

Mendocino County: Structured Products Education Session

July 17, 2024

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Roles of Fixed Income



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Fixed Income Markets > Large and Diversified

The breadth and depth of fixed income markets offer opportunities for security selection and thoughtful relative value analysis.



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Fixed Income Markets > Lower Volatility

Bonds typically exhibit lower volatility than other asset classes, contributing uncorrelated risk to a portfolio.

Historical Volatility Averages (based on calendar year 12-month return standard deviations, 2003-2023)



Historical Asset Class Correlations (based on calendar year 12-month total returns, 2003-2023)

	1-3 Yr	5-10 Yr	10+ Yr	Fixed Rate			HY	MSCI US	MSCI EM	Commodity
	Treasury	Treasury	Treasury	MBS	ABS	IG Corporate	Corporate	Equity	Equity	Index
1-3 Yr Treasury	1.00	0.77	0.58	0.78	(0.09)	0.30	(0.13)	(0.10)	0.05	(0.26)
5-10 Yr Treasury	0.77	1.00	0.93	0.82	(0.20)	0.35	(0.27)	(0.22)	(0.20)	(0.45)
10+ Yr Treasury	0.58	0.93	1.00	0.78	(0.17)	0.40	(0.23)	(0.12)	(0.17)	(0.43)
Fixed Rate MBS	0.78	0.82	0.78	1.00	0.25	0.69	0.22	0.13	0.24	(0.27)
ABS	(0.09)	(0.20)	(0.17)	0.25	1.00	0.75	0.94	0.62	0.79	0.40
IG Corporate	0.30	0.35	0.40	0.69	0.75	1.00	0.77	0.66	0.67	0.15
HY Corporate	(0.13)	(0.27)	(0.23)	0.22	0.94	0.77	1.00	0.72	0.82	0.48
MSCI US Equity	(0.10)	(0.22)	(0.12)	0.13	0.62	0.66	0.72	1.00	0.65	0.41
MSCI EM Equity	0.05	(0.20)	(0.17)	0.24	0.79	0.67	0.82	0.65	1.00	0.64
Commodity Index	(0.26)	(0.45)	(0.43)	(0.27)	0.40	0.15	0.48	0.41	0.64	1.00



Fixed Income Markets > Strong Risk-Adjusted Returns

Lower volatility of returns results in strong risk-adjusted returns (Sharpe ratios).

20-Year Historical Track Record by Asset Class (as of December 31, 2023)





Source: Bloomberg, MSCI.

Fixed Income Fundamentals > Total Return

Total Return = Price Change + Income + Income on Income + Income on Income + Income on Income + Income ...

- Over short periods of time, price change can be a meaningful driver of total returns.
- But over long periods of time, income typically overwhelms short-term price changes.

Cash flows from a hypothetical \$1 million, 5% bond with coupons reinvested

1	2	3	4	5	6	7	8	9	10
Period									
50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
		2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
		125	2,500	2,500	2,500	2,500	2,500	2,500	2,500
			125	2,500	2,500	2,500	2,500	2,500	2,500
			125	125	2,500	2,500	2,500	2,500	2,500
			125	125	125	2,500	2,500	2,500	2,500
			6	125	125	125	2.500	2,500	2,500
				125	125	125	125	2,500	2,500
				125	125	125	125	125	2 500
				125	125	125	125	125	125
				6	125	125	125	125	125
				6	125	125	125	125	125
				6	125	125	125	125	125
				6	120	120	120	120	120
				~	105	120	120	120	120
					2	125	125	125	125
					6	125	125	125	125
					6	125	125	125	125
					6	125	125	125	125
					6	125	125	125	125



Spread is compensation for all risks assumed for owning a bond vs. a riskless benchmark, including:

- 1) Interest Rate risk
- 2) Credit risk
- 3) Prepay/Extension risk
- 4) Liquidity risk
- 5) Currency risk

Changes in a bond's spread reflect changes in market participants' assessment of the bond's risks.

Spread = Yield (to maturity) of the bond – Yield (to maturity) of the risk-free benchmark



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Fixed Income Fundamentals > Price / Yield Relationship

Price is the sum of all future bond cash flows, discounted at the bond's yield

Yield (to maturity) is the expected total return if a bond were held to maturity and all coupons were reinvested at the original bond yield. The yield is the sum of the risk-free benchmark plus the spread paid for assuming additional risks.



