Forecasting Credit Cycles:
The Case of the Leveraged Finance Market in 2024 and Outlook

By Edward I. Altman*

There are certain times in our economic and financial environment when it makes sense to assess carefully and dispassionately where we are in the credit cycle and how this cycle relates to the business cycle. Now, in mid-2024, is one of those times, as the economic uncertainties are at substantial levels. This note reflects my long history of studying credit cycles going back to the early 1970s. My current assessment is that the Benign Credit Cycle we have enjoyed since 2010, with the exception of a few months in 2016 and early 2020, ended in 2023. We recently reached an inflection point to an Average credit risk scenario. This assessment is based on an analysis of a number of historical indicators over the last 50 years. This conclusion is tempered by the possibility that the U.S. credit picture will continue its heightened risk trend toward a Stressed Scenario by the end of 2024, and combined with a “hard-landing” economic recession, we could witness another financial-credit crisis.

Key Words: Credit Cycles, Leveraged Finance, Default Rates, Business Cycles, Credit Crises

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Introduction

The “economic business cycles” concept is well known and most academics and practitioners understand the relevant topics and statistics dealing with economic expansions, slow-downs, recessions, and even depressions. But, when one mentions the “credit cycle,” the exact definition and relevant statistics are not clear and there is a relatively paucity of articles and books about the subject. Hence, one of the objectives and contributions of this paper is to clearly define and discuss the credit cycle and where we are today in its presence, mainly with respect to statistical data and also the associations with the business cycle in the United States. One caveat to remember is that these data criteria are personal choices and not necessarily universally applied.

Think of the credit cycle as a spectrum of credit market activity (see Figure 1). At one extreme, credit markets can be considered “benign” with low interest rates, much below average default and bankruptcy rates of firms and if there are defaults, the recovery rate for credit investors is relatively high and much above the historic average. Also, usually, the required return for new investors, particularly in risky-low-rated leveraged finance instruments, including distressed corporate debt, is below average. Finally, liquidity for new financing of these leveraged finance, low rated, non-investment grade firms, is ample even for the most risky borrowers, for example CCC-rate corporate bonds and leveraged loans (LL).

Figure 1

Credit Cycle Spectrum

	Benign	Average	Stressed	Crisis
Default Rate (HY):	0.0% → 2.5%	2.5% → 4.5%	4.5% → 8.0%	> 8.0%
Recovery Rate (HY):	> 50%	40% → 50%	30% → 40%	< 30%
OAS:	2.5% → 4.0%	4.0% → 6.0%	6.0% → 10.0%	> 10.0%

Measures

Default Rate

Recovery Rates

OAS

Distress Ratio (Not Shown)

Liquidity (Not Shown)

Source: E. Altman (NYU Stern)

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The next level in the credit cycle spectrum can be referenced as “average,” based on the same type of statistics indicated above, namely interest rate spreads over the risk-free rate, defaults and recoveries of existing firms and their outlook, required spreads of new investors, distressed ratios of debt volumes as a percentage of outstanding low rated bonds and bank loans, and market liquidity.

Figure 2 indicates the historic averages on these variables for the high-yield “junk” bond market (HY) going back 40 years. For example, the historic average default rate on

high-yield bonds , according to my calculation based on dollar amounts outstanding, is 3.3% per year and the weighted average default recovery rate is about 45% on high-yield bonds (measured just after default).

If the credit cycle deteriorates from average levels, the situation becomes “stressed,” with above average risk return required spreads, above average defaults and below average recovery rates and significantly reduced market liquidity measured by new issue volumes for at least 6-12 months of data.

Finally, the other-end extreme credit cycle environment involves a “credit crisis.” For me, that usually involves much above average yield spreads on risky debt, at least a 10% default rate for more than one year, a distressed ratio of firms whose yield spread is at least 10% above the risk-free rate for 15% or more of outstanding high-yield bonds, and paltry amounts of newly issued low-rated debt for at least 9-12 months.

