

The potential impact of recession on credit risk transfer exposures

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Using Milliman's credit risk transfer analysis tool, M-PIRe, to model portfolio cash flows under alternative economic scenarios.

The United States is experiencing one of the longest economic recoveries in modern times. However, given the unprecedented length of this economic recovery and a few additional indicators, an increasing number of economists and experts anticipate that the end of the long recovery is near. For example, Paul Krugman (a Nobel Prize-winning economist) stated on February 10, 2019, that “I think that there is a quite good chance that we will have a recession late this year (or) next year.”

A recession is defined as a period of temporary economic decline during which trade and industrial activities are reduced, generally identified by a fall in gross domestic product (GDP) for two consecutive quarters.¹ Though the fundamentals of the U.S. economy remain sound (low unemployment rate, strong GDP growth, etc.), there are a number of events that could contribute to an economic slowdown, including a government shutdown, Brexit, trade tension between the world's largest economies (United States and China), and the stock market volatility observed in December 2018.

While there has never been a consensus on what causes recessions, many economists have argued that an inversion of the yield curve is a reliable predictor of a recession. The yield curve inverts when short-term interest rates are higher than long-term interest rates. As of early 2019, the U.S. bond market is near an inversion, adding additional fuel to predictions that there may be a downturn in the near future.

The U.S. economy has experienced many recessions. Some are mild and focused in specific industries or sectors, like the recession of 2001 that was tech-centered, while others are global and widespread, like the global financial crisis of 2007-2010. Given our focus on the housing economy, this article reviews the potential impact of a mild recession on the portfolio of investors involved in mortgage credit risk transactions—i.e., Structured Agency Credit Risk (STACR),

Agency Credit Insurance Structure (ACIS), Credit Insurance Risk Transfer (CIRT), and Connecticut Avenue Securities (CAS) deals—using our proprietary M-PIRe platform.²

Economists have officially identified 33 recessions in the United States since 1854 (on average, one every five years). Since 1980, there have been four periods of negative economic growth that were considered recessions. Below is a brief description of each period.³

- **July 1981-November 1982:** This recession affected most of the developed world between the late 1970s and early 1980s. During this time, the Federal Reserve wanted to rein in inflation and, as a result, began to tighten its monetary policy. Effects from the energy crisis in 1979 (the output of crude oil dropped in the wake of the Iranian Revolution, causing an uptick in prices) were also felt throughout the economy. U.S. unemployment peaked at 10.8% in November 1982 and GDP declined 2.7%.
- **July 1990-March 1991:** This downturn was caused by a combination of the Iraqi invasion of Kuwait in 1990 (which caused a shock to oil prices), weaker consumer and business confidence, and declining employment. It was estimated that the economy lost about 1.6 million jobs during this period—most of which were in the construction and manufacturing sectors.
- **March 2001-November 2001:** This downturn was a result of Y2K concerns, when so-called dot-com companies were enjoying relatively high interest from investors. This boom led to a bust, with stock prices plummeting along with the values of many high-tech companies. But at the time, the Fed continued to raise interest rates, making it more difficult for companies to obtain (cheaper) credit to stay afloat. The 9/11 attacks also took place during this period, which worsened the crisis. The New York Stock Exchange (NYSE) closed for four days and U.S. indices dropped to some of their lowest levels following the attacks.

1 Investopedia. Recession. Retrieved March 8, 2019, from <https://www.investopedia.com/terms/r/recession.asp>.

2 M-PIRe is Milliman's cloud-based platform for evaluating credit risk transfer deals for either bond or insurance participation. The platform includes all the data, models, cash flow waterfall structures, and interactive dashboards required to participate and analyze public and private structured mortgage transactions.

3 Investopedia, Recession, op cit.

- **December 2007-June 2009:** The housing bubble, fueled in part by a significant growth in subprime mortgages, burst. Oil and food prices still rose, despite a drop in housing-related assets. Many of the country's large financial institutions failed or collapsed, including Fannie Mae, Freddie Mac, Lehman Brothers, Bear Stearns, and AIG. The nation's car industry also experienced a fallout and stock markets saw significant drops. The government responded by introducing a \$787 billion stimulus package to fuel economic growth.

As difficult as it is to predict the timing of future recessions, the potential effects and severity are even more difficult to estimate. However, there are some general similarities in economic data. During a recession, there is often an increase in the unemployment rate, and a rise in consumer credit delinquencies and foreclosures. During the latest recession, mortgage default rates shot up to their highest levels ever, peaking at nearly 9% of all outstanding mortgages.⁴

After the crisis, many changes were made to the housing system in order to avoid a repeat of the crisis, and the government ended up taking on an increased role in the market through the conservatorship of Freddie Mac and Fannie Mae. Both entities are regulated by the Federal Housing Finance Agency (FHFA), which provides annual goals for each enterprise. One of those goals is to enter into credit risk transfer (CRT) deals with the private market. Specifically, for 2019, FHFA requires Freddie Mac and Fannie Mae to transfer 90% of the credit risk from certain mortgages. To date, Freddie Mac and Fannie Mae have transferred the credit risk of over \$2 trillion of mortgages to the private market through the issuance of CAS and STACR bonds and CIRT and ACIS insurance transactions.

This article looks at how various recession scenarios might affect investors in these CRT transactions. Specifically, we look at the expected future cash flows for insurance participants in the highest-rated and lowest-rated transactions from 2016 and 2017 under three different economic scenarios: a baseline scenario, a mild recession, and a repeat of 2007. The table in Figure 1 provides a summary of select economic conditions for these scenarios, including effects in basis points (bps).

4 The New York Fed 2018 Q3 Quarterly Report on Household Debt and Credit.

FIGURE 1: THREE ECONOMIC SCENARIOS

	HOME PRICES	UNEMPLOYMENT RATE	INTEREST RATES
Baseline	Average home price appreciation of 2% to 4% per year for forecast period	Slight rise in the unemployment rate from current levels to long-term trend	Steady increase in 10-year yield from 3.5% to 4.3% over next five years
Mild Recession	A 6% decline in home prices followed by a quick rebound in prices then long-term trend	200 bps increase in unemployment rate over next two years	Gradual 100 bps decrease in rates followed by a 100 bps increase in rates
2007 Repeat	30% decline in home prices followed by a slow recovery to long-term trend	500 bps increase in unemployment rate over next two years	Prolonged decline in interest rates and low interest rate thereafter

We used M-PIRE to evaluate the future cash flows from insurance participation in 2016 and 2017 vintage deals. In order to understand how each scenario impacts the tranches differently, we created eight portfolios of credit risk transfer exposures. In the portfolios, please note the following terminology:

- The “M-1” tranche represents the most senior position in the capital structure of a given deal. It has the highest level of credit enhancements (typical initial credit enhancement of 2.5% to 3.0%) and lowest premium rate (typically around 1.0% of remaining limit).
- A deal with a high loan-to-value (LTV) ratio is a deal that is collateralized by loans with original LTV ratios above 80; the loans generally have private mortgage insurance.
- The “B” tranche represents the most junior position in the capital structure of a given deal. It has the lowest level of credit enhancements (typical initial credit enhancement of 0.0% to 0.5% for 2016 and 2017 deals, respectively) and highest premium rate (around 8.5% to 5.0% of remaining limit for 2016 and 2017 deals, respectively).

