Macroeconomic and Credit Analysis Predictability Performance

September 26, 2023   Seth D. Rosenthal, CFA

Summary

This paper investigates the predictability of default using macroeconomic factors and/or fundamental credit analysis in investment grade (IG) fixed income asset management. How much does each explain in understanding risk and increasing performance in security analysis? What we have found in published research, and have acknowledged in our own research, is that credit ratings and macro factors explain the majority of defaults in corporate debt. Additionally, macro factors are reliable in signaling periods of increased financial stress to corporate debt and increased defaults.

Key Takeaways

- For investment grade corporate debt, credit analysis has minimal value over what can be explained through macro factors
- Credit defaults happen in clusters during economic downturns
- Macro indicators can signal periods of increased credit stress
- Quantitative credit analysis paired with an overweight on macro credit factors are gaining traction with leading firms

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Scope of this paper

This paper evaluates the value of macroeconomic and fundamental credit analysis in understanding IG corporate credit performance. Specifically, this paper will investigate which practices add predictability in understanding corporate default rates and to what degree. Further, this paper will investigate what are the influential factors and what are the alternatives. This paper is only focused on US IG credit, and not high-yield or emerging market credit. Private credit analysis is also not included in the scope of this paper.

What existing research concludes

There is complete data on IG credit defaults from the three credit agencies, providing ripe opportunities to investigate how both macro and credit factors perform historically. In a joint NYU Stern and Moody's Credit Research study seeking to understand the influence of macroeconomic factors on corporate defaults, Stephen Figlewski et al. analyzed a broad range of macroeconomic variables with firm-specific factors, against all IG corporate defaults from 1981 to 2002. They found that "the intensity of occurrence of a credit event was strongly influenced by both macroeconomic and ratings-related factors."[1] This study further elaborated that there was "little deviation in credit events outside of macro and rating factors."[2] The findings of this study imply that rating data and macroeconomic factors explain most IG credit defaults. However, this study only analyzed data from an approximate 20-year time horizon and therefore could be highly sensitive to cyclic economic factors. Nevertheless, the findings of this study prompted more recent studies over longer time horizons.

In a related follow-on study, researchers from the National Bureau of Economic Research, Stanford, and the London Business School analyzed corporate defaults across a 150-year time horizon from 1866 to 2008. The findings supported the earlier study that macro factors had a huge impact on corporate defaults. This paper, Giesecke et al., confirmed that macro factors (while controlling for credit rating) are not only correlated but also remarkably have predictive power in default rates. Interestingly, this paper makes a new claim that credit spreads do not have much predictive power in credit default rates:

> Stock market returns and changes in stock market volatility have significant predictive power for [IG credit] default rates. Changes in Gross Domestic Product have predictable forecasting power in default rates. Other Macroeconomic variables such as inflation and growth rates of consumption and industrial production do not forecast future default rates. Credit spreads do not have much predictive power for default rates. Spreads are twice as wide as actual risk would warrant.[3]

This same study notably found that during periods of economic instability, corporate defaults happen in clusters. These periods of clustered defaults cannot be explained solely because of economic conditions. Rather, the default of one company causes momentum for more defaults to occur:

> A major source of default clustering is the joint exposure of firms to common or correlated risk factors such as interest rates, stock returns, and GDP growth. The movements of these factors cause correlated changes in firms' conditional default rates. For example, strong economic growth often reduces the likelihood of default across the board. In an important paper, however, Das, Duffe, Kapadia, and Saita (2007) provide strong evidence that this channel on its own cannot explain the degree of clustering observed in U.S. industrial defaults between 1979 and 2004. The evidence suggests that

[1] Figlewski et al., Modeling the Effect of Macroeconomic Factors on Corporate Default and Credit Rating Transitions.
[2] Figlewski et al., Modeling the Effect of Macroeconomic Factors on Corporate Default and Credit Rating Transitions.
[3] Giesecke et al., Corporate bond default risk : A 150-year perspective (1866-2008).

there are additional sources of default clustering beyond firms' joint exposure to systematic factors.[4]