With these references to the credit cycle’s spectrum, we can move to analyzing the current credit cycle. But before doing this, let’s observe and discuss some of the relevant literature on the credit cycle.

Literature Review (Academic Studies)

Over the last 30 years, there have been some economic and financial market literature on the credit cycle, but none, to my knowledge, deal with the full spectrum of the cycle, nor do they concentrate on the modern leveraged finance market. Several studies do

analyze the relationship between the credit cycle and the business cycle, and I will discuss these studies and concepts at the end of this literature review.

A number of studies focus on credit market booms and busts, including Schularick and Taylor (2012), Reinhart and Rogoff (2009 and 2011), Aikman and Nelson (2015), Castro and Martins (2019) and Castro, Cerqueira and Martins (2024). Some of these studies cite the 2009 Great Financial Crisis and how the credit system can be the source of economic shocks, indicating that “credit booms” should be monitored carefully and the dynamics of these booms understood, i.e., that exceptional credit growth and debt increases can be a strong predictor of finance crises. Castro and Martins (2019) discuss the political and institutional determinants of these credit booms and credit boom duration. Baron and Xiong (2017) emphasize credit expansions and crash risk.

Castro et. al. (2024) analyze the international structure of credit markets to determine if a single world event credit cycle exists. Using data from 48 countries from 1985 to 2015, they found three common factors that impact a large number of countries, especially developed ones. Despite not finding evidence of a single world credit cycle that governs the global market, they show that the interdependence of credit markets has been growing over time and highlights the need for coordinated international efforts to better manage credit growth and financial stability.

As noted above, a particular strand of past academic research concentrates on the relationship between the credit cycle and the business cycle—a subject that I will analyze in a unique way in a later section of this paper. Kiyotaki and Moore (1997) analyzed how credit constraints interact with economic activity over the business cycle,

showing that small, temporary shocks can lead to larger and persistent fluctuations in output and asset prices. The authors posit that when asset prices fall, borrower credit limits tighten, reducing their ability to invest, and this decrease in investment further depresses asset prices, creating a feedback loop that amplifies the initial shock. So, according to this research, preventing sharp declines in asset prices can maintain capacity and investment levels, thereby stabilizing economies and vice-versa.

Meller and Metiu (2017) and Kurowski and Rogowicz (2018) discuss the synchronization of credit cycles with economic cycles. These relationships are analyzed both within a particular country and externally, as well. De Resende, et. al. (2024), present a semi-structured neo-keynesian model of credit cycle and its application in a small, but important economy—Luxemburg.

Institute Working Papers

A few very recent working papers from established and respected institutions are also related to the credit cycle issue. The most relevant one is Ivashina (2024, NBER). This study finds that corporate debt does indeed explain boom-bust cycles, financial crises, and macroeconomic recoveries and is as predictive of these cycles as household debt. Another finding is that credit growth, flowing disproportionately into certain sectors like construction and non-bank financial intermediaries, is strongly associated with financial crises. Interestingly, the study also finds that recoveries from crises are slower after a boom in corporate debt, especially when that debt is backed by procyclical collateral values.

Boyarchenko & Elias (2024, NY Fed) analyze a large cross-section of equity and corporate bond returns and find that the global credit cycle impacts asset returns and the quantity of global credit. They find that tightening in global credit conditions predicts extreme capital flows episodes and declines in country-level private debt. The conclusion is that global corporate credit is a fundamental factor affecting local credit conditions and business cycles.

Finally, a Swiss Financial Institution's study by M. Andries, S. Ongena, and N. Spriceau (2024) finds that lending to households increases bank systemic risk, while credit extended to corporations tends to reduce systemic risk. The latter type of credit is associated with capital accumulation and productivity growth, which contributes positively to economic stability. However, lending to firms in tradable sectors, such as agriculture, manufacturing, mining, etc. reduces systemic risk, while lending to non-tradeable sectors, like real estate, construction, retail, etc., increases systemic risk, because these sectors rely on real estate-backed debt and are more vulnerable to demand shocks and financial constraints. Also, small banks are at higher systemic risk when lending to households than large banks due to smaller, less diversified portfolios and fewer government guarantees.