The eight portfolios are:

1. Portfolio of 2016 vintage deals equally weighted in the “M-1” tranche for each high-LTV deal.
2. Portfolio of 2016 vintage deals equally weighted in the “M-1” tranche for each low-LTV deal.
3. Portfolio of 2016 vintage deals equally weighted in the “B” tranche for each high-LTV deal.
4. Portfolio of 2016 vintage deals equally weighted in the “B” tranche for each low-LTV deal.
5. Portfolio of 2017 vintage deals equally weighted in the “M-1” tranche for each high-LTV deal.
6. Portfolio of 2017 vintage deals equally weighted in the “M-1” tranche for each low-LTV deal.
7. Portfolio of 2017 vintage deals equally weighted in the “B” tranche for each high-LTV deal.
8. Portfolio of 2017 vintage deals equally weighted in the “B” tranche for each low-LTV deal.

The table in Figure 2 provides a summary of the results of the analysis.

FIGURE 2: SUMMARY OF ANALYSIS

PORTFOLIO	BASELINE			MILD RECESSION			2007 REPEAT		
	PREMIUM	LOSSES	LOSS RATIO	PREMIUM	LOSSES	LOSS RATIO	PREMIUM	LOSSES	LOSS RATIO
2016 M-1 High LTV	1.4%	0.0%	0.0%	1.4%	0.0%	0.0%	1.4%	0.0%	0.0%
2016 M-1 Low LTV	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%
2016 B High LTV	108.9%	12.5%	11.5%	104.8%	14.7%	14.0%	96.1%	40.5%	42.1%
2016 B Low LTV	103.5%	12.3%	11.9%	99.0%	15.8%	16.0%	88.7%	47.5%	53.5%
2017 M-1 High LTV	2.0%	0.0%	0.0%	1.9%	0.0%	0.0%	2.0%	0.0%	0.0%
2017 M-1 Low LTV	2.6%	0.0%	0.0%	2.4%	0.0%	0.0%	2.6%	0.0%	0.0%
2017 B High LTV	58.9%	0.0%	0.0%	58.9%	0.0%	0.0%	53.3%	41.4%	77.6%
2017 B Low LTV	61.3%	0.0%	0.0%	59.1%	0.0%	0.0%	51.6%	57.7%	111.8%

From Figure 2, participants in 2016 and 2017 credit risk transfer insurance deals appear to have adequate credit enhancement to withstand not only a mild U.S. recession but also a severe housing recession for the majority of exposures. Using M-PIRe, the model forecasts indicate participants in the senior tranches would not experience credit events, even if we repeat a 2007 crisis. There are multiple reasons for this:

1. Many of the most senior exposures have durations of one to three years, and it takes time for losses to develop on mortgage collateral. Therefore, under all but the most severe scenarios, these tranches tend to have few, if any, credit events.
2. The collateral underlying these deals has significantly lower risk profiles compared to the majority of loans pooled and securitized in private label mortgage-backed securities in 2007. Therefore, even during a period of great stress in the housing market, the collateral losses are lower than the collateral losses observed on comparable private label mortgage-backed securities and do not breach the initial credit enhancement in the current CRT structures.

The junior tranche participants may experience some losses in a mild recession, but the losses would be relatively mild with loss ratios below 20%. Note that, for the 2016 deals, the “B” tranches are in a first-loss position with no initial credit enhancement. For the 2017 deals, a retained layer is in a first-loss position that provides 0.50% credit enhancement to the “B” tranches. This is why the loss ratio on the 2016 deals is higher than the 2017 deals under a mild recession scenario.

In a 2007 repeat, more recent deals (i.e., 2017 vintage) could experience loss ratios in excess of 100%. The 2016 vintage deals have enough seasoning and built-up equity in the underlying collateral to likely withstand a repeat of 2007 economic conditions.

Note that credit risk transfer deals have more tranches than equity (“B” tranche) or senior (“M-1” tranche). The performance of the mezzanine tranches will lie somewhere between the most senior and junior tranches and will depend on the deal structure and cash flow triggers. The premium and losses in the table above are shown as percentages of the original limit.

Conclusion

It is difficult to predict when the economy will experience a downturn, or the depth and impact of that downturn on the economy. Investors and reinsurers can nevertheless prepare for various economic scenarios by using the tools available to better understand their portfolios and position themselves for all eventualities.

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