

Should you be Worried about Liquidity in the Markets?

Let's begin with a lay investor's definition of liquidity: the ease with which an asset can be converted to cash at very close to its fair, recent price. We normally take market liquidity for granted, but in fact, liquidity is often not there just when we need it most.

There are no assets that can't be affected by illiquidity. Take cash itself. If you buy a 30-day CD and suddenly need your money in fifteen days, you may get your cash, but only minus a "penalty for early withdrawal." Maybe you have your cash in a simple checking account and now you want some of that cash. Not so fast if you're a Greek citizen! You might only get \$66 a day and you'll have to stand in line for hours to get that.

It's also important to recognize the difference between true liquidity and liquidity-at-a-price. Listed stocks are "liquid," but in a market panic prices can easily gap down. It's not that you can't sell, but you won't necessarily get the price you thought you were going to get. Put another way, your stock positions are almost *never* worth what you see on a portfolio report—that just captures the last traded price before the report was printed. Usually it's a pretty good approximation for value (before fees and commissions) but during periods of extreme market stress, realized value can deviate a lot—and quickly—from very recent price quotes.

The cost of illiquidity can also be measured in time, rather than in dollars. The 30-day CD is a case in point. Or consider that you just bought \$1 million of a 10-year, B-rated bond issue and the very next day the company was downgraded. You now have a mark-to-market loss, but if you can't afford to realize that loss, all you have to do is wait ten years and you'll likely be paid in full.

Note that there are also securities that are inherently illiquid if they need to be sold quickly. Certain small bond issues, for example, are so thinly traded that it might take you several days—or longer—to dribble the sale out to the market. If you suddenly need full liquidity, you might find that you get no bids on the bonds at all.

THE LIQUIDITY PREMIUM

Most of the time, the market rewards investors for bearing illiquidity. A 30-day CD will yield slightly more than a demand deposit. A small, thinly-traded bond issue will yield more than a similarly rated large issue. But it's important to keep in mind that the premium embedded in the price of illiquid securities is based on the assumption that a typical buyer of the security can withstand the illiquidity as long as he is compensated for it. If you make the mistake of underestimating your need for liquidity, you're on your own. If the degree of liquidity changes from what is expected or "normal," that is a different problem—one we address later.

We can examine the costs of illiquidity by comparing the outcome experienced by an investor who didn't misjudge her need for liquidity with the outcome experienced by an investor who did. Consider Alice, who owns a \$1 million portfolio half invested in stocks and half in bonds with very low yields. Her next door neighbor, Jack, owns a \$1 million portfolio entirely invested in stocks. Both spend \$50,000 a year from the portfolio.

If you suggest to Jack that his portfolio might be a bit on the risky side, he will chuckle and remind you that stocks are extremely liquid. He can sell any of his stocks—or all of them at once—any time the markets are open. And since his \$1 million portfolio is minuscule compared to the trading volume in the markets, a sale by him won't affect prices. He has full liquidity and there is no cost associated with it.

Along comes the Financial Crisis and bad things begin to happen. It turns out that a great many people under-estimated their desire for liquidity, and they all flood the market with sell orders at the same time. The Dow plummets, prices fall, trading is halted in certain shares that are getting especially pounded, and then trading is briefly halted in the entire market.

When the smoke clears, Jack's portfolio has declined by 40%. In addition, he still needs his \$50,000, so his total portfolio value is now \$550,000. Jack is getting a bad case of the heebie-jeebies, and his mental state isn't improved when his financial advisors start pressuring him. They convene a meeting with Jack and point out that he is now withdrawing 9% of his portfolio every year, a wildly unsustainable rate.

But Jack takes a deep breath and toughs it out for another year. The market is flat, but Jack still needed his \$50,000, so two years after the crisis he now has \$500,000 – half of what he started with. He's now spending 10% of the portfolio every year and at that point he bites the bullet and

sells out. Not wishing to experience personal bankruptcy, Jack goes back to his possibly-sustainable withdrawal rate of 5%, except that he's now getting only \$25,000 a year. And since he's now in cash, he misses a quantitative easing powered rally that drives large stock market returns in the third year after the crisis. Things are not good around Jack's household.

Meanwhile, chez Alice, matters are proceeding quite differently. When the equity markets dropped 40%, Alice's portfolio declined to \$800,000. Alice needed her annual \$50,000, but she didn't get it by selling liquid-only-at-a-price stocks, she got it by selling her most liquid bonds, which had that characteristic because they were also the highest quality ones and saw little or no decline in price. The following year, the market was flat and Alice spent another \$50,000 from her bond fund, leaving her with \$700,000 at the same point when Jack's portfolio was worth \$500,000. But then, courtesy of her friends at the Fed, QE kicked in and Alice's stocks—she still owned all of the shares—doubled in the third year. By the end of that year, net of her \$50,000 withdrawal, her portfolio is nearly back to where she started, with \$400,000 in bonds and \$550,000 in stocks (assuming she made her \$50,000 withdrawal that year from her stock portfolio). Maintaining a 5% withdrawal rate at that point means that her ongoing cash flow is \$47,500—pretty close to her original \$50,000 target.

As this little chronicle suggests, liquidity can be ephemeral, and it's easy to conflate liquidity with a supposed lack of volatility. It's useful to keep in mind that when we say that investors are compensated for bearing illiquidity, we actually mean something quite narrow: we are compensated for bearing illiquidity under normal market conditions and assuming we have correctly judged our need for liquidity in the first place. Those are some big caveats.

MACRO LIQUIDITY AND MICRO ILLIQUIDITY

“Global liquidity has been plentiful thanks to years of monetary easing by central banks. Yet...market liquidity has gone in the opposite direction.”
– BlackRock¹

Since the Financial Crisis, the major central bankers of the world have been injecting liquidity into the world's largest economies: the US, Europe, Japan, China. They do this mainly via so-called “quantitative easing,” or QE, by buying vast amounts of bonds in the marketplace.

¹ “The Liquidity Challenge: Exploring and Exploiting (II) Liquidity,” BlackRock Investment Institute, June 2014.

As the price of bonds rises (due to this huge-but-artificial-demand), bond yields drop. Investors who need yield—which is most investors—begin to search for that yield elsewhere. As they do, they drive up the price of risk assets like stocks, high yield bonds, real estate, whatever gives them a decent yield.

As bond yields plunge, corporations issue more and more bonds, because doing so is cheap. These newly issued bonds might be used to redeem higher cost bonds issued years ago, or the proceeds might be used for various corporate transactions. Since opportunities for productive use of capital aren't plentiful in a global slow-growth world, much of this money finds its way back to shareholders via dividends, stock repurchases, and so on. The shareholders use this liquidity to buy more risk assets.

But as we'll see (below), this massive increase in macro liquidity isn't matched by "micro" liquidity, that is, the ability to trade without affecting price. Instead, micro liquidity has plunged since the Financial Crisis.

If we didn't suffer from a macro liquidity glut, or if we didn't suffer from micro illiquidity, we might not have a problem. The problem arises because we have both.

LIQUIDITY IN THE BOND MARKETS

If we want to understand whether we should be worried about liquidity in the bond markets, we have to understand something about how bonds are bought and sold.

We'll start, as we should, with the broker-dealers of the world. These folks are called broker-dealers for a reason: they sometimes operate as brokers, usually on the equity side of the house, and sometimes as dealers, usually on the bond side of the house. And there's a world of difference.

Suppose you are investor A and are managing a large equity mutual fund and you want to sell some stock. Your trading desk contacts B, a broker, who matches you up with investor C, who wants to buy those stocks. B, the broker, isn't really a central player in this transaction. He's a matchmaker who charges a (hopefully small) commission for his efforts. Like Match.com, the broker introduces the party of the first part to the party of the second part, but doesn't actually go out on the date.

But now suppose you, A, are instead the portfolio manager of a *bond* mutual fund and you want to sell some bonds. Your trading desk contacts D, a dealer, who will bid on your bonds with the idea of buying them, then marking them up and selling them to C. In fact, your trading desk will contact a great many bond dealers and seek bids: a large bond fund may deal regularly with thirty or forty dealers. Once your trading desk has identified the high bidder, that bidder is contacted and informed that he suffers from the “winner’s curse:” the good news is, he owns the bonds. The bad news is, he paid more for them than anyone else was willing to pay.

Unlike the broker side of the broker-dealer house, the dealer side actually commits the firm’s capital. True, the dealer might buy the bonds from A—you—and sell them instantly to C. But the dealer might also end up holding the bonds in his inventory for some extended period of time, probably because he couldn’t sell them at a profit.

Brokers are almost incidental to the buy-sell transaction and are gradually being replaced by computerized systems, but dealers are integral to the transaction. They are committing their capital and making markets in bonds, and if liquidity is going to be good or bad in the bond markets, it’s likely going to be good or bad because of what these dealers are doing. So who are these people?

Bond dealers range from the usual subjects—large banks and investment banks and wirehouses like JP Morgan, Citi, Merrill, Goldman, Morgan Stanley—to small, regional boutiques few have ever heard of. When A’s trading desk solicits bids on a specific issue of bonds, it’s these dealers who respond by submitting the bids and standing behind those bids.

Of course, every dealer doesn’t bid on every transaction. Some dealers, especially the smaller houses, like to specialize in certain kinds of bonds. Some dealers may be capital-constrained at the moment. But, under normal circumstances, a lot of dealers will bid and A’s transaction will close smoothly.

What can go wrong? If you listen to people like Jamie Dimon, Chairman and CEO of JP Morgan, the answer is “a lot.” Naturally, it’s important to remember that Dimon never met a regulation he didn’t hate, but even so, he runs an institution that is extremely important to the health of the bond market, so let’s look at what he says we should worry about.²

² JP Morgan Chase Annual Report 2014

Dimon claims that, while the folks who wrote Dodd-Frank were trying to prevent the next financial crisis, what they've actually done was to increase the odds that it will happen. The mistakes Dodd-Frank makes are many and deplorable (according to Dimon), but there are two we should be thinking about for our purposes today:

First, Dodd-Frank—and Basel III—raise capital requirements on banks across-the-board. Since banks now have to use their precious capital in other ways, there is less of it available to use making markets in bonds. This mainly affects the banks' so-called "front book," the inventory of bonds banks keep on hand to facilitate trading and make markets. As bank capital has migrated elsewhere to meet the higher reserve requirements, the front book has declined precipitously. We'll take a look at this phenomenon in a moment.

Second, Dodd-Frank wants to reduce risk-taking by banks, which affects the "back book," or "prop book," where banks trade with their own proprietary capital. Regulatory constraints imposed on the prop book is known as the Volker rule. Like the front book, the prop books of banks have shriveled post-Dodd-Frank.³

There is little doubt that Dimon is right when he warns that banks' ability to maintain liquidity, avoid order imbalances and ensure the smooth functioning of the bond markets has been significantly reduced. And there's another reason why bond inventories have declined at banks. Other government actions – in this case the Fed – have caused interest rates to decline to historically low levels. In the good old days—pre-2008—a bank holding a large inventory of bonds on its books was at least getting a nice current return while it was holding them. But today, with returns perilously close to zero, the current return doesn't justify the risk.

To put some numbers around all this, consider that in 2007 bank inventories of corporate bonds totaled close to \$300 billion. That was against a total US corporate bond market of just under \$2 trillion. Today, dealer positions have shrunk to about \$60 billion against a vastly expanded corporate bond market of \$3.7 trillion.

³ We're focusing on bond dealers who are large banks because, at the end of the day, they are the ones who matter. These are the dealers who maintain so-called "deep" inventories of bonds. The smaller, regional dealers add liquidity to the bond markets on a day-to-day basis, but they are too small to make up for bank-dealer liquidity if the deeper players should go away.

Another way of looking at this is to compare the size of dealer inventories (where liquidity is maintained) with the size of bond investment funds, which need the liquidity. According to the Fed, in 2007 bond funds held three times the amount of bonds held in dealer inventories. Today, bond funds hold *twenty times* the dealer inventory.

Similarly, over roughly the same period of time, as the corporate bond market was almost doubling, the amount of capital invested in bond ETFs grew 25X, from \$3.9 billion to \$100 billion.⁴

All this sounds alarming, but does it really matter?

MEASURING LIQUIDITY

Unfortunately, there is no single measure of liquidity that we can assess and be comforted or terrified by, i.e., there is no counterpart to the VIX, a measure of implied volatility in the equity markets.⁵ Instead, if we want to understand whether liquidity in the bond markets is good or bad—deep or shallow—we have to vector in on the subject from several different directions.

Students of the bond markets measure liquidity by looking at these (and a few other) metrics:⁶

Tightness, a measure of how high or low transaction costs are, typically measured by the width of bid-ask spreads.

Immediacy, a measure of how quickly (time being money) orders can be executed and thus how efficiently trading, clearing and settlement systems are working. Immediacy can be roughly measured by the size of dealer balance sheets and by how willing the dealer market is to commit its capital.

Depth, i.e., how abundant buyers and sellers are, especially at prices close to fundamental value. Depth can be estimated by looking both at bid-ask spreads and also the ratio of buy orders to sell orders.

Resiliency, that is, how quickly order imbalances, which tend to move markets away from fundamental value, are corrected by new order flow.

⁴ Matthew Tucker and Stephen Laipply, “Fixed Income ETFs and the Corporate Bond Liquidity Challenge,” – iShares by BlackRock, 2015.

⁵ The word “implied” is important. The VIX measures market participants’ expectations for volatility over the next thirty days, and those expectations can, of course, turn out to be very wrong. By the way, “VIX” is simply the ticker symbol for the CBOE Volatility Index.

⁶ See, e.g., Abdourahmane Sarr and Tonny Lybek, “Measuring Liquidity in Financial Markets,” IMF Working Paper, December 2002.

Earlier this year Morgan Stanley published a paper in which it examined these metrics, as well as a few others (including volatility) in the corporate high yield bond market.⁷ Their conclusion was that while dollar and trade volumes were robust post-Financial Crisis, other metrics were more worrisome. Specifically, market turnover had declined, trade sizes were lower and volatility was higher controlling for trade size.

The paper then constructed a factor model to examine whether or not junk bond investors were being appropriately compensated for reduced liquidity. The model broke down high yield spreads over risk-free rates into three components, (1) default risk, (2) market risk, and (3) liquidity risk, and concluded that 218 basis points (bps) of the total high yield spread reflected liquidity risk. And since Morgan Stanley estimated that the fair cost of the challenging liquidity environment was only about 116 bps, then, in effect, investors were actually being *overcompensated* for bearing illiquidity.

How comforted should we be by this analysis? The Morgan Stanley paper was directed to a specific subset of the firm's customers, i.e., investors who are interested in buying and selling junk bonds but who are worried about illiquidity and whether they will be compensated for bearing that risk. Morgan Stanley's answer was, "Not to worry."

Obviously, under normal market conditions liquidity in the bond markets comes and goes; sometimes it's terrific and sometimes it's not. Most of the time investors are compensated for bearing illiquidity—otherwise, why would they accept it? —although the additional yield they get fluctuates widely. When Morgan Stanley writes a carefully researched paper concluding that liquidity isn't terrific but that investors are being overpaid to bear it, that's just what a bond trader wants to hear.

But other investors might be worried about something else, namely, what would happen to liquidity in the junk bond markets not under *normal* market conditions, but under *very stressful* conditions. And in this context it's useful to remember that we're worried about fragility in the junk markets today because of a Fed-engineered macro liquidity glut.

It's not precisely an iron law of capital market investing, but it's a good bet that wherever we find a liquidity glut, we will soon observe a liquidity crisis. This is because, as more and more liquidity

⁷ Adam Richmond, Meghan Robson and Jeff Fong, "A Premium for Liquidity," Leverage Finance Insights, Morgan Stanley, January 28, 2015.

comes into a market, investors buy *both* poor quality *and* average risk paper at prices that are way too high (i.e., at yields that are far too

low to adequately compensate for risks). We're not just talking about tulip bulbs in the shape of junk bonds—the impact of liquidity gluts driven by macro factors affects a very broad swath of asset classes.

By keeping interest rates low, and by buying massive quantities of high quality bonds via its quantitative easing program, the Fed made it very painful for investors to hold safe assets like cash and Treasuries. The European Central Bank and the Bank of Japan are now doing the same thing, only on a vastly larger scale relative to the size of their bond markets.⁸

On a global basis, then, investors have done what the central bankers wanted them to do, selling safer, low-yielding assets and buying more risky, higher-yielding assets. This pumped up prices of risk assets, including junk bonds, supposedly creating the “wealth effect” the Fed was seeking. People would feel richer and would spend more and economic growth would accelerate.

“The first lesson (about liquidity) is that the relative significance of the factors that determine liquidity under normal conditions and under stress can differ substantially.”

- Bank for International Settlements (Claudio Borio)⁹

For most investors the real question isn't about how liquidity behaves in a *normal* market environment, but about how liquidity is likely to behave in a *stressful* environment. Mostly, we have to speculate about this, but there are a couple of ways we might vector in on a conclusion.

For example, there have been a few post-Financial Crisis events that bear looking at and that might be instructive:

The “taper tantrum.” In May of 2013, then Fed chair Ben Bernanke remarked that, at some point, the Fed's QE program would have to slow down, that bond buying

⁸ According to Deutsche Bank, the Fed's QE program represented 86% of annual net issuance in the US bond market, the ECB's represents 262% of annual net issuance in the European bond market, and BOJ's represents 347% of annual net issuance in the Japanese bond market.

⁹ *Market Liquidity and Stress: Selected Issues and Policy Implications*, BIS Quarterly Review, November 2000.

would have to taper off. This was like remarking that, at some point, the sun will come up. But the markets reacted badly. Between Bernanke's remarks in May and mid-September, the yield on the 10-year US Treasury gained 140 basis points and the price of the bonds dropped almost 4%. In the Treasury bond market, those are big moves.

The "flash crash." On October 15, 2014 Treasury yields dropped 40 basis points in one day. Talk about a big move! According to Jamie Dimon, that move was "statistically [a] 7 to 8 standard deviation [event] – an unprecedented move – an event that is supposed to happen only once in every 3 billion years or so." What seems to have happened is that the day launched with heavy trading by investors betting on an improving economy. But that morning a small tsunami of negative economic data was released and Treasury yields plummeted. Trading activity was staggering, surpassing even the heavy volume observed following the collapse of Lehman Brothers.

The recent volatility in European sovereign bonds. Earlier this year yields on even longer term European sovereign bonds turned negative, an exceptionally rare event. Investors buying such bonds and holding them 'til maturity were guaranteed to lose money, but the bonds were in great demand anyway. This was The Greater Fool Theory in action: because of the ECB's huge QE program, traders believed yields would go even lower and the bonds could be sold at a profit. In fact, in late April yields rose and the wrong people turned out to be fools. When yields are very low to begin with, seemingly small changes in yield can send prices tumbling. By early May, yields on German bunds were six times higher than they'd been in mid-April, with correspondingly large losses of principal.

Anecdotal reports. We know that some credit-oriented hedge funds that faced heavy redemption activity earlier this year experienced serious difficulty liquidating positions to meet unexpected redemptions. By "serious difficulty," we mean the inability to sell some position at anything remotely like the most recent marks. And much more recently, we saw a different kind of liquidity risk emerge in the shares of primarily equity-oriented ETFs. On Monday August 24th, shares of ETFs meant to track the prices of liquid, high volume stocks—like the SPDR S&P Dividend ETF Fund and the

iShares Select Dividend Fund—saw enormous gap-down moves at the open on the order of 30-35%. In nearly all cases, the dramatic price action in the ETFs far overshot the real price moves in the stocks the ETFs were meant to duplicate.

CONTAINER PROBLEMS

We mention these anecdotal reports for two reasons—first because they are useful real-world data points that bring liquidity risks into the sharper focus. But second, they highlight knock-on effects that we call the “container” problem. In the case of bonds (or really any kind of security) held by a hedge fund or other partnership-based “container,” an investor is susceptible not just to the first-order liquidity characteristics of the holdings in that fund, but also to the terms of the fund.

The first aforementioned real-world example refers to a fund that had performed poorly in 2014 and required its investors to give notice of their intent to redeem several months before such a redemption would occur. This is customary and usually doesn’t introduce a lot of incremental risk. But in this case, a large number of limited partners wished to redeem and caused the fund to seek bids on several large (mostly bond) holdings that it sought to sell to achieve the required liquidity to meet redemptions. In doing so, the fund experienced a bit of surprising price discovery. One of its largest positions was not worth anywhere near what the last mark was, at least insofar as the dealers—who probably knew of the redemption pressure—were concerned. But the fund in question did *not* end up selling most of the bond position because the manager felt like it was worth more than this market bid.

Most readers at this point would expect the fund to segregate—or “side-pocket”—the problematic bond, and produce the required liquidity more slowly as bids normalized. But in a stark example of unintended consequences, this fund was created after 2007 and its terms reflected investors’ unease over the abuse of side-pockets. Rather than trying to come up with a creative solution—perhaps via a fund amendment—the manager just stuck the exiting investors with the very weak bond mark as they exited, even though the fund didn’t actually sell all of the position. None of this is unheard of or even a violation of fund terms—the fund acted as its documents said it would. But it is nonetheless a sobering reminder that even temporary liquidity problems can be made much worse by the container that holds client positions.

Similarly, the recent violent moves in equity ETFs also illustrate a container problem. In this case, the huge divergence between the trading prices of the ETFs and the stocks that the ETFs are meant to track arose from a variety of factors. One of the most acute was a temporary breakdown in the creation/exchange share system that ordinarily keeps a reasonably tight spread between the net asset value (“NAV”) and the ETF stock price. The ETF sponsors are still sorting out a lot of the underlying causes—high frequency trading is again getting a lot of attention—but the underlying fact remains that ETFs are functionally just a form of a closed-end fund. The gap between fund NAV and stock price can widen substantially if the institutional buyers and sellers, or “authorized participants,” who are responsible for facilitating the creation and redemption of ETF shares step back or are otherwise for some reason disrupted. In this case, the pain was relatively short-lived and, interestingly, did not impact most large bond ETFs. But the risk is clearly present and is worth considering since one of the purported benefits of ETFs over mutual funds and some other investment vehicles is that they are liquid throughout the trading day.

What, if anything, can we learn from these events? Not much, I’m afraid, but maybe two things:

First, while bond markets are certainly skittish, they aren’t ominously fragile. The taper tantrum was over in a few months and mainly offered nimble investors an opportunity to profit from oversold markets. The “flash crash” happened so quickly you’d have missed it if you’d gone to the kitchen for coffee: yields fell from 2.19% to 1.86% and back to 2.13% in mere minutes. And the excitement in the European bond market ended up hurting no one except speculators following The Greater Fool Theory.

Probably more important for most investors, stressed bond markets didn’t seem to transmit their viruses to the rest of the market.

*“As long as the music is playing, you’ve got to get up and dance...We’re still dancing.”
-Chuck Prince, former CEO of Citigroup,
regarding the bank’s ongoing lending to risky
deals in the summer of 2007.¹⁰*

¹⁰ *Financial Times*, July 9th, 2007.

CONTAGION

That last point—that recent sporadic liquidity risk hasn’t cascaded—is crucial, because the big risk we’re talking about here isn’t turmoil in any one sector of the market, but turmoil that rapidly transmits itself across all or most market sectors. It’s for that reason that, even if we don’t own a single junk bond, we need to worry about illiquidity in the high yield markets because of the possibility of financial *contagion*. People who didn’t own mortgage bonds still got badly hurt in 2007 – 2008 when an obscure corner of the mortgage market—engineered and facilitated in part by banks like the one that Chuck Prince ran—melted down. By focusing on how contagion works, we can zero in on what it is that could happen in the bond markets that should worry investors in general.

What is financial contagion? A good definition is this one: “Contagion is best defined as a significant increase in cross-market linkages after a shock to an individual [market sector] (or group of [sectors]), as measured by the degree to which asset prices ... move together across markets relative to this co-movement in tranquil times.”¹¹

In other words, junk bonds melt down and suddenly the stock market collapses. But why? How does contagion work? It can operate via several different channels. Here are a few examples:

Investor expectations. If junk bonds blow up, investors might suppose that all risk assets are in trouble. This could be a perfectly rational thought or it could be lunacy, but it’s a reflexive, self-fulfilling phenomenon. Everybody rushes for the exits at once, just as in a run on a bank that turned out to be sound (that is, it was sound before the run).

Game theory. You may know perfectly well that the junk market is blowing up for reasons that have specifically to do with conditions in Exotic Bond Land. But you also know that most investors—and especially most retail investors, who own gigantic chunks of junk bond mutual funds—don’t know this and are likely to sell indiscriminantly at the first sign of serious trouble. Not wanting to be the guy who has to turn out the lights, you sell immediately.

¹¹ Dornbusch, Park and Claessens, *Contagion: Understanding How It Spreads*, The World Bank Research Observer, vol.15, no. 2 (August 2000). This article is primarily about financial contagion from country to country, rather than from market sector to market sector. Hence the brackets in the quote.

Actual linkages. Suppose that a great many junk bond investors have bought on margin. When the margin calls come, these investors start selling whatever they can sell that isn't safe (i.e., not a US Treasury). Selling pressure hits the stock markets, where even more people have bought on margin. It gets ugly quick. This is a large part of what happened during the 2008 Financial Crisis.

VaR linkages. Banks, investment banks, mutual fund companies, large institutional investors and others monitor the risk levels in their portfolios constantly. When the value at risk (aka "VaR") numbers get too high, these folks don't just sell junk bonds, even though that's where the action is, they sell risk assets indiscriminantly.

How do we know whether frightening events in the bond markets are leading to nothing more than schadenfreude for junk bond owners or instead to Armageddon? Our best guess is that the real meltdown will come only when something substantive, not merely tantrum-inducing, happens. By "substantive," we mean a significant event that simultaneously surprises or frightens a wide swath of investors. For example, bond ETFs could seize up. Greece could descend into chaos at the same time that Britain decides to leave the EU. The Fed could raise rates faster than anyone expected or the market could react very badly to even a small rate rise. China could see broad-based unwinds in their currency and credit markets, making the "very hard landing" scenario incontrovertible. Perhaps the mere shift in Fed policy from adding to tightening macro liquidity could suddenly make micro illiquidity untenable. Most likely, though, it will be something nowhere on our mental horizon.

Under those conditions, it would no longer matter that bond market liquidity is more-or-less okay under normal conditions, because conditions have suddenly stopped being normal. It would no longer matter how contagion happens – that would be something for the history books to mull over. It would no longer matter that very high prices of risk assets could easily be justified by historically low interest rates or by slow-but-not-recessionary GDP growth. No, everyone would be suddenly riveted by alarming Shiller P/E's, by even more alarming P/E-to-GDP ratios, and by a suddenly-noticed bubble in household net worth that put the fourth quarter 2007 to shame.

MANAGING FOR A CONTAGIOUS LIQUIDITY TRAP

If we knew precisely how the next market collapse was going to happen, of course, we could prevent it. Unfortunately, we only know *in general* how it will happen: something unexpected will occur, investors will panic, and market sectors that were overpriced will be hard hit. Perhaps all that will happen is that we will move from a world of macro liquidity to a world of *less* macro liquidity. So for those of us who are concerned about such an event, or something like it, what is the best way to prepare for the possibility?

By far most important, we need to keep our greed instincts closely in check. Notwithstanding substantial declines in some risk assets in August and September of 2015, equity markets have been strong for the past five years, and they may stabilize and continue to be strong for some time. But we should keep our risk assets near their target weights, in part by taking profits from the big post-crisis run-up and in part by carefully rebalancing in the midst of renewed volatility. We may also want to avoid sectors that seem particularly overvalued and to invest our profits in out-of-favor sectors.

Assuming we can keep our greed in check, we should also force ourselves to think in a sober but realistic way about how much liquidity risk we're taking via the containers we are using—it's no good if we have a lot of assets with low intrinsic liquidity risks held in illiquid structures or poorly constructed ETFs. The same thought process should include careful consideration of when and what kind of liquidity we will have available if a liquidity-driven crisis occurs—that is the time when we will want to be a substantial *buyer* of assets that are experiencing extreme over-reactions in their bid/ask spreads.

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