Credit Cycle Indicators

I base my assessment of the current credit cycle on analyzing the current economic and financial environment with five fairly transparent indicators, and their historical annual averages (or current levels), over the last 50+ years, including:

(1) *Default Rates*, both current and expected, in leveraged finance markets, primarily the High-Yield (HY) Bond and Leveraged Loan (LL) markets —– 3.3% average per year (1986 - 2023) for HY Bonds and 3.0% for leveraged loans (2007 - 2023), measured in dollars.

(2) The current and forecasted level of *Recovery Rates* when corporate obligations default —-45% of par value historically for fixed rate high-yield bonds and 60-65% for floating rate loans.

(3) *Required Rates of Return* by risky debt investors: based on risk premiums compared to yields on “risk-free” US Treasuries – the so-called OAS (option adjusted spread) yield spread —– 5.4% average annual.

(4) *The High-Yield Bond Market’s Distress Ratio*: The percent of HY bonds yielding at least 10% above the comparable duration Treasury Rate —– 8- 10% level, historically.

(5) *Market Liquidity* in the risky debt market, as measured by the recent amount of risky debt being issued and accepted by the market, including the most risky CCC new issuance —–– at least $250 billion annual issuance of HY Bonds and CCC issuance of 10-15% of total new HY bond issuance. Comparable issuance in the leveraged loan market.

While all of these indicators are fairly transparent and mostly forecastable, the one that is most difficult to measure, and certainly to forecast, is market liquidity; perhaps also the most important. The summary average annual statistics and those for 2023 for all five indicators, and a few others, can be found in Figure 2 and later in Figure 3, the comparable data as of H1 2024.

Figure 2

Credit Cycle Indicators and Outlook for 2024

Indicators	Historical Average (1971 – 2022)	December 31,2023 (Full-Year Results) and Outlook**
Default Rates – HY Bonds Forecast for 2024	3.3% ———	3.4% ($ Based); 4.0% (Issuer) 3.2% ———> 4.6% ($ Based)
Default Rates Leveraged loans Forecast for 2024	2.5% ———	3.5% ($ Based); 5.8% (Issuer) 3.4% ———> 6.0% ($ Based)
Recovery Rate - HY Bonds Forecast for 2024	45% ———	36.0% ($ Based); 39.0% (Issuer) 43% ———> 36% ($ Based)
Recovery Rate - Lev Loans Forecast for 2024	60-65% ———	50.0% ($ Based); 52.0% (Issuer) 55.0% ($ Based); 58% (Issuer)
Investor Required Rates of Return	5.4% (OAS) 5.3% (YTMS)	3.40% (OAS) 3.60% (YTMS)
High Yield Bond Distress Ratio (Percent of HY Bonds > 10% above T-Bond)	8-10%	5%
HY Bond Market Liquidity (New Issue Amount) CCC New Issue Percent	~$200-$250Bn (2015-2022) 12-15%	$175 Bn 5%
Default Rate Direct Lending (Shadow Banks)	———	2.3% (*) (Issuer)

Sources: E. Altman (NYU Stern); E. Rosenthal (KBRA); and Bankruptcy.com (New Generation Research)(*)

**The High-Yield Bond default rate for YTD 2024 as of 3/31/24 was 0.6% (8 Defaults) and the leverage loan default rate was 2.0% (25 Defaults).

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Where Are We Now?

