



The Role of Risk Parity in March 2020's extreme bond market breakdown

March 2020 was a shocking month for anyone in the bond and MBS markets. The week from 3/18/2020 to 3/25/2020 was among the most volatile in bond market history. In less than a week we saw declines in bond prices that would normally take many months of grinding down to accomplish, such as between 2007 and 2009.

March had unprecedented MBS BWIC volumes from asset managers that received margin calls or were forced sellers due to redemptions. These included Mutual Funds, Hedge Funds, and REITs. Many more hedge funds 'dropped gates', suspended redemptions and/or are closing down, hoping for an orderly return of capital. Many funds and products with explicit leverage, such as REITs, or levered Credit exposure, such as High Yield bonds and levered MBS Credit (subordinate and mezz bonds), took massive -50+% dives. Large bond ETFs, like the AGG, ended up at significant discounts to NAV, as investors sold and shorted ETFs to sell the risk of the bonds they could not sell. (See "AGG Equity NAV <GO>" on Bloomberg).

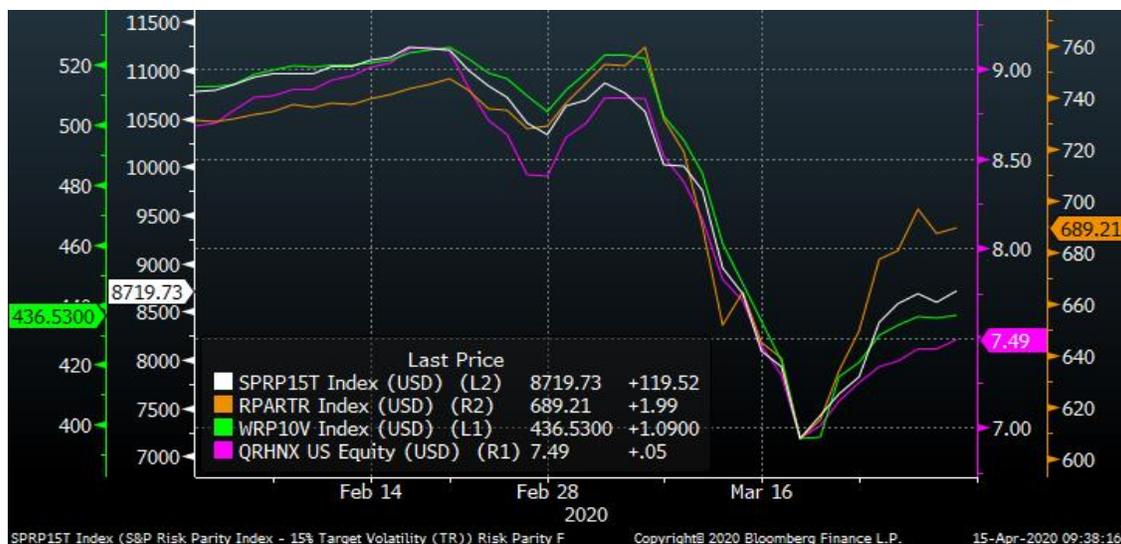
These violent moves resulted in a race for cash, with T-bills being offered at negative yields. Any asset class that could be sold, was sold, and by many, often at a steep discount.

Why did bond markets fail in March 2020? A Review of Risk Parity.

Like most bond managers, I too had drawdowns in March. It upsets me to lose money for my clients, and it is important to me to understand the why for the extreme drawdown in the month. I needed to identify the root cause behind the market losses in our MBS portfolio, and who was responsible. At least some other investors must feel the same way. For that reason, I am sharing the analysis below, and my conclusions.

Numerous news outlets have blamed the breakdown of Risk-Parity ("RP") strategies for the volatility in bond markets in March 2020, resulting in massive selling that overwhelmed the ability of dealer balance-sheets to absorb the sales. **Fixed Income as a volatility reducer and hedge for equities broke down at points in March, with both asset classes declining at the same time.** Both US Treasuries and S&P Equity futures, normally the two most liquid assets, showed terrible liquidity in March, leaving other asset classes including MBS hanging, begging for bids that did not materialize.

