THE CASE FOR STRUCTURED SECURITIES

September 2021

Structured securities — namely asset-backed securities (ABS) and agency mortgage-backed securities (MBS) — can play an important role in optimizing a portfolio's risk-reward profile.

We employ structured securities in our strategies, consistent with our view that fixed income should serve as a lower-risk, diversifying anchor of an investor's portfolio. By applying the requisite expertise and due diligence necessary to incorporate structured securities in our clients' investment strategies, we believe we can meaningfully enhance overall investment results. Accordingly, our investment approach often emphasizes MBS and ABS in portfolio construction, particularly in shorter-duration investment strategies. The enhanced income, improved diversification and comparatively lower volatility offered by pooled receivables make it a compelling asset class.

MBS

Mortgage-backed Securities

In the case of agency MBS, we believe the sector offers strong diversification benefits, as the credit and MBS markets are driven by different economic and market dynamics — business fundamentals versus interest rate volatility, respectively. Interest rate movement has the largest impact on MBS relative performance due to its influence on the timing of cash flows through the repayment of principal.

The primary risk to agency MBS securities emanates from the borrower's ability to prepay their mortgage at any time without penalty. For example, when interest rates decline, borrowers are incented to refinance their mortgage. While the borrower reaps a clear benefit to refinancing, this results in a prepayment to the MBS investor at par, which causes the investor to reinvest those proceeds at lower rates. Conversely, when rates rise, there is no incentive for borrowers to prepay their mortgage, thus delaying the repayment of principal at a time when interest rates are more attractive.

Fortunately, for MBS investors, there are friction costs for mortgage borrowers that makes this "call" feature relatively inefficient. Additionally, prepayment risk is partially mitigated by the diversification benefits associated with the securitization process, as hundreds if not thousands of loans are aggregated to form a pool. Each mortgage pool has unique attributes (e.g., loan type, term, loan balance, age, geography) that can significantly impact cash flow variability. This presents security selection opportunities for MBS investors. Accordingly, we use robust analytical models to forecast cash flows based on various interest rate and prepayment scenarios to assess risk and relative value.

ABS

Asset-backed Securities

Perhaps a much less understood market than agency MBS, the ABS sector offers similar diversification benefits relative to credit but has very little exposure to prepayment volatility and thus relative performance is not interest-rate driven. Asset-backed securities are commonly secured by financial assets, such as auto loans, equipment loans and credit card receivables. The securitization process allows lenders to diversify their sources of funding while providing investors access to a high-quality asset class that can satisfy a variety of maturity and risk preferences. Our investment strategy focuses on securities at the highest level of the capital structure that are AAA-rated.

In addition to a diverse pool of underlying collateral, ABS transactions incorporate a variety of credit enhancements and structural features. These come in different formats and amounts depending on the ABS type. Auto and Equipment ABS typically have a structure that incorporates a series of sequential classes in which investors of the respective classes are repaid in order of maturity and seniority. Other features include credit enhancements, such as a cash reserve, overcollateralization and/or subordination, which serve to insulate investors at the top of the capital structure

from losses. Credit Card ABS securities typically have a senior/subordinate structure, as well as internal triggers designed to protect the investor in the event of a deterioration in the quality of the pool or seller/servicer.

When selecting appropriate ABS for our client portfolios, we focus on strong sponsors with solid industry track records and consistently robust underwriting criteria. In addition, our analysis uses a "belt and suspenders" approach whereby we assess the structure/credit enhancements, as well as the collateral characteristics and historical repayment trends to validate the quality of the underlying assets.

In the context of risk-adjusted portfolio optimization, we believe the diversification benefits from incorporating MBS and ABS enable us to move further out the efficient frontier in portfolio construction. Our historical analysis over the past 20-plus years shows a low correlation between structured securities and credit sectors. Moreover, MBS and ABS have exhibited significantly less volatility of excess return than credit sectors over the same period. This is largely due to the high-quality nature and shorter duration profile of structured product sectors relative to the overall credit index.

Thus, we believe in many cases structured securities should be an integral component of fixed income strategies that seek to optimize risk-adjusted performance. However, given their perceived complexities, it's understandable why some investors may be reticent to incorporate structured securities in their portfolios. We caution against painting structured securities with too broad a brush, as this misconception could result in suboptimal asset allocation, particularly when it comes to the tradeoff between risk and return.

To assess the risk/return trade-off of MBS and ABS, we calculate a modified information ratio (MIR) by dividing realized excess returns relative to duration-matched U.S. Treasuries by the volatility of those excess returns. We use this metric to compare sectors with distinct investment risks and characteristics. Figure 1, highlights the compelling MIRs (higher indicates better relative risk-adjusted return) and low correlations relative to corporate credit.

Favorable Characteristics of ABS

- Large and diverse pools of consumer obligations providing predictable cash flows
- Bankruptcy-remote assets from the underlying seller-servicer
- Short-term exposure – weighted average life of generally less than three years
- Credit enhancement features that contribute to the durability of the individual structures
- Consistent performance in terms of charge-offs and delinquencies
- Stable ratings with very few downgrades among the highest quality sectors

Figure 1

	1997-2021[5]			
Sector	Avg Excess Return (% per yr)	Volatility (% per yr)	Modified Info Ratio	Correlation to Corporate Credit[4]
MBS 30 Year[1]	0.404	1.286	0.314	0.436
MBS 15 Year[2]	0.336	1.079	0.311	0.452
AAA ABS - CC & Auto[3]	0.546	0.839	0.651	0.733[6]

(1) - ICE BofA U.S. FHLMC and FNMA 30-Year MBS indices. (2) - ICE BofA U.S. 15-Year MBS Index. (3) - ICE BofA AAA U.S. Fixed Rate Credit Card ABS and ICE BofA AAA U.S. Fixed Rate Automobile ABS indices. (4) - ICE BofA U.S. Corporate Index. (5) - We exclude the time period between June 2008 and September 2009 from the return series due to the exceptional volatility and correlations of excess returns exhibited at that time. During this period, primary fixed-income sectors experienced returns that were multiple standard deviation events relative to the historical evidence of the past 40 years. (6) - The long-term correlation between ABS and corporate credit increased from 0.49 to 0.73 due to the period of significant risk aversion and subsequent recovery in risk assets from March through June 2020.

As of 6/30/21. Source: ICE BofA Global Bond Indices, PNC Capital Advisors.

The diversification benefit provided by incorporating structured securities in portfolios can be further illustrated by comparing two indices, one consisting solely of government and credit sectors (Bloomberg Government/ Credit Index) and the other that includes structured products (Bloomberg Aggregate Bond Index). As shown in Figure 2, adding structured products to a government-credit portfolio over the same period would have produced an enhanced average annual excess return, a reduction in return volatility, and a higher modified information ratio.

Figure 2

	1997-2021[1]		
Index	Avg Excess Return (% per yr)	Volatility (% per yr)	Modified Info Ratio
Bloomberg US Gov/Credit Index	0.382	1.516	0.252
Bloomberg US Aggregate Index	0.389	1.280	0.304

(1) - We exclude the time period between June 2008 and September 2009 from the return series due to the exceptional volatility and correlations of excess returns exhibited at that time. During this period, primary fixed-income sectors experienced returns that were multiple standard deviation events relative to the historical evidence of the past 40 years.

As of 6/30/21. Source: Bloomberg Indices, PNC Capital Advisors.

Presentation of Performance of Market Indices

Various market indices may be referred to in these materials. Please see following for a brief description of these indices and comparisons. Indices are unmanaged and not available for direct investment. The performance of an index does not reflect expenses associated with the active management of an actual portfolio.

The **ICE BofA US Mortgage Backed Securities Index** tracks the performance of US dollar denominated fixed rate residential mortgage pass-through securities publicly issued by US agencies in the US domestic market. 30-year, 20-year and 15-year fixed rate mortgage pools are included in the Index provided they have at least one year remaining term to final maturity and a minimum amount outstanding of at least $5 billion per generic coupon and $250 million per production year within each generic coupon. Hybrid, interest-only, balloon, mobile home, graduated payment and quarter coupon fixed rate mortgages are excluded from the index, as are all collateralized mortgage obligations.