My primary frame of reference is the U.S. HY Bond Market, one that I had the good fortune to study from almost its inception in the late 1970s when this market was nascent and mostly fallen angels, about $10 billion outstanding. At that time, some investment banks and institutional investors were considering underwriting and investing in this new, non-investment grade capital market that had been essentially

closed up to then to corporate issuers as an alternative source of financing. As is now well known, this High-Yield, or “junk bond”, market has grown from those early days to about $1.6 trillion outstanding today in the U.S. and about €600 billion in Europe, depending on who is measuring the market’s size, and the loan equivalent, leveraged loans, also about $1.5 trillion outstanding in the U.S. Finally, the nonbank, or shadow bank loan market, is over $1.5 trillion today in the U.S., and growing in most countries. The Chinese non-bank loan market (mainly Trusts) is the largest in the world, estimated at $3 trillion, but not growing currently as the real estate market for new financing is dormant.

One new indicator of corporate credit risk is the default rate compilation of the non-bank loan or private credit market as created and maintained by KBRA’s “Direct Lending Debt (DLD)” group as well as the Proskauer Private Credit Default Index. For DLD, The percentage of defaults (based on number of defaults, not dollars) of about 2,400 direct loans made by non-banks to primarily highly leveraged private-equity owned companies, provides the most comprehensive measure of this somewhat opaque market. In 2023, the estimated default rate was 2.3% (see bottom of Figure 2), less than one half of the issuer based 2023 default rates on LL reported by several of the rating agencies. At this time, there are little direct lending market default rates for years prior to 2023.

Where are we now in mid-2024 and how will the rest of the year shake out? The last few years’ annual default rates on HY Bonds were 0.5% in 2021, 1.3% in 2022 and

3.4% in 2023. More importantly, I expect the 2024 annual default rate level off to between 3.2% to 4.0%, depending upon if the U.S. and European economies incur a “soft” or “hard” landing, or no recession. As of June 30, 2024, the year-to-date high yield bond default rate was 1.0% ($ denominated) and 1.7% (Issuer), while the leveraged loan (floating rate) rates were 3.2% and 3.8%, respectively, see Figure 3. My forecast is based on three, equally weighted, factors that we consider, including (1) historical mortality rates (based on the Altman (1989) study’s actuarial methodology of bonds issued at various bond rating levels by S&P), (2) the current yield spread required by HY Bond investors, and (3) the current Distress Ratio. The latter two factors are market based regression results of point estimates of investor required yields and distress ratios regressed on subsequent one year default rates, while the first is based on the mortality statistics of more than 3,500 defaulted issues since 1971, see Altman (2018).

Figure 3

Default and Recovery Rate Statistics – H1 2024 (YTD)

Indicators	$.	Number
HY Bond Default	1.0%	1.7%
HY Bond Recovery	47%	49%
Lev Loan Default	3.2%	3.8%
Lev Loan recovery	61%	54%
Direct Lending Default	—	0.9%
Direct Lending Recovery	—	56%

Source: KBRA DLD Group

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Analyzed together, our forecast is a 2024 HY Bond Default Rate ($ based) of at just below or just above the historical average. This forecast is actually fairly conservative compared to that of most other forecasters.

The expected default rate for more interest-sensitive leveraged loans is considerably higher than for high-yield bonds and, as such, has a lower correlation to the historical experience since 2005 (0.92 correlation). For 2024, the leveraged loan default rate could hit as high as 6.0%-7.0%!

Recovery Rates

We measure the weighted average Recovery Rate on Defaulted HY Bonds (bankruptcy, missed interest rate or maturity payments, or Distressed Exchanges) based on the market price just after or 30-days after the default date. This recovery rate was an above average 60% in 2022 when the default rate was a below average of 1.3%, but fell to 36% in 2023, indicating increased risk in 2023 and likely beyond. My forecast for 2024, if default rates remain about average, is an increase to close to the historical level of 45% for bonds and 60-65% for loans. As of mid-year 2024, the high-yield bond recovery rate was 47% ($ denominated) and 49% (Issuer), while the leveraged loan recovery rates were 61% and 54%, respectively (see Figure 3). Our forecast is based on regression results from Altman et. al. (2005), showing the historical association between default and recovery rates.

Required Yield Spreads

As of the end of H1 2024, the US HY Bond Market's (ICE Index) Option-Adjusted Yield Spread (OAS) was about 3.2% (Figure 3), far below the historical average level (5.4%), indicating the market's expectation of below-average credit risk. This unusually low measure was at first surprising to me, given several high-risk factors, including historically high corporate leverage levels, especially amongst highly leveraged companies, and an increasingly high level of maturities in 2024, and especially in 2025 in most industrial sectors ("Waterfall analysis") and an uncertain level of GDP, inflation, interest rates and corporate profit outlook. No doubt, this very low risk premium level is primarily driven by the positive stock market performance of late, since HY Bonds and

LL correlate very highly with prices of common stocks, perhaps close to 80% correlation. In addition, there are several other reasons for the unusually low HY bond spread, including (1) competition from the growing size of the non-bank, private credit market, (2) high absolute yields available due to high relative interest rates and (3) ample funds for investment by HY and LL mutual funds and other leveraged finance investors.

Distress Ratio

The same factors that have determined the yield-spread statistics at the end of 2023 and into 2024 are driving the HY Distress Ratio percentage of about 5% as of H1, 2024. Recall that the historic average is almost double this percentage. Hence, another indicator of below average credit risk perception.

Liquidity

As noted earlier, an extremely important, but illusively forecastable, measure is the liquidity of the risky debt market. In 2023, $175 billion of new HY Bonds were issued (Bank of America estimate), which while about $75 billion below recent average year levels, did show a measurably high increase in the last quarter of 2023, and a continued robust level in early 2024 (already almost $185 billion in H1, 2024). This market is, however, extremely volatile, subject to dramatic shifts as conditions change, and especially when unexpected catalysts manifest, e.g. crypto crises or bank failures, like Silicon Valley Bank, et. cetera. This is especially true of the most risky CCC-rated market. The latter's new issuance is a rating class that I closely watch! And,

year-to-date as of mid-2024, the amount of new issue CCC bonds were a paltry $11 billion, only 6.7% of total high-yield new issue volume, about half of the historical amount. This relatively small amount is indicative of investors becoming more risk averse and diminishing liquidity. In addition, banks and probably non-bank lenders became more risk-averse in 2023, with tightened lending standards, mainly due to exceptionally high leveraged ratios of non-financial corporates and continued high interest rates.

Middle Market Growth

One positive indicator of corporate robust revenue and cash flow performance that is not well known, but we find increasingly important as a forecast of larger non-financial companies and GDP performance, is the U.S. Middle-Market firm trend. For this, I rely upon the *Golub Capital Altman Index* (2024) of year-over-year performance of a select number of analyzed mid-market firms. This index showed record positive year-over-year growth of sales and profits in Q3, and especially Q4, of 2023. And, very high growth rates of these performance variables continued through Q2 of 2024!

The 'wild-card' is the upcoming interest rate policy of the Federal Reserve, but it is looking likely that we will observe a relatively small decrease of interest rates in the short run in 2024. The likely reduction of interest rates by central banks in 2024 will be

mitigated, I believe, by the enormous amount of required new debt financing by governments as they try to finance their deficits and persistent inflationary pressures.

Conclusion on the Credit Cycle

My conclusion is that the US leveraged finance market, and probably the European market, incurred an “Average” credit cycle performance in 2023 and into H1, 2024, as several positives continued to manifest, offsetting the well published negatives of high inflation, elevated interest rates and a possible recession. These positives include still robust corporate revenue and cash flow growth, especially amongst firms able to pass along the escalating costs due to inflation to customers, a limited amount of bonds and loans that matured in 2023, and still high but declining inflation.

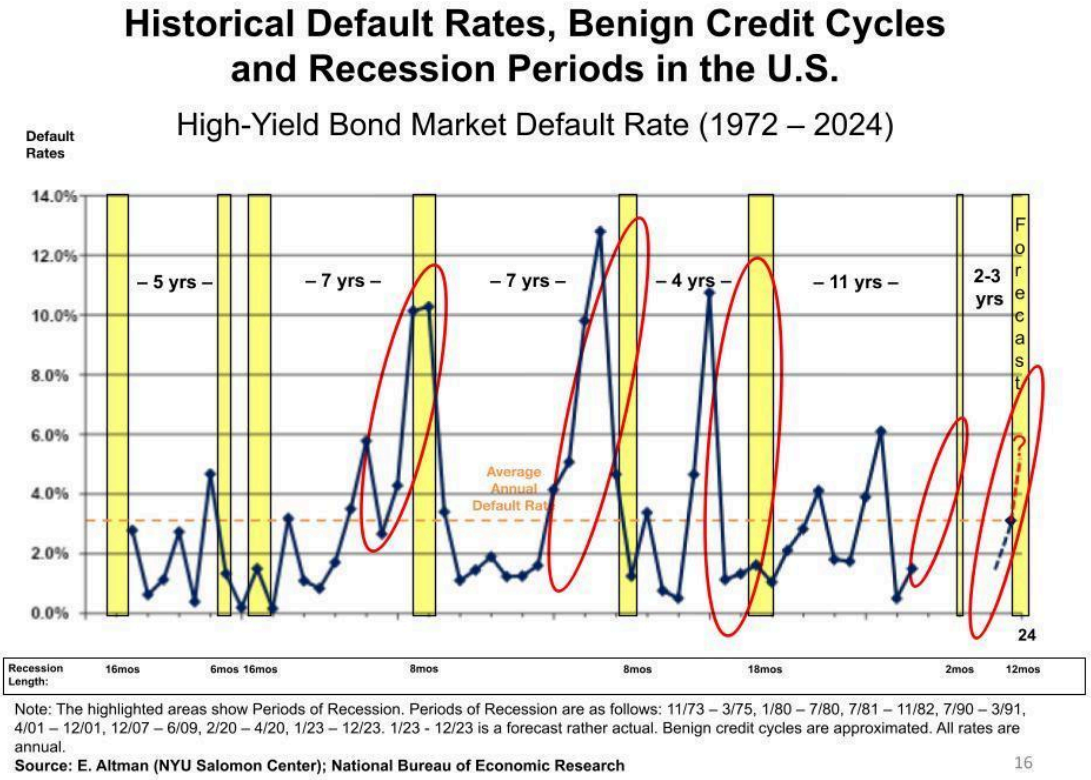
Our final lament is to ask if this is really an average credit cycle for much longer?

The Credit Cycle and the Business Cycle

Figure 4 below clearly indicates, to me anyway, that the time series relationship between HY Bond Default Rates and economic recessions is potentially important and surprising to many economists. It indicates that annual default rate trends (solid line) have been a leading indicator of recessions (bars) in every instance of the last three/four recessions in the U.S. (1990/91, 2001/02, 2008/09, but understandably less so in 2020, the short lived pandemic recession). In all cases, except 2020, Default Rates increased from a low, benign level to above average levels from one to three years *prior to* the onset of the recession, indicating that corporate distress can portent a

general economic malaise. The one hiccup in this association is the escalating trend in the U.S. in corporate defaults in 2016, caused by a temporary energy crisis and a number of related large company defaults, which was not followed by a general economic downturn.

Figure 4



Fast forward to the current situation, note that default rates were at an abnormally low level in 2021 (0.5%) due to the U.S. Government and Federal Reserve support of most enterprises, to 1.3% in 2022, and 3.4% in 2023. It should be noted again that most of the major rating agencies are forecasting an even higher than average HY Bond default Rate in 2024. If we do have a recession in 2024, and that recession resembles a “hard landing”, as some economists are still forecasting after the recent banking crisis and high inflation rates, the Default Rate and all of our other indicators could deteriorate to a

“stressed” level of near double digit default rates and extreme illiquidity conditions. So, is 2023/2024 really “average” when all is said and done? I have my doubts! As for the rest of 2024, my forecast of the credit cycle is likely not to be for an above average risk level as several indicators, e.g. default rates, required returns, distress ratios, and possibly liquidity, are at average or below average risk levels. Recovery rates are the only indicator at above average risk and the big unknown is liquidity, especially in H2 of 2024.