The existence of *momentum in defaults* findings prompted a follow-on study, Azizpour et al. (2017), by a few of the same authors to understand the factors that influence clustered defaults during periods of systematic economic stress.[5] This follow-on study discovered two important findings. Firstly, default clusters are not correlated solely because their conditional default rates depend on observable and latent systematic factors. Rather *contagion,* the default by one firm directly impacting the health of other firms, is a significant source of corporate IG defaults during economic stress. Secondly, the study found that corporate default clustering that cannot be explained by contagion and firms' exposure to observable and latent systematic factors is [statistically] insignificant.[6] During periods of systemic economic stress, there is only statistical evidence for higher firm default rates in clusters because of systemic macroeconomic factors or contagion only. Said differently, only macroeconomic factors and contagion effects can explain which firms are going to default during periods of economic distress.

In another unrelated paper that also examines a large sample, an investigation of correlated variables in corporate default risk and default probability found that the most important predictors of default were a firm's leverage, trailing stock return to S&P 500, and US interest rates.[7] Default probabilities were found to depend on a firm's distance to default, the solvency of the firm (as expressed in the firm's market cap and stock price volatility), and their relationship to the firm's debt level. The objective of this study was to find the best variables using stochastic methods to maximize covariates, in other words to maximize the predictive power. The research did find some issues with using this method in predicting default; although the modeled distribution of default decreases closer to maturity, it does not accurately predict the associated insignificant default probabilities for maturities of roughly two years or less (at typical parameters), even for low-quality firms. This is where the researchers did conclude that structural models like Merton (1974)[8] apply a solvency test regarding whether the distance to default falls below some barrier, that is in some cases determined endogenously. However, despite the value of a Merton-style approach evaluating credit analysis for periods of two years or less, the conclusions again are that macroeconomic variables, not a structural credit risk model, are most predictive in default. What was different in this factorial approach used by the researchers was that it provided different information from Merton's structured approach, than what is already considered through rating agencies.

Given the preceding findings that macro factors are reliable in predicting credit defaults, and that defaults happen in clusters during periods of financial instability, it's useful to understand the relationship between macro factors and financial crises. In a recent study, Greenwood et al. (2021), researchers found evidence that macro factors can predict periods of financial stress:

> *The combination of rapid credit and asset price growth over the prior three years, whether in the nonfinancial business or the household sector, is associated with about a 40% probability of entering a financial crisis within the next three years. This compares*

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[4] Giesecke et al., Corporate bond default risk : A 150-year perspective (1866-2008).
[5] Azizpour et al., Exploring the Sources of Default Clustering.
[6] Azizpour et al., Exploring the Sources of Default Clustering.
[7] Duffie et al., Multi-period corporate default prediction with stochastic covariates.
[8] Merton, On The Pricing Of Corporate Debt: The Risk Structure Of Interest Rates.

with a roughly 7% probability in normal times, when neither credit nor asset price growth has been elevated. Our evidence cuts against the view that financial crises are unpredictable "bolts from the sky" and points toward the Kindleberger-Minsky view that crises are the byproduct of predictable, boom-bust credit cycles.[9]

In Academy's own research, we have found that macro factors are often more influential to investment performance than credit deterioration. Long-term analysis over a 150-year time horizon of IG corporate default rates found that even during economic distress, defaults rarely rise above 5%.[10] Recently, since 2001, the highest annual default rate for investment grade credits was 0.75% (2008). However, during that same year (2008), the 1-3 year corporate index was down 1.40% and the 1-10 year corporate index was down 7.14% as a result of the broader macroeconomic environment. In 2022, despite zero investment grade defaults, the 1-3 year corporate index was down 3.25%.

U.S. corporate default summary

Year	Total defaults*	Investment-grade defaults	Speculative-grade defaults	Default rate (%)	Investment-grade default rate (%)	Speculative-grade default rate (%)	Total debt defaulting (bil. $)
2001	172	6	133	4.55	0.34	10.55	100.91
2002	134	10	82	3.18	0.57	7.25	188.14
2003	89	0	65	2.32	0.00	5.60	42.68
2004	45	1	29	1.08	0.06	2.44	18.68
2005	33	1	26	0.95	0.06	2.02	42.04
2006	22	0	19	0.65	0.00	1.37	6.97
2007	18	0	15	0.50	0.00	1.02	7.02
2008	95	11	66	2.56	0.75	4.30	334.34
2009	195	5	166	6.01	0.35	11.81	516.08
2010	58	0	45	1.69	0.00	3.47	79.45
2011	39	1	30	1.12	0.07	2.16	74.30
2012	46	0	39	1.37	0.00	2.66	39.00
2013	45	0	34	1.16	0.00	2.19	64.85
2014	33	0	27	0.87	0.00	1.61	81.98
2015	66	0	52	1.58	0.00	2.86	85.90
2016	106	0	92	2.84	0.00	5.20	166.77
2017	64	0	54	1.69	0.00	3.08	70.70
2018	47	0	43	1.34	0.00	2.41	101.55
2019	78	2	59	1.83	0.14	3.10	147.88
2020	146	0	124	3.79	0.00	6.64	222.84
2021	40	0	29	0.89	0.00	1.54	52.68
2022	36	0	32	0.96	0.00	1.65	56.91

*Total defaults column includes companies that were no longer rated at the time of default. Sources: S&P Global Ratings Credit Research & Insights and S&P Global Market Intelligence's CreditPro®.

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[9] Greenwood et al., Predictable Financial Crises.
[10] SP Global Ratings.

Analysis

The research above focuses on defaults (as they are an easily measured, binary variable), but defaults are a proxy for performance, which is more difficult to measure. The most prominent takeaway is that macroeconomic factors have predictive power in understanding default risk and performance. However, several factors mentioned in the previous section add complexity and must be examined: corporate defaults happening in clusters, credit spreads relative to default risk, and default predictability.

Clustered defaults

The phenomenon of clustered defaults comes from interdependencies and contagion effects. As corporates default, other corporate credits default, not because of their credit quality, but rather due to market risk appetite. Changes in central bank policies, interest rate movements, or regulatory measures can influence the availability and cost of funding for issuers. As seen in the aforementioned studies, macro events create interdependencies that impact liquidity and funding conditions in the fixed-income market, causing or at least influencing contagion. These contagion effects are a primary contributor to defaults in cluster periods.

Credit Spreads

Credit spreads are wider than actual risk would warrant, suggesting that they have limited value in understanding default risk. During periods of economic uncertainty or market volatility, investors tend to become more risk-averse and demand higher yields to compensate for perceived credit risk. Conversely, investors may exhibit higher risk tolerance in times of economic stability and favorable market conditions, leading to lower spreads.

Default Predictability

Fundamental credit analysis, like Merton's structured credit default methods,[11] are certainly important and not outdated. However, there is limited value in running credit analysis over what has already been reflected in credit ratings. Industry dynamics, competitive position, and market trends are captured in nationally recognized statistical rating organizations (NRSROs) such as Moody's, S&P and Fitch Rating agencies. Credit ratings are certainly a tool in assessing risk. However, credit default probabilities calculated by NRSROs do not consider current market conditions and do not capture firm idiosyncratic risk and needs to be applied to understand default risk. Here, macro analysis is critical in predicting corporate default rates.

So why hasn't the importance of these factors above been more discussed? One answer might be because of the low volatility environment prevalent in US markets after the GFC. There have been paradigm shifts since 2019, and managers cannot manage credit portfolios the same way they had during the no-yield period; in periods of low volatility, there is little meaningful difference among managers. One research department has noted:

> *Over the past 20 years asset managers have been persistently overweight risky assets, inflating the returns of active fixed-income managers. After allowing for persistent*

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[11] Merton, On The Pricing of Corporate Debt: The Risk Structure Of Interest Rates.

exposure to credit and to other traditional risk premia, active fixed-income managers generate virtually no alpha. This result holds both for managers on average in each category and for individual managers. This would imply that during the past 20 years of active fixed-income management, credit risk has not resulted in alpha and rather outsized risk premia. [12]

Macro analysis is the most important differentiating process in understanding IG credits. Macro events, such as changes in interest rates, economic indicators, or geopolitical developments, can have a broad and systemic impact on the fixed-income market. These events can influence the overall credit environment, affecting multiple issuers or sectors simultaneously. As a result, they can explain more significant and immediate effects on fixed-income credit pricing and risk compared to individual credit analysis (which focuses on specific issuers). Market expectations and economic indicators, such as GDP growth forecasts and inflation expectations, can provide insights into the future performance and creditworthiness of issuers.