The **ICE BofA Conventional 30-Year Mortgage backed Securities Index** is a subset of ICE BofAML US Mortgage Backed Securities Index including all 30-year securities issued by Fannie Mae and Freddie Mac except for interest-only fixed rate mortgage pools and hybrids.

The **ICE BofA US 15-Year Mortgage Backed Securities Index** is a subset of ICE BofAML US Mortgage Backed Securities Index including all 15-year securities except for interest-only fixed rate mortgage pools and hybrids.

The **ICE BofA AAA US Credit Card Asset Backed Securities Index** is a subset of ICE BofAML US Fixed Rate Asset Backed Securities Index including all asset backed securities collateralized by credit card loans and rated AAA.

The **ICE BofA AAA US Fixed Rate Automobile Asset Backed Securities Index** is a subset of ICE BofAML US Fixed Rate Asset Backed Securities Index including all securities collateralized by auto loan receivables and rated AAA.

The **Bloomberg US Aggregate Bond Index** is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate pass-throughs), ABS and CMBS (agency and non-agency).

The **Bloomberg US Government Credit Bond Index** is a broad-based flagship benchmark that measures the non-securitized component of the US Aggregate Index. The index includes investment grade, US dollar-denominated, fixed-rate treasuries, government-related and corporate securities.

The **ICE BofA US Corporate Index** tracks the performance of US dollar denominated investment grade corporate debt publicly issued in the US domestic market.

Important Disclosures

"Bloomberg®" and the Bloomberg indices are service marks of Bloomberg Finance L.P. and its affiliates, including Bloomberg Index Services Limited ("BISL"), the administrator of the index (collectively, "Bloomberg") and have been licensed for use for certain purposes by PNC Capital Advisors LLC. (PCA). Bloomberg is not affiliated with PCA, and Bloomberg does not approve, endorse, review, or recommend this material. Bloomberg does not guarantee the timeliness, accurateness, or completeness of any data or information relating to the information herein.

ICE Data Indices, LLC ("ICE Data"), is used with permission. ICE Data, its affiliates and their respective third party suppliers disclaim any and all warranties and representations, express and/or implied, including any warranties of merchantability or fitness for a particular purpose or use, including the indices, index data and any data included in, related to, or derived therefrom. Neither ICE Data, its affiliates nor their respective third party suppliers shall be subject to any damages or liability with respect to the adequacy, accuracy, timeliness or completeness of the indices or the index data or any component thereof, and the indices and index data and all components thereof are provided on an "as is" basis and your use is at your own risk. ICE Data, its affiliates and their respective third party suppliers do not sponsor, endorse, or recommend PNC Bank, NA, or any of its products or services.

This publication is for informational purposes only. Information contained herein is believed to be accurate, but has not been verified and cannot be guaranteed. Opinions represented are not intended as an offer or solicitation with respect to the purchase or sale of any security and are subject to change without notice. Statements in this material should not be considered investment advice or a forecast or guarantee of future results. To the extent specific securities are referenced herein, they have been selected on an objective basis to illustrate the views expressed in the commentary. Such references do not include all material information about such securities, including risks, and are not intended to be recommendations to take any action with respect to such securities. The securities identified do not represent all of the securities purchased, sold or recommended and it should not be assumed that any listed securities were or will prove to be profitable. **Past performance is no guarantee of future results.**

PNC Capital Advisors, LLC claims compliance with the Global Investment Performance Standards (GIPS®). A list of composite descriptions for PNC Capital Advisors, LLC and/or a presentation that complies with the GIPS® standards are available upon request.

PNC Capital Advisors, LLC is a wholly-owned subsidiary of PNC Bank N.A. and an indirect subsidiary of The PNC Financial Services Group, Inc. serving institutional clients. PNC Capital Advisors' strategies and the investment risks and advisory fees associated with each strategy can be found within Part 2A of the firm's Form ADV, which is available at https://pnccapitaladvisors.com.

©2022 The PNC Financial Services Group, Inc. All rights reserved.

FOR INSTITUTIONAL USE ONLY

INVESTMENTS: NOT FDIC INSURED-NO BANK GUARANTEE - MAY LOSE VALUE