Algos and Egos – Rediscovering portfolio insurance

Robert Hillman, 13 November 2016

This is the first in a series of notes on a rapidly developing theme in financial markets and investing – namely the collision of algos and egos. I will cover issues like the revival of portfolio insurance, the replacement of star-traders by automated trading strategies, the disillusionment of institutional investors with active managers, and the hopes pinned on machine learning and technology.

In the mid-1980s equity portfolio managers looked to recently developed portfolio insurance products to mitigate the losses they faced in a downturn. In 2016 institutional investors are shifting capital away from discretionary hedge funds toward largely automated pro-cyclical strategies like trend following for much the same reasons[1]. In this series of notes I will argue that these allocation changes are symptomatic of a deeper and possibly structural shift in attitudes towards investing.

In this first note I use the example of this switch towards trend following to make the point that in order to begin understanding this behavioural shift it is important to recognise that many apparently different approaches to investing share a lot more common ground than is widely appreciated.

Technology can tame the market!

The marketing claim in the 1980s was that investors no longer had to be at the mercy of whatever the market threw at them. Both institutional and retail investors were told they could conquer risk via the use of dynamic hedging techniques, central to the Black-Scholes-Merton model of option pricing that had been developed a decade earlier. The suppliers of these products presented themselves as having developed nothing less than a brand new technology heralding a new modern era of money management. After October 1987 some argued the mere presence of these products brought about the crash itself[2].

A narrative that I like was suggested by Fischer Black shortly after the crash[3]. The story goes that in the months leading up to the crash newly 'insured' investors bought more stocks believing they could take more risk. Other investors witnessed this increased demand for stocks but mistook it as a signal that informed investors knew something they didn't. Investors as a whole overlooked or could not measure the possibility that their combined actions might increase the likelihood of a crash[4]. When prices did start dropping, the information about who had been buying and for what reasons was suddenly revealed – and the market had to revert back to a much lower level.

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[1] See for example Pensions and Investments (18 April 2016), the Pensions Consulting Alliance website http://www.pensionconsulting.com/ (see refs), and for a concrete example the San Joaquin County Retirement Association, Board of Retirement Agenda, January 22 2016.

[2] To get both sides of the story in two books you can't do better than reading the collection of articles extolling the virtues of portfolio insurance in 'Portfolio Insurance, A Guide to Dynamic Hedging' edited by Donald Luskin, followed by the counter-attack (and boy is it an attack) by Bruce Jacobs "Capital Ideas and Market Realities".

[3] The primary source is Black 1988, but also Perry Mehrling's superb account of Black's contributions gives great context. It should be noted that at Goldman Sachs, Black was involved in trying to help Goldman belatedly break into the portfolio insurance market, which will have influenced his thinking. I only came across this book a couple of years ago thanks to Bernd Scherer – it's awesome. Sandy Grossman also offered a related observation about the information revealed by investor interest in portfolio insurance. Unlike actual option markets in which demand and supply for protection is reflected in the price of options, and in volumes where they are visible (i.e. for exchange traded options as opposed to less visible over-the-counter options), portfolio insurance, similar to trend following today, has no transparent price that indicates how important it might be revealed to be should the market regime change. I discussed this in a bit more detail in Hillman (2015).

[4] The story here is a little like the debates around things like introducing helmets for cyclists or body armour for rugby players. While the use of these products can help make an individual feel more protected, if everyone is using them and behaving more aggressively as a result, the final outcome could be an unintended increase in both the frequency and intensity of accidents.

During this adjustment process the providers of portfolio insurance had to sell stocks into a falling market adding to the selling pressure and creating a vicious self-perpetuating dynamic. Portfolio insurers were thus easily cast as aiding and abetting the process, if not as the outright villains of the piece, and over the next few years this form of product all but disappeared from the market.

If it looks like a duck…

But today in 2016 the behaviour that portfolio insurers exhibited is still very much present although you wouldn't know it by talking to its employers or reading their marketing materials. Modern day portfolio insurance is carried out by trend follower funds, many of who are also described as CTAs, short for commodity-trading-advisors. Portfolio insurers sold equity index futures as markets fell to offset losses in the equity portfolios they were mandated to protect. Likewise, when equity markets fall today trend-followers also sell. The precise amounts that either strategy trades in response to the ups and down will vary according to many factors, but the positive feedback from price changes to trades is shared. The key point is that embedded within today's trend follower strategies is an algorithm that at times will behave to all intents and purposes identically to the portfolio insurance strategies of the 1980s[5].

How to stress out your compliance officer

So why is it we rarely, if ever, hear today's trend followers explaining what they do with reference to portfolio insurance, or the more generic concept of option replication? The most obvious reason is that any association with the 1987 crash would be a marketing disaster. And today's managers are much more constrained by regulations than they were in the 1980s, partly precisely because of the 1987 episode. These days it is risky, if not illegal, to make any specific assertions beyond a general aspiration (definitely no promises!) to produce 'attractive risk-adjusted returns'.

In denial

Another reason trend followers do not talk about portfolio insurance is that they think they are doing something different. It is certainly true that they trade more than just equities and that they attempt to make money when markets rise as well as fall. And many of them also run other strategies alongside trend, and describe themselves as multi-strategy or systematic macro. But at the end of the day it is hard to dispute that in the circumstances in which portfolio insurers would be active, trend followers would be behaving similarly. To put it another way, if all you could observe was price action and the trading order flow from a manager during an equity market downturn, you would be hard-pressed to tell if they were following a portfolio insurance programme or a trend following programme.

Physicist snobs

A final reason why trend followers don't talk about portfolio insurance is because they might not know much about it. Many of today's systematic fund managers and researchers come from a physics, engineering or maths and stats background. Knowledge of finance is often openly eschewed, especially the branch that developed the dreaded financial engineering and what some refer to as the mumbo-jumbo of Black-Scholes. Many of today's systematic managers present themselves as data-scientists engaged in a valiant quest to discover hidden patterns and anomalies that those dumb finance guys - hung up on their efficient-markets-hypothesis - would tell you can't be there. Sadly, although this viewpoint was reasonably fair thirty years ago, today it reflects both a misunderstanding if not a misrepresentation of the last few decades of economic science. Whenever I hear physicist-traders waxing lyrical about their theory-free data-driven research discoveries I just can't help but think

[5] The most common trend follower techniques based on moving average crossovers can be trivially linked to Black-Scholes dynamic replication equations. The key differences between yesterday's portfolio insurers and today's trend followers is that portfolio insurers focused on equity markets and only tried to protect against equity down markets. Today's trend followers apply similar techniques across many different markets at once (often independently) and they also try to make money in up as well as down markets. One way to think about it is that portfolio insurers tried to synthetically create put type payoffs, trend followers try and create straddle type payoffs, i.e. mimicking both a put and a call.

of Keynes' much used quote that "Practical men who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist".

Economist and econometrician snobs

But economists and finance guys aren't blameless themselves. They too regularly fail to see links between what they do and what other 'less sophisticated' traders are trying to achieve. Perhaps the strongest example of this is provided by Fischer Black himself. He reportedly went around the Goldman trading floor confiscating books on technical trading, so strong was his belief that you should not be able to make money trading on patterns (Mehrling, 2012 p.243). But maybe he missed something. Maybe he missed that the trading rules that technical analysts follow can often be practically as near as damn-it equivalent to dynamic hedging. And what is more I would argue that many of the practical techniques and tricks-of-the-trade (mumbo jumbo to the academic finance guy) that some practitioners have developed heuristically over the years, might in fact be extremely sensible ways to robustify the process of dynamic hedging to some of its known (of which there are many) weaknesses.

It is not just the theoretically inclined economists like Black who could be accused of missing the value of technical analysis. As I discussed in an earlier article (Hillman, May 2015), econometricians and statisticians have long been frustrated and frankly baffled by the resilience of seemingly ill-founded heuristic forecasting techniques. They too should spend more time wondering why certain techniques like exponentially weighted moving averages are so hard to beat after more than 60 years, instead of publishing horse-races that demonstrate their model-of-choice is (spuriously) superior.

So the question begging is, so what? So what if trend followers effectively mimic what portfolio insurers did? Who cares? Not surprisingly I wouldn't have got this far unless I thought there was some merit in developing this revisionist view of trend following.

Discovering without understanding is dodgy

Firstly, without an understanding of the older finance literature today's researchers are likely to end up repeatedly reinventing the wheel, falling into known traps, and worst of all not really understanding the risk they are running and how it fits with other strategies. The latest examples of this I see come from those applying machine learning to historical price data and 'discovering' that in certain conditions strategies like buying-the-dip are profitable. This type of trading rule will probably be classified as belonging to a pattern-recognition style of trading, but it may well be practically equivalent to a synthetic short-put strategy, the flip-side of the long-put profile that portfolio insurance provided. It is hard to determine the true risks of these machine-learnt strategies from historical data analysis alone. But if they can be thought of as similar to dynamic hedging strategies then there are established methodologies that can help reveal the potential risks in all their gory details. Machine learning guys should talk to option traders and risk managers.

Befriend an option trader

Option traders have a feel for these elusive risks as they need to anticipate when hedging strategies break down due to gapping, transaction costs, and rapidly changing volatility[6]. The exact same problems befall price driven strategies like trend following. In my experience the value of a trading "signal" (the kind of object that machine learning techniques will tend to focus on discovering) is often secondary in importance to the method of converting the signal into a trade, and the ongoing risk-management of the position. In this view trend following and other systematic approaches are much more about dynamically risk-managing and tilting exposures than about supplying a directional predictive edge[7]. I have to confess though that option traders might not be overly

[6] A nice comprehensive and readable introduction to these practical nuisances is given by Euan Sinclair in Volatility Trading (2013).

[7] Trend following, portfolio insurance, and simpler trader folklore techniques like stop-losses are all ways of transforming negatively skewed market distributions into positively skewed ones. They do so by creating positive convexity, a subject we will return to.

welcoming. I'm afraid to say that in my experience many of them have low tolerance for 'black-box guys'. Both sides would benefit from working harder to understand each other.

Investors want plain vanilla

Secondly, and perhaps more urgently, it is worth comparing and contrasting the build up to October 1987 with recent market trends. In 2016 many investors are looking again at trend followers precisely for their portfolio insurance like capabilities. In the last year several large US institutional investors have put mandates out for trend followers as part of their risk-mitigation attempts (footnote 1). The most direct way in which a trend follower will offset losses in the event of an equity downturn is by getting short equities and selling into falling markets – the exact same fundamentally destabilising dynamic that portfolio insurers were tainted with[8]. Today's institutional investors get this, as is revealed by their preference towards pure or core-trend strategies, reflecting the fact that many of the non-trend strategies that systematic funds have added in recent years (e.g. those rebranded as systematic macro) are unlikely to prove helpful in the event of an equity market downturn[9]. Investors are also attracted to these simpler strategies as they are optically cheaper (lower fees) than flagship funds.

Are investors unwittingly harming themselves?

So what is one to make of these increasing allocations from US institutional investors towards simpler trend following strategies? A superficial conclusion might be that it increases the chance of a destabilising positive-feedback sell-off, fitting with the common perception of what happened in October 1987. Maybe it does, but at the same time we know that history is more likely to rhyme than repeat. And as I will explain in a future article there are reasons for believing that today's trends followers may in fact be a source of stability at times.

But if I was on a public fund investment committee charged with signing off on a risk-mitigation programme I would at the very least want to understand the wider implications of my (and others like myself) decisions. Not for altruistic concerns about the wider economy (though of course these would be eminently justified), but simply for self-interest.

If the key lesson from 1987 is less about the destabilising mechanical selling that portfolio insurers engaged in, and more about the way in which different groups of investors interpret the flows and behaviour of other investors, then Fischer Black's narrative remains relevant. Investment committees should work hard to understand the links between trend following, tail-protection strategies, option traders and their own rebalancing and investment allocation process. I don't see much evidence of this.

This pull towards trend following and other automated strategies is only one half of today's shift in investor behaviour. At the same time there is a major deallocation away from actively managed hedge funds. Behind these redemptions is a sense of total disillusionment with star-traders and hedge funds who many now perceive as greedy asset-gatherers. In the next part of this series I will explore the industry and market dynamics that led us to this state, exactly how star-traders made money in previous years and why they have been struggling of late.

To pre-empt my conclusion, I predict a blanket deallocation from actively managed hedge funds could prove to be an extremely regretful and spectacularly ill-timed decision.

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[8] Being short equity markets played a significant part in the relative outperformance of trend followers in 2008. This potential to get short has since played a significant part in the recent *underperformance* of trend following relative to simpler strategies like passive long equities or risk-parity equity-bond portfolios. The reason is that the realised cost of the 'insurance' element of trend following has been high given the nature of the price action. Whenever trend followers have reduced positions as prices have fallen back, the market has rebounded generating losses. The flip-side of this is that short-term mean reversion strategies have fared very well.

[9] Typical complementary strategies are seasonality, short-term mean reversion, carry and roll-down, cross-sectional spread trading, pattern recognition (usually short-term), single-stock equity strategies, volatility selling, risk-premia selling more generally and various forms of 'value' that can mean different things to different people.

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