Risk Parity had a horrible month too, especially for an 'asset class' that is meant to be stable. I suspect the various fund providers are all highly correlated. (Graphed are 3 different Risk Parity indices and one of AQR's Risk Parity funds – used since the data is available on Bloomberg, and not to single it out).



<https://www.ft.com/content/3ab66a1c-6578-11ea-b3f3-fe4680ea68b5>

“Risk parity funds, automated investment vehicles pioneered by the hedge fund manager Ray Dalio and designed to do well in almost any market environment, were among the big casualties of financial markets’ wild week, suffering their worst performance since the depths of the credit crisis and the second-worst on record... Like many funds, risk parity vehicles invest in a broad array of assets but they get their name because they try to keep the relative volatility of each component equal and constant. Bonds are less volatile than stocks or commodities, so risk parity funds typically use leverage to increase their exposure to safer fixed income, which should act as a counterweight if equities are rocky.”

<https://www.aqr.com/Insights/Research/White-Papers/Understanding-Risk-Parity>

<https://www.aqr.com/Insights/Perspectives/Risk-Parity-Why-We-Lever>

<https://us.spindices.com/documents/methodologies/methodology-sp-risk-parity-indices.pdf>

https://supplements.pionline.com/uploads/supplements/SPIIndices_Research-Indexing-Risk-Parity-Strategies.pdf

The typical RP fund owns long levered exposures (usually via Futures) in Global Equities (111%), Global Fixed Income (250%) and many Commodities (95%), implying over 4x exposures relative to client equity.

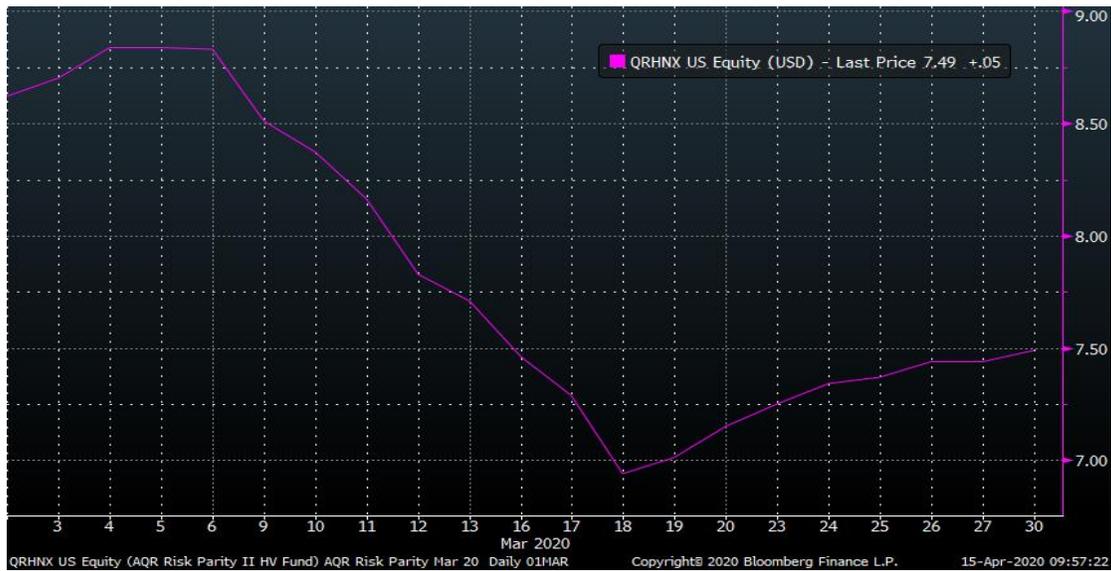
Bridgewater and AQR are probably the largest managers of Risk-Parity Strategies. Many other managers also have Risk-Parity funds. It is estimated that \$300b to \$400b in AUM is in RP. With bonds having 250% allocations, my guess is that over \$1T in bonds are held by RP funds.