Price and yield are inversely related for fixed-rate bonds

Fixed Income Fundamentals > Duration

Duration is the linear estimate of a bond's price sensitivity to changes in interest rates.

For small changes in interest rates, we can use duration to estimate the bond's change in price.



Duration = - Δ Price / Δ Yield

Fixed Income Fundamentals > Convexity

As rates change, duration (the slope) can change, making the price/yield relationship curved, not linear.

Measuring the **convexity** of this curve tells us *how* the duration changes as rates change.

Now we can more precisely estimate the impact of rate changes on bond prices.





Fixed Income Fundamentals > Negative Convexity

Securities with embedded prepayment options, such as mortgage-backed securities (MBS), carry prepayment and extension risk, resulting in a concave shape, or what is called *negative* convexity.

A rate increase or decrease can then cause MBS duration to also increase or decrease, respectively, exacerbating price declines and restraining price increases. As a result, MBS outperform within a range of rate changes.

To invest in the MBS market is to manage this zone of outperformance.



MBS have a 'zone' of outperformance

The securitized markets offer a large opportunity set to add value across various asset types, each with its own risks and benefits.



Structured Products > Themes

Dodge & Cox Income Fund

Our fundamental research process includes detailed analysis of security characteristics, including risks, return potential, and valuation. This leads to an idiosyncratic group of structured products characterized by what we believe are higher potential risk-adjusted returns.

	30-Year Fixed Rate Agency MBS (including TBA)	FFELP ABS	HECMs	Hybrid ARM	Multifamily IOs	
Security Description	GSE-guaranteed mortgage- backed securities (MBS) backed by fixed-rate, single family mortgages	Federally-guaranteed Ginnie Mae guaranteed cMOs backed by backed securities (ABS) reverse mortgages		GSE-guaranteed pools of underlying mortgages that are fixed-rate for a period, then convert to floating- rate	Interest-only securities backed by Freddie Mac- underwritten multifamily loans	
Security Characteristics	 Sector has a high Sharpe ratio Large, complex market provides active management opportunities Low-coupon MBS with low loan balances mitigate prepayment/extension risk 	 Paid off at par in the event of loan forgiveness (bonds are currently trading at a discount) Floating-rate coupon = defensive duration 	 Ginnie Mae = full faith and credit Floating-rate coupon = defensive duration Small, poorly understood government program provides active management opportunities 	Smaller pools, often with high originator concentration, create opportunities for security selection	 Prepayment penalties encourage stable cash flow Historically durable collateral with low credit risk 	
Relative Value	Attractive risk-adjusted spreads above Treasuries	Attractive spreads with low credit and prepayment risk in the short maturity sector	Near-par dollar prices and attractive spreads in the short maturity sector	Attractive potential returns vs. 15yr MBS and other shorter- duration alternatives	Attractive potential returns across a range of rate, prepayment, and default scenarios	
Example Exposure	20-30%	~5%	~5%	~2%	~0.5%	
Liquidity	Exceptional	Hig	gh, but lower than Agency	Fixed Rate MBS passthroughs		
Index Eligible	Eligible	Ineligible				

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Structured Products > Diversification

The corporate bond market faces different valuation drivers than structured products markets, making them useful diversification tools as relative value changes over time.

Corporate spreads have tightened over 70bps from 2022 wides of +165bps



Corporate spreads have tightened over 70bps relative to ABS and MBS since the wides of 2022



Source: Bloomberg.

Structured Products > Historical Returns

March 31, 2024

The ABS and MBS sectors have historically produced attractive risk-adjusted returns on both an absolute and a relative basis.



Average 12-month Returns vs. Standard Deviation of Returns^(a)

Average 12-month "Excess" Returns^(a)



(a)For the one-year periods 3/31/2004 - 3/31/2024.

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Structured Products > Risks in Fixed-Income Investing

Our fixed-income investment risk management process combines bottom-up fundamental research with quantitative analysis. We seek to identify and quantify a portfolio's main investment risks, understand how the risks of individual investments interact at the portfolio level, and evaluate whether we are adequately compensated for those risks.



*Applies to institutional separately managed accounts

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Structured Products > Agency MBS Fundamentals

We view active management of MBS from the bottom up, focusing on borrower behavior and how that may be impacted over time by the borrower's profile, loan features, and external factors such as public policy and servicer behavior.

Borrower Profile

- Credit How does the borrower's credit quality impact their ability to refinance?
- Equity Position How does the borrower's equity position (loan-to-value ratio) impact their ability to refinance?
- