High Yield Strategy

The Evolution of the Credit Cycle

Bank of America Merrill Lynch

13 October 2017

Slow and mature, this cycle refuses to turn

Welcome to our resumed coverage of US HY and leveraged finance credit strategy. We thought there is no better place to re-engage in a dialogue other than to try to address the central question on minds of many of our readers: where are we in this credit cycle? And while it sounds simple, anyone who has done this long enough knows how tricky it is. All previous cycles have ended with a surprise event, a "black swan" of sorts, which, by definition, was unexpected by the consensus and meaningful in its impact. This one is probably not going to be unique in this respect. And while forecasting the exact event is a futile exercise, we can still think about the general set of circumstances that could potentially turn this credit cycle.

And there are reasons for concern. Technically speaking it is now the longest compared to its three predecessors over the past thirty-plus years, or as far as the history of modern leveraged finance goes. Some measures of issuer debt leverage have risen to levels not normally seen outside of high default environments. In the meantime, central banks are stepping back from doing whatever it takes – which was their mantra for several years since the financial crisis – and focus on normalizing their policies. This backdrop gets further complicated by much volatility on the banks of the Potomac River, which nevertheless fails to produce any volatility in the vicinity of the Hudson River. A comprehensive tax reform that investors counted on earlier this year now seems a long shot, at least with respect to the likelihood of its comprehensiveness. Finally, the geopolitical arena has arguably become as – and arguably even more – complicated than it has been during the Cold War. Some key unresolved global issues that were sitting on the backburner for decades now appear to be reaching boiling temperatures simultaneously.

Yet there are good reasons for optimism too. The global economy is showing durable signs of improvement, and in particular in areas like Asian trade, EU recovery, and the US labor market. Measures of corporate debt leverage, while elevated in absolute terms, are still disproportionally affected by energy names to this day. In addition, they carry the weight of an offset of domestically-raised debt to offset earnings locked overseas by the largest multinational corporations. Furthermore, a good argument to be made that the cyclical clock has been set back a few hours to account for the energy 25%-default rate experience over the past two years. As a result, overall debt growth in this credit cycle has actually been relatively slow, compared to its predecessors. And even though central banks are now focusing on policy normalization, they have proven to be more dovish than market expectations every step of the way.

So it is a mixed picture, but we tend to view it as glass half full. This economic recovery has been unique in many aspects, and a slower and longer credit cycle appears to be one of them. Our default forecasting model identifies modified versions of implied volatility, market accessibility, and investor flows as key drivers of near-term defaults. As all these and some other measures are at very supportive levels, the model estimate suggests defaults could continue to stay low and perhaps get even lower. We formally forecast a full percentage point decline in US issuer default rate, from its latest reading of 3.3% in September (Moody's), down to 2.3% by this time next year.

Refer to important disclosures on page 13 to 14. **11792870**

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The evolution of the credit cycle

It has been too long. Way too long by the standards of its predecessors, and yet this credit cycle still shows few signs of an impending turn. At eight years and counting since the last time we saw a double-digit HY default rate, the current cycle has already outlived its predecessors of the past thirty years, or as far back as the history of modern HY corporate bond market goes. Previous episodes of debt buildups and cleansing have ranged between 5 years in 1984-1989, 7 years in 1992-1999, and 6 years in 2002-2008.

How much longer could this one last? This is the central question we will attempt to address in this report, and in doing so, lay the critical groundwork in support of our resumed coverage of the HY and leveraged loan credit markets. Before we turn to details of our approach to forecasting defaults, a couple of observations on conceptual design constraints we keep ourselves subject to. We are firm believers that the credit cycle leads the business cycle, as evidenced over the past thirty years, where credit conditions have tightened, spreads widened, and defaults increased well in advance of actual recessions arriving in Q3 1990, Q1 2001, and Q4 2008. For that reason, we think it is more difficult to build a sustainable default forecasting model based on indicators of economic activity, such as GDP growth, manufacturing activity, or employment trends. It is more likely to see credit conditions leading those economic indicators, and not the other way around.

Similarly, by design, we prevent ourselves from using indicators derived from credit market valuations in forecasting defaults. The ultimate goal of having a view on credit losses is to use it as the most critical component of your view on valuations. If the former came about as a function of the latter, it would be misleading to then turn around and take a view on valuations. Therefore, HY spreads and distress ratios – unquestionably correlated and leading indicators of defaults – are not the types of factors we can afford the luxury of including in our models. On the following pages we describe a set of indicators ranging from measures of volatility to debt accumulation and aggressiveness of new issues to market accessibility and flows, all of which we found to have the strongest leading relationships to HY default rates.

As readers of these pages will soon realize, we tend to believe that this cycle probably has more room to run before it turns. This view originates in our understanding that its longevity as well as debt accumulation may have been overestimated. Specifically, while this cycle technically started in 2009, the last time default rates descended from double-digit levels, there was the energy/commodity episode that claimed about a quarter of those names and pushed overall HY defaults to 6%. Given that an average cyclical peak sees defaults reaching 12%, we believe this experience should be taken into account in judging the longevity of the current cycle. Effectively, it has set the clock back somewhat, we think.

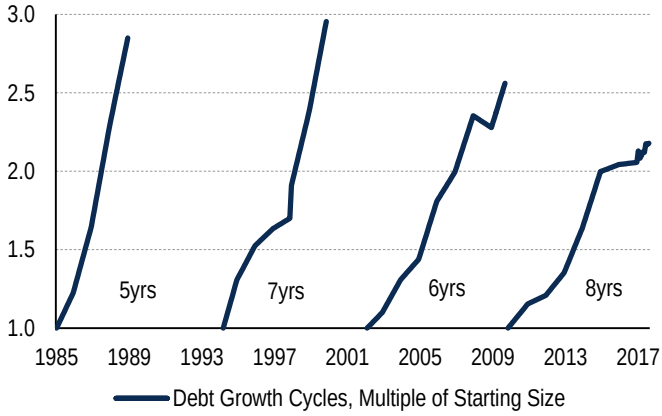
One known criticism of such an opinion is that because energy/commodity defaults were so concentrated and did not materially affect the rest of the HY market, this episode cannot be used as an argument for extending the cyclical clock. We do not view this question as black and white, and we give this criticism some weight in our judgment of credit market dynamics. We would note though that previous credit cycles have also been largely concentrated in a handful of sectors, like telecoms and steels in 2001-2002, and consumer discretionary in 2008-2009. So while the sector concentration argument carries some weight in our thinking, it does not invalidate this view altogether.

But enough about longevity; after all, cycles don't die because of old age, or otherwise our jobs would be too easy. They die because too much debt has been raised under too rosy a set of assumptions about corporate earnings. This is where we turn our conversation next. And interestingly, despite the senior age, this credit cycle still falls short of its predecessors in terms of debt accumulation. In Figure 1 we show cumulative

growth rates of leveraged finance debt outstanding[1] in each of the past four credit cycles, expresses as a multiple of the original debt stock. The chart makes it quite evident that even though this credit cycle is the longest time-wise, it is falling somewhat behind its predecessors in terms of debt accumulation (2.2x growth since 2009 vs 2.6x-3.0x range in the past).

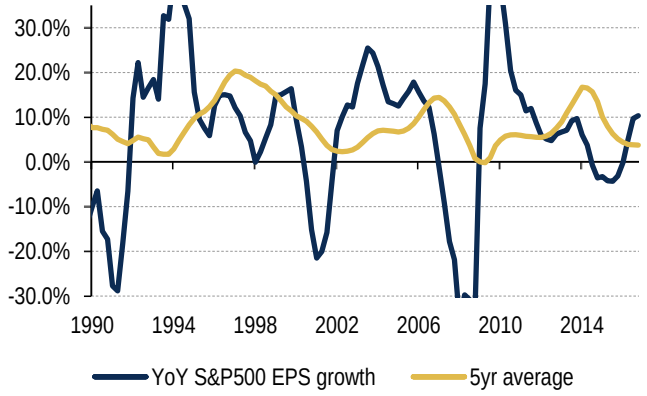
The other side of this question is earnings. Figure 2 shows how five-year growth rates (yellow line) have peaked out anywhere between 12-20% just before earnings collapsed heading into recession and caused leverage to spike, even in the absence of any further debt growth. Compare to where we are today on that scale – the five year growth rate currently sits at +4%, suggesting little in the way of overly optimistic growth assumptions. Somewhat counter to intuition, the poor earnings growth so far in this cycle may have contributed to its unusual longevity. It just happens to be a slower kind of cycle.

Figure 1: Growth of leveraged finance debt, as a multiple of starting size



Source: BofA Merrill Lynch Global Research

Figure 2: S&P500 EPS growth, YOY pct change



EPS growth peaked at 68% in Sept 2010 and 45% in March 1995
Source: Bloomberg, BofA Merrill Lynch Global Research

This brings us to debt leverage in our market, an indicator that is frequently used to make an argument for why this credit cycle is already overextended. While the headline numbers do in fact show elevated leverage in credit, a more nuanced analysis of its components suggests that certain special factors are skewing those headline figures. We have just described one of them – even at a somewhat slower than normal debt accumulation pace, leverage has picked up as a result of earnings growing substantially below normal cyclical peak levels.

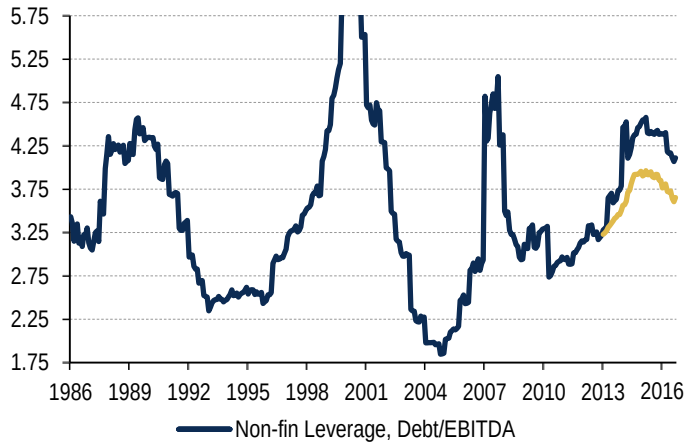
Additionally, deep losses in the energy and commodity sectors have made an outsized impact on overall market aggregates. Consider the following datapoint: at the trough of energy cycle in Q1 2016, overall US HY market L12mo EBITDA stood at $158bn, whereas ex-energy total stood at $200bn. Couple this fact with energy debt being the single largest contributor to the numerator of leverage calculation, and it makes it quite clear that the headline numbers were significantly impacted.

Such an impact is less pronounced today, but it still exists. Figure 3 shows a broader US nonfinancial corporate leverage metric, derived from the Fed's Flow of Funds data on earnings and combined with our own measures of US non-financial debt in both bonds and loans. We use an assumption to arrive at the yellow line on this graph representing ex-energy leverage, where we calculate overall US non-financial corporate earnings

[1] Here and elsewhere in all our work, we refer do the developed market USD-denominated markets, unless stated otherwise.

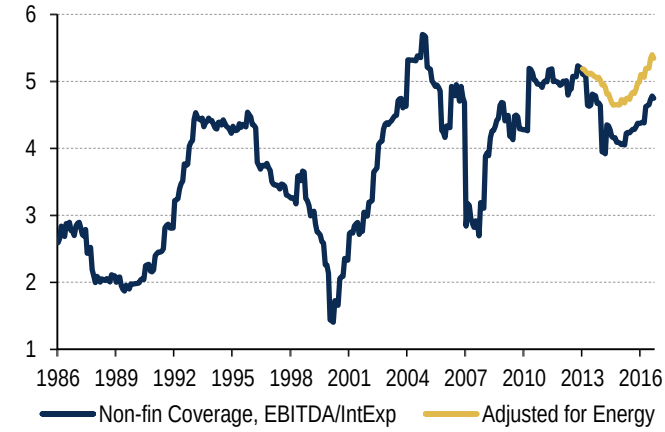
excluding the impact of energy losses. The resulting dataset, which is adjusted for Energy, suggests that overall US corporate leverage could be closer to cyclical averages, rather than peak levels. We also use the same earnings data to estimate overall US non-financial coverage ratio, which is shown in Figure 4 and remains comfortably close to its cyclical peak levels, reflecting continued support from low interest rates.

Figure 3: US nonfinancial corporate leverage (IG/HY/loans)



Leverage peaked at 9.4x in Feb 2001.
Source: Federal Reserve, Bloomberg, BofA Merrill Lynch Global Research

Figure 4: US nonfinancial corporate interest coverage (IG/HY/loans)



Source: Federal Reserve, Bloomberg, BofA Merrill Lynch Global Research

There is also an argument to be made that leverage has crept disproportionately into the higher-quality segments of US corporate credit during this credit cycle, as evidenced by US IG ex-energy total leverage numbers sitting at their cyclical highs, whereas equivalent US HY figures are about 1x away from their respective peaks. Elevated HY leverage implies higher chances of a potential default, whereas elevated IG leverage, in many cases, implies higher chance of a rating downgrade. The resulting portfolio impact is going to be quite different in those two scenarios.

And as a last word on the topic of leverage, we need to acknowledge that corporate debt issuance in recent years was primarily driven by multinationals trying to offset their overseas cash holdings and waiting for eventual repatriation with funds raised domestically. The presence of this factor is particularly pronounced in IG, but it has also made an impact on some HY sectors with greater overseas revenue exposures. Its impact is well demonstrated by comparing IG gross and net leverage numbers, which currently stand 0.7x apart, with the latter also being 0.5x inside of its previous cyclical peaks.

We are not trying to over-rationalize elevated debt leverage metrics. At the end of the day, leverage is leverage and it remains perhaps the single best indicator of credit risk. What we are trying to do is to highlight special factors that may have had a disproportionate impact on this indicator (i.e. energy, slow earnings growth), and describe where debt leverage has gravitated in this cycle (away from HY and towards IG). With this knowledge at hand, we do believe that the headline leverage numbers could lead investors to overestimating probability of a cyclical turn in the near-term.

Introducing our default rate model

Now that we have laid out our general thinking about this credit cycle, it is time to turn to the details. Those readers who are less interested in peculiarities of our model construction can safely skip to the next section where we discuss its current signal for next-year default rates as well as some practical implications of that forecast.

As we think about different default forecasting techniques we have come across over the years, a couple of challenges seem to be particularly persistent. One is the choice of independent and leading indicators. As we have described earlier, oftentimes models are based on variables that are derived from credit market valuations, which are in turn dependent on what expected credit losses are going to be, thus making results questionable in terms of real incremental value they provide. Similarly, economic indicators are generally correlated to credit losses but have not demonstrated sustained leading relationships over them in the past.

Another challenge is timing. Even if we identified a set of indicators that are both leading and independent, any given one of them could have a different degree of a leading relationship to expected credit losses. Some may do a better job in immediate near-term, whereas others could be better off when applied over longer time horizons. To address this particular issue, we have split our default forecasting model into effectively four independent models, each representing three-month intervals over the coming year (0-3 months, 3-6 months, etc.). Such an approach opens the door to choosing indicators that we believe are best suited to model expected credit losses with much greater time precision than simply forcing all of them to do so in the standard next-12mo approach.

Model methodology

Based on our backtested analysis, indicators that we identified to have the strongest leading relationships over the first three months are realized defaults over the *previous* three months, medium-term equity volatility (average VIX over the past six months, as a ratio of its 10yr average), and medium-term fund flows (24mo average pct of assets, in both HY and loans). Effectively, the next three-month default rate is all but determined by events that are unlikely to be able to change their course over a very short life of such a forecast.

This and other regressions in our model use as-reported factor values known at the time of observation. For example, an observation performed on Sept 30, 2016 would have used the following factor inputs: defaults from July to Sept 2016, VIX from March to Sept 2016, and flows from Sept 2014 – Sept 2016 stacked against issuer default rate between Oct and Dec 2016. Built this way, our model never requires any estimates or judgments on factor values themselves; it always uses only their actual known values. According to our backtested data, this particular regression would have had an 80% r^2 and t-stats of +6x (last 3mo defaults), +16x (medium-term vol), and -12x (flows).

Moving on to the 3-6 month horizon, the US Treasury 10/2yr yield curve comes in as a new predictor variable, calculated as a 4yr trailing average value. It contributed to the other two factors from the previous step, namely equity vol (1mo average/10yr average) and flows (18mo trailing pct of assets) to generate a 75% r^2 and t-stats of +14x, -5.3x, and -15x respectively.

In the next step, we found the Fed's Senior Loan Officer Survey (SLOS) and a measure of total corporate debt growth (overall corporate credit debt growth over the past 12mo as a ratio of last 5yrs) to have the best fits against subsequent 6-9 month default rates according to our backtested analysis. The r^2 in our backtest was 57% and t-stats were +18x and +4.1x respectively. It is notable to see how relatively short-term and narrow indicators such as equity vol and flows are being replaced by longer-term factors such market accessibility (SLOS) and over-indebtedness. In other words, longer-term default pressures appear to have less to do with ebbs and flows of capital markets and more to

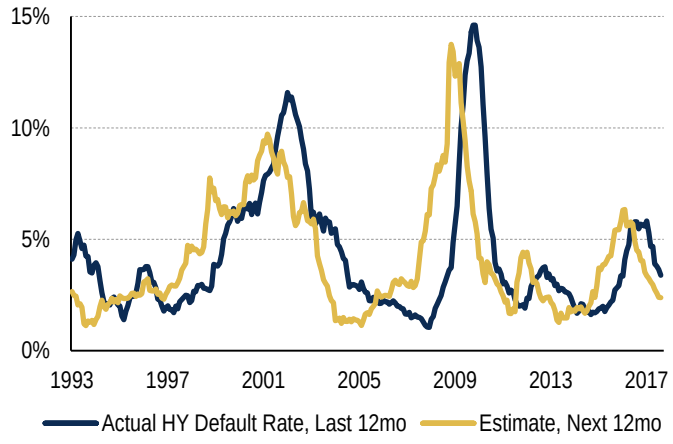
do with their fundamental and behavioral attributes. Conceptually, this subtle and yet important shift makes perfect sense to us.

And finally, the last leg of this model targets the 9-12mo time horizon, where we were able to achieve a 50% r^2 with the help of three factors: long-term low quality (CCC) issuance (4yr trailing, bonds and loans, pct of market size), SLOS, and a measure of aggregate cross-asset implied vol in equities, rates, FX, and credit. Each volatility measure is rescaled on a 0-100pt range based on its percentile ranking score, and then averaged over the trailing 9-months. The final value is calculated as a simple average of these rescaled inputs. According to our backtested analysis, these variables would have produced decent t-stats of +6.1x, +4.8x, and +5.1x. We find it natural to see the r-squared falling as the time horizon is extended further into the future.

With the four time-horizons modelled independently, we then transform those default rates into expected issuer default count in each three-month period, aggregate it up to next 12mo (N12mo), and arrive at our 1yr out default rate forecast. According to our backtested analysis, the r^2 of the combined N12mo estimate against the actual last 12mo default rate lagged by 1yr would have been 84% (Figure 5 shows the two rates, prior to applying any lags).

Figure 5: US HY issuer default rate, actual vs hypothetical backtested model estimate

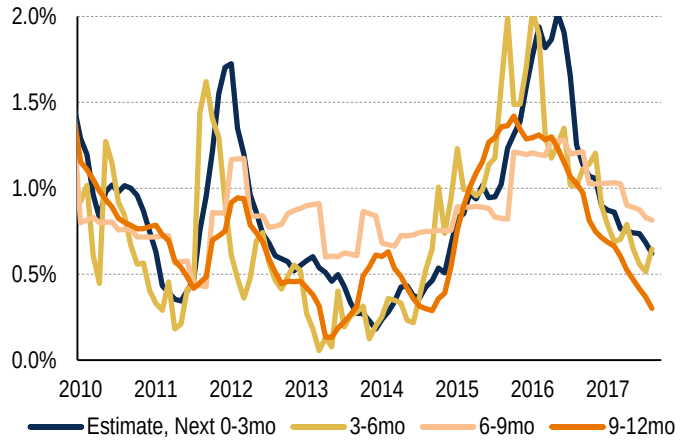
Actual = Moody's issuer US HY default rate; Estimate = back-tested model output



Back-testing is hypothetical in nature and reflects application of the model prior to its introduction. It is not actual performance and it is not intended to be indicative of future performance.
Source: Moody's, BofA Merrill Lynch Global Research, Moody's

Figure 6: Hypothetical backtested model estimates of default rates by forecasting horizon

Back-tested model estimates shown for this credit cycle only



Back-testing is hypothetical in nature and reflects application of the model prior to its introduction. It is not actual performance and it is not intended to be indicative of future performance.
Source: BofA Merrill Lynch Global Research

The model is new and the back-tested performance presented is hypothetical in nature and reflects application of the model prior to its inception date as if the model had been in existence at that time. It is not intended to be an indicative of actual or future performance. The actual performance of the model may vary significantly from the back-tested performance. The back-tested performance results are based on criteria applied retroactively with the benefit of hindsight and knowledge of factors that may have positively affected its performance, and cannot account for all financial risks that may affect the performance of the model going forward.

A word on factors that had a potential to be included in the model but did not make a cut. All of them were excluded for the same reason: their incremental contribution to the model was negligible in the context of the presence of other variables. This does not render a judgment on their value as a standalone factor reflecting credit conditions. Instead, we came to a conclusion that their presence did not provide any material improvement to the model. For example, different variations of leverage were attempted and all were eventually excluded because of low t-stats with the exception of

one where we used N12mo earnings in the denominator. Again, we did not want to end up with a model where additional estimates and judgments were needed to arrive at factor values themselves.

Other potential variables—such as the highest quality credit spreads (AAs) and a measure of HY market dispersion—were excluded because of their proximity to being a derivative of HY market pricing. Our goal here was to exclude any factors with even a remote potential for being compromised by such a link. Finally, a financial equity indicator (a measure of bank stocks' performance relative to S&P500) was excluded from this particular model but it transitioned to its next stage, where we estimate the appropriate level of HY liquidity premiums given our default estimate and other factors that we found to be useful in addressing that question.

In closing, a few words on the model's technical specification and construction. Formally, it attempts to estimate Moody's US HY issuer-weighted default rate series. It is built based on monthly data for all factor inputs and default rates going back to January 1993. The choice of period was constrained by availability of historical fund flow data, one the key factors. All input factors are available throughout the full observation period. The quarterly frequency of Fed's SLOS dataset was transformed into monthly by assuming unchanged values in between actual reported dates.

The choice of four forecasting time horizons was driven by appreciation of various degrees of a lead/lag relationship that independent factors might have against defaults. Most other models we have come across over the years have forced their inputs to forecast the next 12-month time horizon. Such an approach limits the choice of factors because certain indicators are just not durable enough in their impact to have meaningful explanatory power over full one year horizon. The approach presented here addresses this shortcoming, in our opinion. Each modified version of any given variable was chosen based on the best-fit criteria within the context of each regression. For example, a 6-month average VIX as a ratio of 10yr average VIX was chosen out of the sample of multiple combinations of VIX ratios and has happened to produce the strongest t-stat of +16x. All variables, without any exception, were chosen or rejected based on this criteria alone.

Once independent default rate estimates are produced over each subsequent 3-month time horizon, default counts are calculated as a product of default rates times universe size. We then aggregate expected default counts to the next 12-month horizon and calculate default rate as a ratio of default count to universe size.

The standard deviation of actual next-12mo rate versus modelled next-12mo default rates in our hypothetical backtested analysis is 1.2% within the context of 4.3% average HY issuer default rate and 3.0% standard deviation. Twelve months ago, the actual HY default rate, according to Moody's, stood at 5.9% and the model would have estimated this figure to come down to 3.2%, or 0.1% below actual default rate as of Sept 2017 (the latest observation available).

The error of model estimate was the highest in these two instances: early 2002 (10% model estimate vs 11.6% actual) and late 2007 (3.0% model estimate vs 1.1% actual). Readers might recall that these dates correspond to the peak and the trough of default rates in the past credit cycle, so the model on a hypothetical backtested basis would have estimated somewhat lower peak in 2002 and somewhat higher trough in 2007 compared to actual realized values. We would expect the model to remain susceptible to producing similar errors going forward, i.e. potential to underestimate peaks and overestimate troughs.

Risks to the model

Because our model relies on early indicators of credit stress that have worked in the past 24 years of its back-tested period, there remains a risk of it failing to properly react to new developments that might happen in the future. For example, sources of

volatility could be different in the next downturn than those captured by our model (equities, rates, FX, oil, and credit), or tightening in lending standards could come not from banks regulated by the Fed, but from non-bank lenders that are not subject to the lending conditions survey the model employs.

Our default rate forecast

Now that we have the theory out of the way, it is time to discuss the model's current signal. It suggests that defaults are probably going lower, from 3.4% actual level for the last 12mo (Moody's US issuer-weighted) to 2.3% in a year from now. On the surface, key drivers of a lower default forecast are: extremely low levels of volatility (the VIX is flirting with all-time lows, as is Treasury vol and FX vol and credit vol), market accessibility is high (SLOS shows lending standards remain loose), and new money continues to come into credit markets in search for yield.

A more interesting question is, perhaps, why these indicators are where they are and how long this environment could persist. Arguably, global central bank policies have a lot do to with this, and those policies remain very accommodative to this day. And while the Fed is in the process of normalizing its policy by raising rates and reducing the size of its balance sheet, the process remains painfully slow. To witness, in the last cycle, the Fed raised interest rates 16 times in 25bps increments over a two year-horizon between mid-2004 and mid-2006. We are now approaching the second anniversary of the first rate hike in this cycle (Dec 2015) and we have only had four hikes so far.

The pace of balance sheet reduction paints a similar picture of this potentially long and drawn-out process. The Fed has announced $10bn/mo in balance sheet run-offs that currently stands at $4.5tn and has grown from $900bn in 2007. Of course $10bn is just the first step and the pace is likely to increase over time, but even at $50bn/mo it would take them six years to fully normalize the balance sheet.

And that's just the Fed, who arguably is well ahead of the curve compared to its other DM counterparts. The ECB is still actively purchasing about €60-70bn/mo, and while it is contemplating a taper in coming months, in all probability it is going to continue buying more than the Fed is selling for months to come. And then there is the BOJ, which continues to buy roughly $20bn/mo without having guided the markets on any plans to taper those purchases. So net-net, the global QE will still be contributing more to the liquidity pool for some time to come, and with inflation indicators remaining soft in all these major economies, it is hard to see how these central banks are going to wean themselves off the very message of achieving the illusory 2% target they have defended for so long. The combined balance sheet of the Fed, ECB and BOJ is $14trln today, a $10trln increase from the pre-crisis level, and continuing to grow even with the Fed compressing its balance sheet.

So what is the conclusion here? We tend to agree with the model estimate, directionally and in terms of magnitude, as we think conditions are in place to see credit markets remaining very accommodative for some time to come. Some of these measures, like vol and market access, are as supportive today as they have been in 2006-2007 or 2013-2014. In both of those instances we have seen HY issuer-weighted default rates going into sub-2% zone, and we do not see immediate reasons that this time would be different. A 2.3% type of number sounds quite plausible to us.

It is true that not all factors in our default rate model are in the "perfect" shape to support lower defaults. For example, we have already discussed debt accumulation, which, while somewhat below previous cycles, is still meaningful. Similarly, the yield curve is not at its steepest levels here with 10yr treasuries yielding just 86bps more than the 2yr portion of the curve. Our take on these is that conditions do not have to be all perfect for defaults to reach cyclical lows. The yield curve was flatter in 2006 than it is today, and debt accumulation was higher (and its quality lower) than presently. And

yet such negative readings on some indicators were counter-balanced by extremely supportive levels on others, helping credit conditions remain very benign. We believe similar conditions exist today.

One final point on this is coming from Figure 6, where we show our component default rate estimates on each of the three-month horizons. What we find notable here is that all four components are showing improvements from their current levels, i.e. the model forecasts defaults to remain under pressure over each independent time horizon. And in particular, the 9-12mo default rate estimate, the longest among the four, is showing the greatest degree of improvement from here. By its nature, this component is the most forward looking and thus provides us with a glimpse (albeit a blurry one given only the 50% r-squared) of things to come beyond the model's time horizon. It is comforting to see this factor providing incremental support to our view.

How it ends?

Our observations and model estimates so far have painted a relatively benign picture, suggesting that defaults could remain low for some time. Having adopted this as the base case, we now turn to discussion of factors that could potentially derail it and prove us wrong.

All cycles before this one have ended with a surprise event, a "black swan" of sorts, which, by definition, was unexpected by the consensus and meaningful in its impact. This one is probably not going to be unique in this respect. And while forecasting the exact event is a futile exercise, we can still think about the general set of circumstances that could potentially turn this credit cycle.

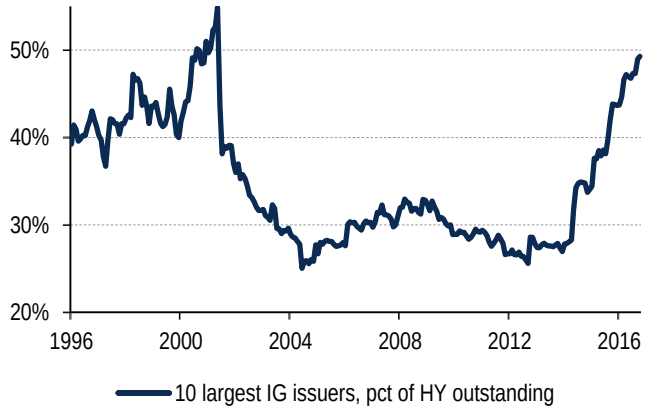
Broadly speaking we envision three kinds of developments that could play such a role:

1. **Inflation returns.** If low inflation and loose central bank policies have played a critical role in helping the markets get to this stage, it would be natural to expect them to play a certain role in reversing this move. At any given level of inflation, major central banks have proved time and again that they are more dovish than consensus expects them to be, and there are few signs to suggest that their behavior is about to change. With that it seems that only a genuine inflation surprise would wake them up and cause the kind of correlated policy tightening that few people currently expect to take place. So far, decent economic growth numbers in the US, Europe, and Asia have failed to spark any measurable inflation pressures. However, we are watching certain economic indicators closely, such as PMIs or Korean and Japanese exports (all at cyclical highs), which could prove to be early signs of an overheating. In the long run, we believe inflation will remain secularly squeezed by technology, but a temporary rise cannot be ruled out.

2. **Distress in isolated sectors spreads**. We have seen an example of this most recently in energy and commodities, where a 25% default wave nearly pushed the broad HY market into a full-blown default cycle. At the moment, there are few reasons to expect something like that to play out in the next year, with all known problematic segments, such as retail, wireline telecoms, and selected healthcare providers, representing tiny shares of the market (cumulative distress ratio is under 5% today). Again, we see few immediate reasons to believe that these known problems in narrow industries would spread elsewhere, but it's usually helpful to think about broader vulnerabilities if things develop in some unexpected fashion. To that end, if we expanded the range of problematic sectors to broad retail, healthcare, wireline telecoms, and also brought energy/mining back into the fold, their combined size grows to 30% of the total HY market. An additional layer of risk is being created by extreme concentration of large IG issuers, where the top ten non-financial capital structures today represent 50% of the total size of the HY market, the second-highest on record except for 2002 (Figure 7). A fallen angel of that magnitude would create a meaningful disruption on transition.

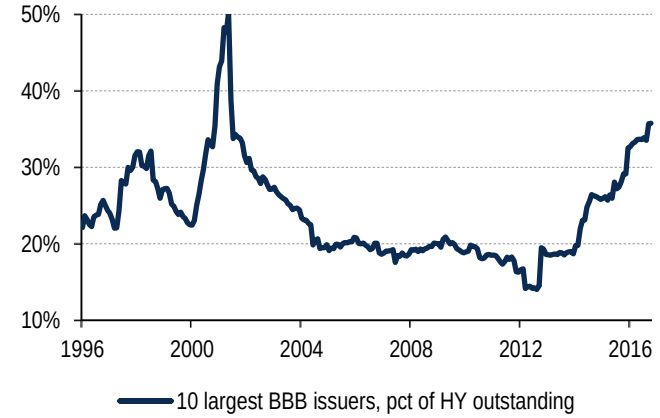
3. **Geopolitics cause a trade contraction.** The long list of unresolved global conflicts here is well known and does not require a recital here. Suffice to say that a flare up in any one of them could easily awaken the markets from their QE-induced hypnosis. And even outside the worst-case scenarios of an open military engagement, things could develop in a way such that the global economy suffers a shock. Consider the fact that S Korea is the single-largest source of Chinese imports, followed by the US and Japan. The same trio also appears on the other side of this trade superhighway, only as the largest destinations of Chinese exports. It is probably fair to say that some major global supply chains depend critically on these lanes staying wide open and unencumbered. One could draw a dotted line between where we are and a sharp contraction in this epicenter of global trade even if the world avoids the worst-case scenario on the Korean peninsula.

Figure 7: Top 10 non-financial IG issuers, pct of HY market size



Source: BofA Merrill Lynch Global Research

Figure 8: Top 10 non-financial BBB issuers, pct of HY market size



Source: BofA Merrill Lynch Global Research

Credit pulse

Over the last 3 ½ months we have seen a cumulative $87.25bn in DM HY issuance, $70bn of which has been USD-denominated. Of the new supply, 34% ($29.3bn) was BB-rated, 50% ($43.9bn) was B-rated, and the remaining 16% ($14.0bn) was CCC or NR. This is in line with the longer term new issue distribution of 36% BB, 49% B, and 16% CCC. As shown in Figure 10 below, average clearing yields have reached cyclical lows in both BBs and Bs, with average yield prints of 4.65% and 6.30% respectively MTD. Although the average CCC clearing yield has increased from 7.46% in September to 8.75% through October 5th, this is likely due to a small sample count with just one CCC deal coming to market so far this month. Specifically, West Corporation issued a $1.15bn tranche of eight year CCC+ paper, the 4th largest CCC-deal year to date. Although the deal printed with an 8.75% yield, this was at the tight end of talk in the 8.75% to 9% context. Additionally, the deal priced 157bps inside of the 10.32% yield where secondary CCCs currently trade.

Outside of the CCC space, Energy Transfer Equity LP notably launched a $1bn offering of BB- rated 5 ½ year secured bullet notes. This represents the tightest yield print since 2015 for US new issues totaling more than $1bn notional. Despite the low coupon, the deal was received well with the issue size increasing from $750mn and the yield printing on top of talk in the 4.25% area.

Over the last several months we have seen migration rates steadily improve across the HY space. Figure 12 below shows the net number of rating notches HY issuers have been upgraded on a trailing 3 month basis as a percent of market size. As indicated by September's positive figure, upgrades are now outnumbering downgrades—53 vs 34 over the last 3 months— for the first time since February 2015. Additionally, default rates have continued to decline with just 3 US HY defaults during August and September. That being said, we have seen one additional default so far during October after Appvion Inc filed for bankruptcy on October 1st. The company's 2nd lien bonds are currently trading at a dollar price of 45pts, down from 55pts at the end of September.

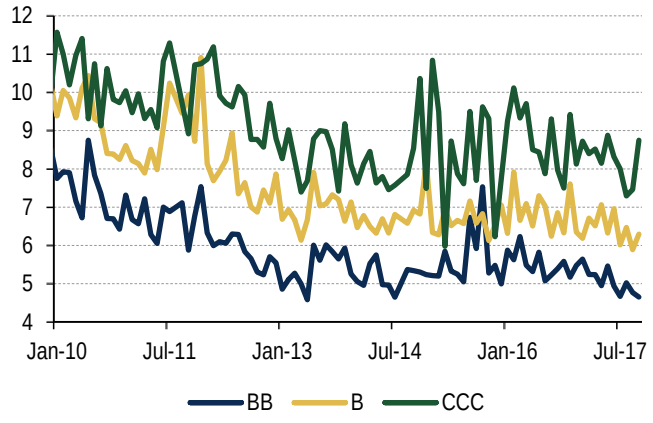
Figure 9: DM HY issuance, US$bn

	DM	US	Europe	BB	B	CCC/NR
WTD Oct 06	8.3	7.8	0.5	3.5	3.7	1.2
Wk Sep 29	7.6	6.1	0.6	0.8	5.6	1.3
Wk Sep 22	10.7	7.3	1.3	2.2	5.8	2.7
Wk Sep 15	14.2	10.5	3.8	6.0	6.7	1.6
MTD Oct	8.3	7.8	0.5	3.5	3.7	1.2
September	41.9	31.8	7.0	15.4	20.9	5.5
August	19.8	16.2	2.3	5.2	12.8	1.9
July	17.3	8.7	8.6	5.3	6.6	5.4
YTD 2017	259.1	184.3	54.7	101.3	117.3	40.5
YTD 2016	212.7	156.2	48.5	93.4	97.5	21.8
2016	265.7	194.7	57.4	107.9	128.8	29.0
2015	308.7	215.8	75.2	117.9	152.2	38.5
2014	376.0	238.8	119.5	129.9	186.8	59.2

Source: BofA Merrill Lynch Global Research

Figure 10: Average monthly HY new issue yields by rating bucket, pct

Each monthly yield based on simple average for all new issues within rating bucket



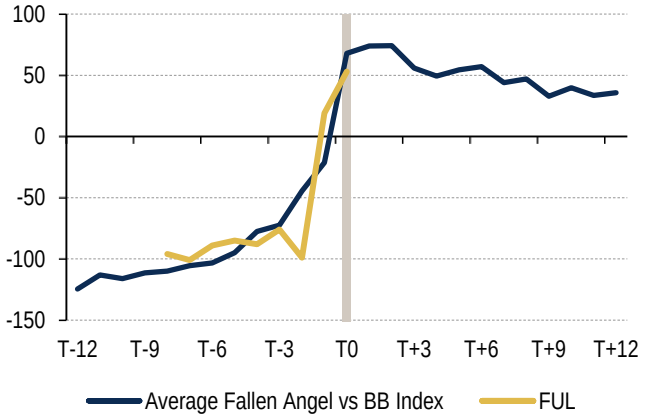
Source: BofA Merrill Lynch Global Research

Although credit conditions have remained supportive for most issuers, we recently experienced one fallen angel after HB Fuller Co (FUL) was downgraded to B2 from Baa3 by Moody's while S&P lowered its credit rating on the issuer to BB+ from BBB-. This reduces FUL's composite rating to B+, causing them to fall into our HY index H0A0 at the next rebalancing on October 31st. The ratings actions came after the chemical company announced a proposed debt offering related to its acquisition of Royal

Adhesives & Sealants for $1.575bn, or 11.4x LTM May 2017 EBITDA of $138mn. Pro forma for the acquisition, our research analysts expect FUL's adjusted EBITDA to increase from $281.1mn to $422.7mn, with adjusted EBITDA margin rising to 14.7% from 12.8%. However, the company intends to issue a $1.85bn term loan and $300mn in unsecured notes to fund the acquisition, causing pro forma LTM leverage to rise from 2.4x to 5.6x according to our analysts.

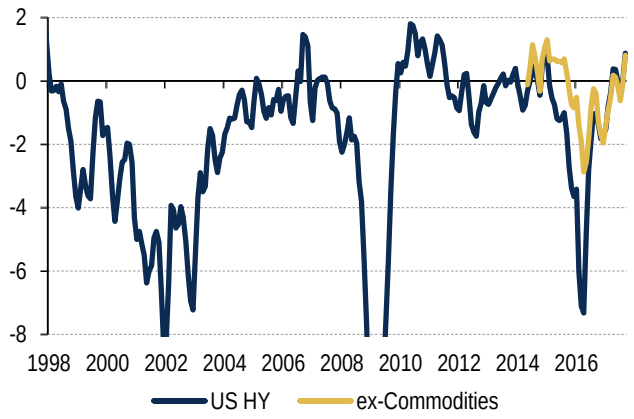
As shown in Figure 11, FUL was trading roughly 100bps inside of all BBs 6 months prior to the downgrade. Over the last 3 months however, the issuer has widened considerably and currently trades 53bps wide to BB spreads. This pattern mirrors the typical path for fallen angels, which tend to get oversold prior to being downgraded before subsequently regaining some of the lost ground. However, because FUL was downgraded all the way to a B+ composite rating, we would not be surprised to see their performance diverge from typical fallen angels and continue to widen relative to BBs from today's levels. For comparison, FUL currently trades 90bps tight to all Bs compared to 245bps just 2 months ago.

Figure 11: Average fallen angel OAS vs BBs around index transition
X-axis: months before/after downgrade into HY index



Source: BofA Merrill Lynch Global Research

Figure 12: Trailing 3 month migration rate, percent of issuers
Y-axis: Last 3 month net upgrades, pct of market size



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