Due to the high levels of leverage involved in the bond allocations of Risk Parity funds, it is plausible that their selling of bonds consumed available dealer liquidity and resulted in the subsequent forced

deleveraging by other players. The blame for the lack of liquidity that exists in the market can be partly attributed to the misguided and flawed Dodd-Frank Wall Street Reform and Consumer Protection Act, which crippled the ability of even well capitalized banks to provide liquidity through market making, as Dodd-Frank effectively outlawed 'prop-trading'. Banks now reach out to their customers for bids, which does not work in times of deleveraging, as the clients are also sellers, going in the same direction with the same kinds of bonds.

Assuming that the Risk Parity is to blame, this still does not explain why the Risk Parity portfolios sold bonds in the first place in March.

A closer look at March 2020: March 9th is when RP returns started declining, till March 18th.



Equities had already been declining in February, and continued declining from March 1 through March 23. Bonds exhibited inverse correlations (declining yields) only till March 9th, when yields spiked upwards by 25+bps in 1 day, and 65bps by the 18th! **Certainly, the inverse correlation between stocks and bonds broke for 2 weeks.**



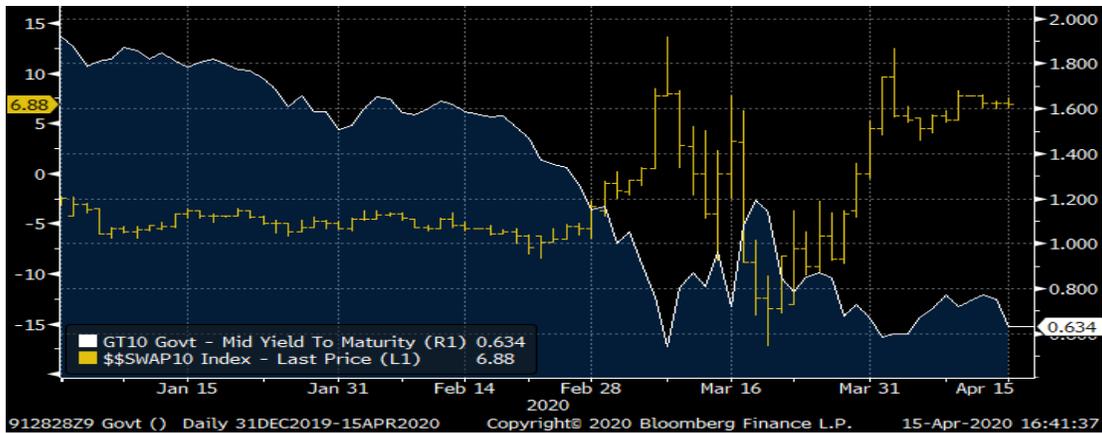
The spontaneous rise in rates on March 9th probably did result in the declines in Risk-Parity and a failure of its core thesis, and it is possible that the subsequent deleveraging of their bond portfolios further accelerated the decline in bond prices.

But, did RP cause the rise in rates?

A closer look at March 9th shows two jumps in UST 10 year yields – at 3:23am and 9:45am EST.



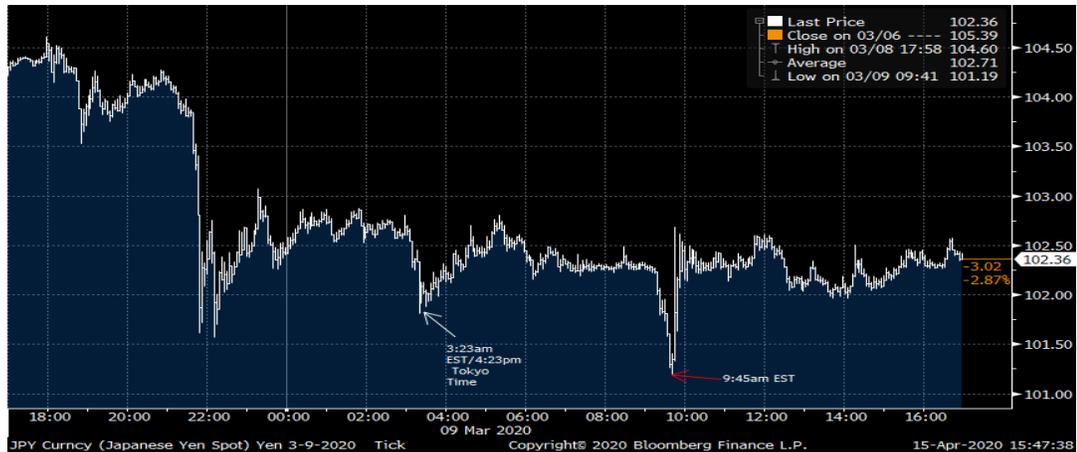
Swap spreads verify that USTs were being sold. Volatility in swap spreads implies flows in USTs. Swap spreads traditionally represent the yield premium over USTs required for high grade credit. They tend to be relatively stable. **When USTs are sold, swap spreads tighten.** However periodic central bank UST activity makes them very risky to use as benchmarks or hedges. (I have been writing about the relationship between MBS and swaps since the late 1980s – see the Analysis section of our website).