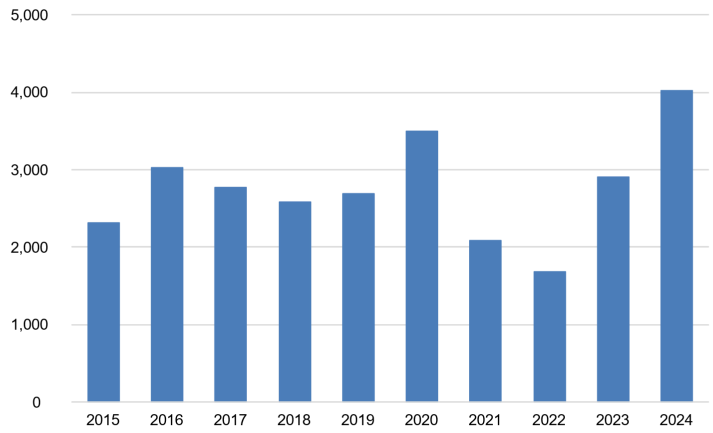
2024 - H1 - Year To Date Bankruptcies

In 2024, according to Bankruptcy.com, the trend of a growing number of corporate bankruptcies continued with 4,022 Chapter 11 filings in H1. This is a 39% increase over the comparable H1 in 2023 and a 46% increase over the number of H1 filings in the 10-year period 2015-2024, see Figure 5. The current year’s H1 volume of filings actually was greater than the number in 2020, the first and most dramatic year of the pandemic.

Figure 5

Chapter 11 Bankruptcies in 1st Half of the Year: 2015–2024

Year	H1 Count
2024	4,022
2023	2,901
2022	1,680
2021	2,079
2020	3,502
2019	2,693
2018	2,577
2017	2,771
2016	3,031
2015	2,313



Conclusion

- 2024 is a 39% increase over 2023
- 2024 is a 46% increase over the 2015–2024 average
- Highest H1 count in recent history including the GFC

Source: BankruptcyData.com

The latest corporate bankruptcy Chapter 11 filings increase mirrored the huge increase in leveraged loan defaults in H1-2024, which were 48 involving $47 billion in liabilities and 3.2% ($) and 3.8% (number) default rates in H1 (YTD)! If this trend of interest rate-sensitive company defaults continues for the rest of 2024, the annual default rate could rise to almost a pre-crisis level of 6-7%!

The dramatic increase in Chapter 11 filings in H1 2024 was amplified by a substantial rise in Subchapter V filings which are available to smaller companies with liabilities

equal to or less than $7.5 million. This version of Chapter 11 usually results in faster and less expensive reorganizations.

Interestingly, corporate High-Yield bond defaults in H1 2024 (YTD) was only $13 billion on just 15 defaults, for a 1.0% YTD default rate, while LL defaults were 48 and $47 billion (KBRA statistics).The difference between the huge leveraged loan default count and dollar volume default rate and that of High-Yield bonds is due to the fact that leveraged loans are mostly floating rate obligations, while HY bonds are mostly fixed rate. Most High-Yield bonds were issued at much lower interest rates than is currently the case for leveraged, non-investment grade debt.

The latest data (H1) on direct, private lending showed a 0.9% YTD default rate (DLD) and a last 12-month rate of 1.9% (DLD) and 2.7% (Proskauer).

In conclusion, the current YTD default scenario is sending a mixed message. The near term record level of bankruptcy reorganization filings and leveraged loan defaults is perhaps surprisingly high given the seemingly robust macro-economic environment. Hence, 2024 and its outook is anything but average!

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