While credit analysis remains a tool in assessing individual issuer creditworthiness, macro events provide a broader context and real-time indicators of market conditions, sentiment, and systemic risks. We have found that an increasing number of practitioners view macro events as possessing more predictive power in fixed-income credit pricing and risk compared to credit analysis due to several factors.[13] While more information does improve outcomes, we propose that traditional credit research has diminishing value while incurring high costs today, whereas credit ratings capture much more information. Rather, it is better to focus on current macro factors that are more influential in credit default events than credit analysis, which has limited information outside of information already captured in credit ratings.

Many firms today are using a *hybrid approach*, combining a statistical approach with a structural credit model. By considering both macro events and efficient quantitative credit analysis, Portfolio Managers can obtain a more comprehensive and robust assessment of fixed-income credit pricing and risk. This hybrid approach improves security selection in two ways:

1. Enhanced Accuracy
   Quantitative techniques can process vast amounts of historical data to analyze credit risk. By incorporating multiple data sources and computation-heavy risk models, these methods can provide a comprehensive risk assessment and allow portfolio managers to make more informed decisions and manage their portfolio risks effectively. Additionally, these methods can provide more accurate credit assessments by considering a broader range of factors and capturing subtle patterns that may be missed by human analysts. Human analysts can exhibit biases and subjectivity in their credit analysis, leading to inconsistent evaluations. In contrast, quantitative models follow predefined rules and algorithms, ensuring consistent and objective credit assessments. This consistency is particularly valuable in large-scale credit analysis, where uniformity is crucial.

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[12] Brooks et. al., Active Fixed Income Illusions.
[13] Bondioli et. al., The Bloomberg Corporate Default Risk Model (DRSK) for Public Firms.

2. Speed and Adaptability

   The financial markets and credit environments are dynamic and can experience rapid changes. Traditional credit analysis methods often involve manual processes, extensive paperwork, and time-consuming research. In contrast, quantitative approaches can quickly process and analyze large datasets, significantly reducing the time and effort required to assess credit risk. These methods can process large datasets, extract relevant information, and uncover hidden patterns, resulting in more robust credit assessments. Quantitative credit analysis models can adapt quickly to changing market conditions by incorporating new data and adjusting their algorithms. Models can be rerun daily to compare securities most accurately, apples-to-apples, based on current economic and market conditions and not possibly stale credit reports. This increased efficiency allows for faster decision-making and enables investors to capitalize on market opportunities more promptly. This adaptability ensures that credit assessments remain up-to-date and relevant in evolving market scenarios, unburdened by legacy overhead.

Conclusions

Long-term longitudinal research from a comprehensive data set shows that macroeconomic signals, basic credit metrics that could be processed through quantitative methods, and credit ratings combined explain most credit defaults. Findings show there is limited value in explaining IG credit defaults outside of these factors. In fact, defaults are relatively rare events; since the Great Depression, IG credit defaults have peaked at 3% or less. However, when credit defaults do happen, they occur in clusters during periods of economic distress. Defaults are clustered mostly due to deteriorating credit lending after defaults begin during economic crises and reflect lending rather than the borrower's fundamental credit health.

We believe that it is better to understand macro signals and their impact on credit. Fundamental credit analysis is overly relied upon, overlooking significant macro signals. We believe that much of the information gained from fundamental credit analysis can be acquired from quantitative credit analysis. Our thesis is that the best method is to combine a quantitative credit analysis with macro signals on credit risk across the entire universe of credits, viewed through an objective lens. Quantified credit analysis offers differentiated credit analysis from credit rating data and is a more thorough and unbiased process to assess credit risk. By leveraging quantitative credit analysis techniques, investment managers can gain a competitive edge, make better-informed credit decisions, and achieve more accurate risk assessments in investment grade credit markets.

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