The linkage from the UST selloff to the MBS margin calls of mREITs could have been interest rate swaps, that are often used to hedge. Tighter swaps, along with the attendant convexity mismatch between bullet dated hedges and callable MBS (convexity drift, delta hedging, etc) could have resulted in additional UST selling and also calls for more collateral.

A number of key events occurred on March 9th:

- An oil price war started, with the biggest drop in oil prices since 1991 (see graph below)
- The UST 10 year (above) gapped up in response to the increased risk on the 9th – as expected
- The Yen had broken 104 on the 8th, (from 112.1 on Feb 20), and broke through 102 on the 9th – as expected
- At 3:23am, the Yen suddenly weakened from 101.86 to 102.81

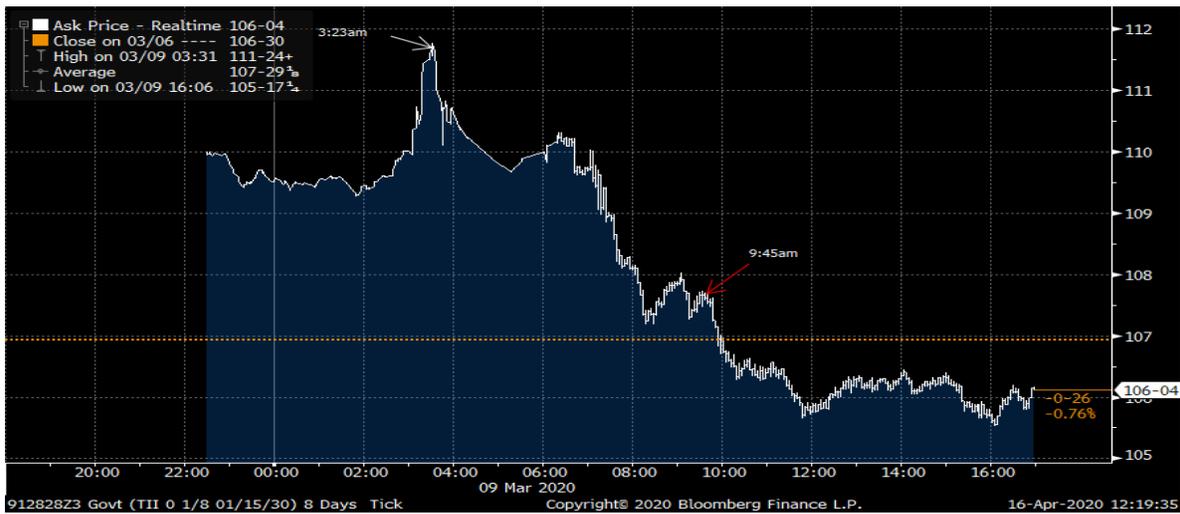


- When the US stock market opened on 3/9/2020, Equities plummeted (<7%) from the start of trading, triggering circuit breakers, after declining 8% in Feb
- Yen strengthened with the selloff in equities at the US open, from 102.23 to 101.19, as Yen-Carry-Levered quants delevered
- At 9:45am, Yen suddenly weakened again, from 101.19 to 102.65

The reaction of the Yen was strange. The BOJ is usually the marginal buyer and seller of USTs, but if Japan sold USTs, the Yen should have strengthened, not weakened. So someone else sold both USTs and Yen!

