only debate with regard to losses and risk management that has been revisited in the post-2008 financial crisis era. The financial crisis has shown that not everything that matters can be measured. The idea that time diversifies risk rests on the assumption that risk can be measured—it cannot, or at least not perfectly. As practitioners, it makes sense to distinguish between risk and uncertainty.

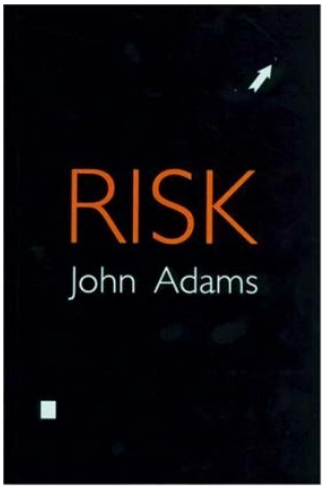
"Not everything that can be counted counts, and not everything that counts can be counted."
—Albert Einstein (1879-1955), Physicist

Confusing risk measurement and risk management

Many investors have been beefing up their risk management capabilities since the last financial crisis, partly due to increased regulation and partly because of an after-the-accident learning experience. It has become apparent that some of the beliefs and assumptions, which were formed during the historic equity bull market that ended in 2000, are false, misleading, dangerous, or not applicable. Risk management (as opposed to risk measurement) deals with changing one's portfolio in response to an ever-changing environment or changing rules that happened to have worked fine in the past. The future is uncertain. The only thing we really know for sure is that the status quo is going to change. Risk management, we believe, is the thought process that balances investment opportunities with the probability of capital depreciation.

"Doubt is not a pleasant state of mind, but certainty is absurd."
—Voltaire (1694-1778), French writer

The front cover of *Risk* by John Adams (the U.K. geographer, not the U.S. president) depicts a black area, with a small square in the lower left and an even smaller square in the upper right. Adams refers to a 1983 report from the National Research Council in the U.S. which noted that about five million different chemical substances are known to exist and that their safety is theoretically under regulatory jurisdiction. Of these, about 7,000 have been tested for causing cancer (larger white square in the lower left), while fewer than 30 have been definitively linked to cancer in humans (small white square in the upper right identified by the white arrow). The proportion of each white square and dot to the black space is the same as the proportion of 7,000 tested substances and 30 discovered carcinogenic substances to the five million chemical substances. Adams calls the dark space "darkness of ignorance." We just do not know the carcinogenic effects of most substances. Our knowledge is limited. The same is true in finance. We don't know much about the future. There is an extreme asymmetry between the little we do know and what we don't. There is uncertainty. If you think about it this way, equating risk with volatility of traded securities becomes a rather silly endeavor. This suggests that the theory on which the idea of time diversification rests is either false or not applicable for most investors.



One important aspect of risk management is the term "unknown unknowns." In finance, we tend to distinguish between "risk" and "uncertainty," also known as Knightian Uncertainty, named after American economist Frank Knight (1885-1972). When discussing matters related to risk, we assume we know the distribution from which destiny will pick future events (quite often a normal distribution is assumed). This is the reason why financial textbooks always discuss coin flipping games or examples with dice or roulette tables. In these instances, the probabilities can be calculated exactly. Uncertainty is not the same as risk though. It is a term used in subtly different ways in a number of fields, including philosophy, statistics, economics, finance, insurance, psychology, engineering, and science. It applies to predictions of future events, to physical measurements already made, or to the unknown.

"There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. There are things we do not know we don't know."
—Donald Rumsfeld in 2002, former U.S. Secretary of Defense (2001-2006)

Concluding remarks

It goes without saying that, for practical purposes, it is uncertainty that matters, not risk. We can apply rigorous quantitative analysis to matters related to risk, but not to uncertainty. Many practitioners have moved away from normal distributions and pretentious mathematical precision, strongly influenced by Nassim Taleb's work and the "learning by doing" experience that was the financial crisis. To deal with uncertainty requires thought and, most likely, common sense. Frank Knight argued that profits should be defined as the reward for bearing uncertainty.

"One of the greatest pieces of economic wisdom is to know what you do not know."
—John Kenneth Galbraith (1908-2006), Canadian-American economist

The diversification idea—to many the only free lunch in finance—is based on the premise that we don't know the future. If we knew that wind farms would yield the best 10-year point return, there would be no need to care about risk or time diversification. Diversification is for those who know what they don't know. All other investors either don't know what they don't know or bought into a potentially false doctrine from which the only cure is substantial losses. "Learning by doing" is an important adage in risk management and experience a cruel and expensive teacher.

"Time is the best teacher, but unfortunately, it kills all of its students."
—Robin Williams (1951-2014), American actor and comedian

Ineichen Research and Management AG ("IR&M") is a research firm focusing on investment themes related to absolute returns and risk management.

The firm was founded in October, 2009 by Alexander Ineichen. Mr. Ineichen started his financial career in derivatives brokerage and origination of risk management products at Swiss Bank Corporation in 1988. From 1991 to 2005, he had various research functions within UBS Investment Bank in Zurich and London relating to equity derivatives, indices, capital flows, and alternative investments, since 2002 in the role of a Managing Director. From 2005 to 2008 he was a Senior Investment Officer with Alternative Investment Solutions, a fund of hedge funds within UBS Global Asset Management. In 2009 he was Head of Industry Research for the hedge fund platform at UBS Global Asset Management.

Mr. Ineichen is the author of two publications *"In Search of Alpha – Investing in Hedge Funds"* (October 2000) and *"The Search for Alpha Continues – Do Fund of Hedge Funds Add Value?"* (September 2001). These two documents were the most often printed research publications in the documented history of UBS. He is also author of *"Absolute Returns – The Risk and Opportunities of Hedge Fund Investing"* (Wiley Finance, October 2002) and *"Asymmetric Returns – The Future of Active Asset Management"* (Wiley Finance, November 2006). He has also written several research pieces pertaining to equity derivatives and hedge funds and contributed to several chapters to financial books. He also wrote *"AIMA's Roadmap to Hedge Funds"* (November 2008) which was, at that time, the most often downloaded document from their website.

Mr. Ineichen holds a Bachelor of Science in Business Administration with Major in General Management from the Universities of Applied Sciences in Business Administration in Zurich (HWZ), Switzerland. He holds the Chartered Financial Analyst (CFA) and Chartered Alternative Investment Analyst (CAIA) designations and is a certified Financial Risk Manager (FRM). He is on the Board of Directors of the CAIA Association and is a member of the AIMA Research Committee.

Alexander Ineichen CFA, CAIA, FRM
+41 41 511 2497
ai@ineichen-rm.com
www.ineichen-rm.com