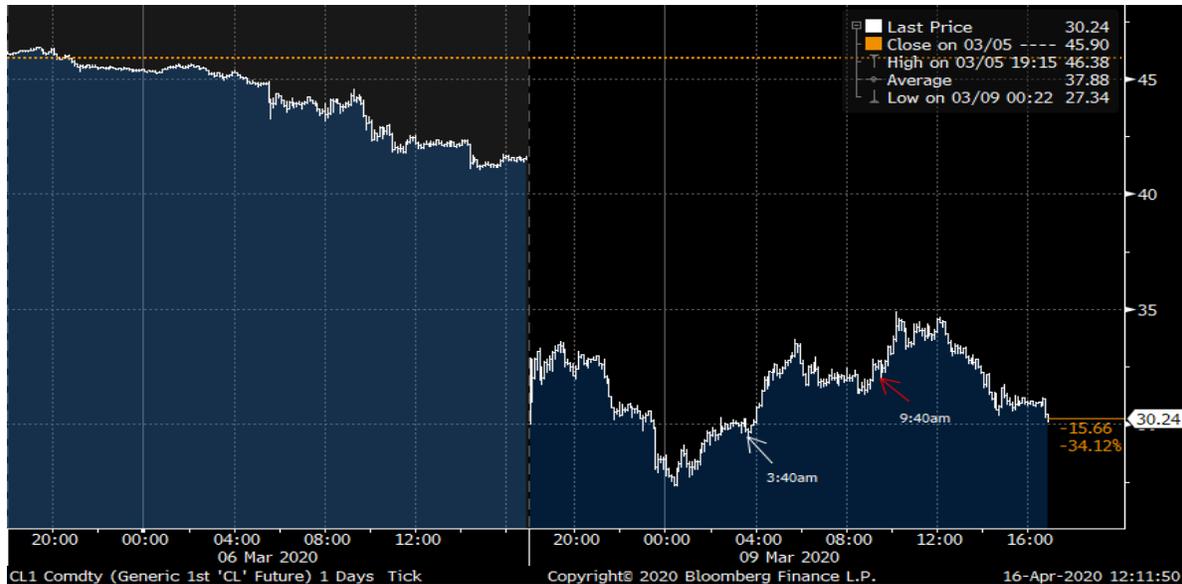
If the bond market selloff was caused by RP automatically debalancing, many other typical assets owned by RP funds would also be sold, or bought, at the same time. So we checked a few other assets to see what else was being bought or sold at the same times on March 9th.

TIPS – prices declined from 111-24 to 105-17 with gap downs at 3:23am and 9:45am – check - were being sold.



Crude Oil – Aha – a smoking gun?

As markets opened on 3/9/2020, USTs and Yen had gapped up while Crude had gapped down. The CL futures rallied at both 3:40am and 9:40 am on March 9th.



At 3:23am and 9:45am, someone automatically sold USTs and Yen and then purchased Crude Oil.

Risk Parity Rebalancing Process

RP funds can differ in their rebalancing process (the underlining and bolding in the quote below is my emphasis). We also do not know how frequently they rebalance – hourly, daily, weekly, quarterly?

<https://investresolve.com/blog/risk-parity-isnt-the-problem-its-the-solution/>

*While all RP implementations apply the concepts described above, they can implement them in more than one way. For example, the progenitor of RP products is Bridgewater's All Weather Portfolio. Bridgewater analyses the fundamental relationships between assets and different economic regimes to construct a strategic RP allocation. **In other words, the All Weather fund has a relatively static asset allocation, and rebalances back to this allocation on a regular basis.** As such, it acts counter-cyclically **by buying assets that have gone down the most and selling assets that have gone up the most.** This implementation actually moderates the behavior of market...*

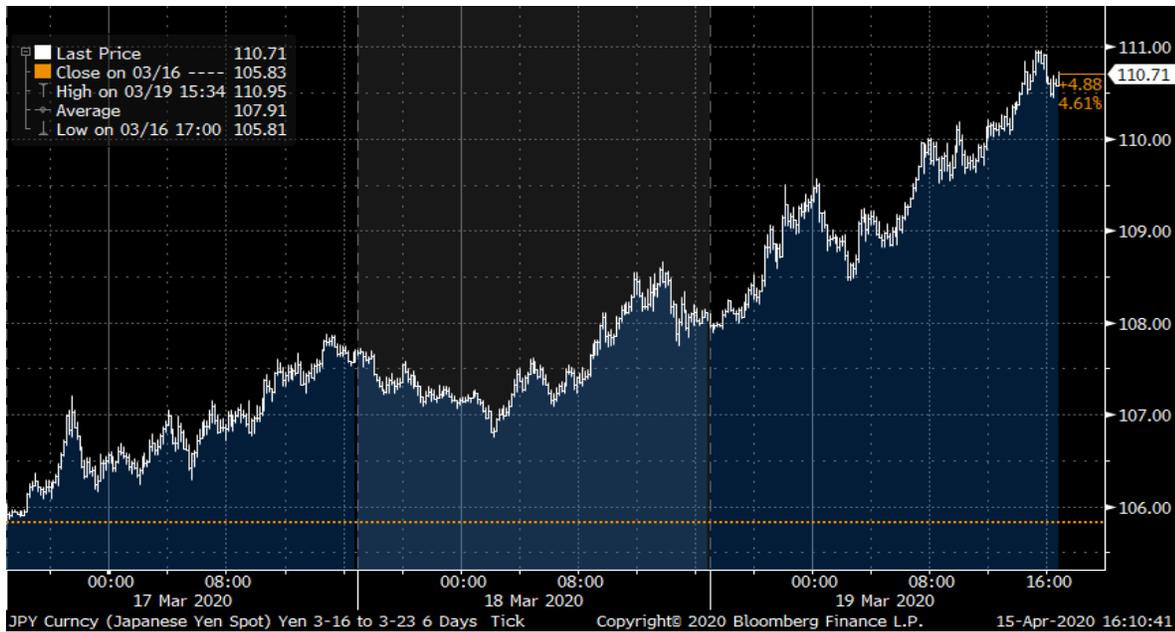
Other RP methodologies are more dynamic. Portfolios are altered regularly in response to changes in observed correlations and risks across global asset classes. All things equal, if an asset class starts to exhibit higher risk, and/or higher correlations with other assets in the portfolio,

these dynamic approaches will reduce exposure to this asset class in favor of other assets in the portfolio.

My suspicion is that a static asset allocation RP algorithm rebalanced their risk allocation into underperforming assets – Oil - and out of outperforming assets – Bonds and Yen - and set the ball rolling that demolished the liquidity in Fixed Income markets in the following weeks. If the information above is correct, it could be Bridgewater’s All Weather Fund (I could not find information on AQR's rebalancing process).

The selling of Yen and bonds/USTs continued into the following week, from March 17th to the 19th, the week in which the bond markets broke – both USTs and Yen were being sold, along with Equities.





Just like in 2007, the initial and subsequent deleveraging in equities was triggered by the rate cuts of our central bank, not once but twice, this time in response to COVID-19. Powell, just like his predecessors, continues the tradition of not understanding how interest rate policies work in a world of free global capital movements, and how they impact money supply, asset prices, and leverage.

The first Powell emergency rate cut on March 3rd pushed equities off the edge, Yen started strengthening, and, as expected, US Treasuries received a flight to quality bid. This forced RP to rebalance after the Oil price shock. The March 15th 1% cut added more fuel to the fire. Bonds gapped up on the 16th and Yen initially rallied when equities sold off.

Swap spreads on the 17th and 18th tell us that blocks of bonds got sold multiple times, with gaps down at numerous times, including 12:25pm on the 17th, 2pm on the 17th, and 12:30pm on the 18th.



It is possible, and probable, that that RP rebalanced on the 17th, again breaking the Equity-Bond negative correlation.

This second week is more complicated to analyze due to various central banks also coordinating their efforts to supply dollars and implementing QE. For example, the BOJ announced more QE through ETF and REIT purchases on the 16th, reversing the Yen's strength.

This is just a guess: it also appears that the Euro-carry trade unwound on the 18th, strengthening the Euro at the expense of US and maybe Japanese stocks, which might have triggered RP to buy US equities, Japanese equities, and crude oil on the afternoon of the 18th, while selling bonds and TIPS. Such a portfolio could result in the rebound in the return for RP indices on the 18th and 19th, and the return to the standard inverse correlation between bonds and equities.

Too late for the levered MBS and bond funds however.



Conclusions

The Oil Price War between Saudi Arabia and Russia was the triggering event for the failure of the Bond Market via the rebalancing actions of Risk Parity. Without Risk Parity, this could have been a good thing globally, as low oil prices imply low inflation. Outside of oil-patch employment, GDP growth is usually correlated with cheap energy. Large Treasury bond sales resulted in tightening of swap spreads, causing the hedges of levered bond and MBS investors to require more collateral and thus resulted in the deleveraging we experienced.

Risk Parity is an interesting investment and asset allocation concept that has been executed by the quant firms in a flawed manner using correlations based on decades of old historical data. The framework they use has not adapted to the dynamic changes in global markets and macro-economics that began in the 1990s, nor been sized to reflect the changes in market liquidity over the past decade. **Their automated and AI driven strategies, with significant size and leverage, and without a human hand on the wheel, have created systemic risk.**

Institutional Asset Allocators – primarily Pension Plans and Endowments – should reconsider their allocations to Risk Parity and similar automated strategies. Their ‘small’ percentage allocations to ‘hedge funds’ or ‘alternative assets’ have resulted in 20% to 30% drops in the value of their entire portfolios, many tens of Trillions of dollars, a risk and correlation that they never imagined. Their ability to meet their future obligations is now also at risk.

The losses in asset valuations in bond markets and equities are now significantly greater than what the COVID related losses would have been on their own, due to the forced deleveraging that has occurred. Employment losses will also be greater as the economy has lost the currency that has facilitated growth and innovation – high PE stocks. In ESG terms, there has been a significant Social cost as well. This will snowball into many other asset classes, such as Real Estate and Venture Capital.

Global Central banks have instituted unlimited QE and helicopter money in response, creating debt that future generations will struggle to pay off.

The fundamental problem remains leverage. Central banks continue to use their balance sheets to re-leverage economies after the every crisis . Every time a central bank responds to a crisis by providing the balance sheet to replace lost leverage, facilitating re-leveraging, the next crisis becomes larger, since most resulting earnings tend to be artificial, and the debt is never paid down.

Even the act of paying down government debt creates risk – for example when the Clinton T-Bill supply reduction in 1997 led to LTCM failing in 1998 and another bailout. Or 2013’s Taper Tantrum, that cemented the size of the Fed’s balance sheet. While bailouts and artificial money supply can lead to long periods of “good times”, when the good times end, the subsequent crash is always mightier than the prior one!

Our current crisis is a result of the cumulative central bank supplied leverage growth in response to Japan’s bank failures in the 1980s, LTCM (1997-98), Dot-com/2001-2002, GFC (2007-2011), and Taper Tantrum (2013), plus the ECB (2012-present) and Japan’s (1990-present) ever-growing QE and balance sheets, with each subsequent crisis requiring an even larger bailout and debt and leverage creation. This central bank derived money supply has supported asset inflation in every asset class that can be leveraged, most notably equities, corporate bonds, and real estate, creating expectation of bailouts (the Fed “Put”) and impunity in risk taking (not to mention social problems such as income inequality).

Had Powell not cut the Fed Funds rate, then equities would not have sold off as much, then bonds would have not rallied in response to the equity selloff, and maybe Risk Parity might not have sold bonds to rebalance. Powell too has responsibility here for not understanding the system, and having a dogmatic understanding of interest rate policy and economics. My grade for the Fed is not the ‘A’ various TV talking heads are giving them. After all, ‘F’ is for Fed.

In addition to the economic disaster we are in, the Fed has made financial markets and wall street employees obsolete, and markets no longer serve a price discovery and risk pricing function. Finance and the discipline from markets have been obliterated. Expect banks to roll out Level 3 assets once again instead of taking losses and downsizing.

As always, we welcome your questions and comments. Stay safe at home, wear a mask and gloves when venturing out, and re-read my [Crisis Notes](#), [The Failure of Macro Economics](#), and [T-Leaf Reading](#) if you have time.

Regards, Samir Shah

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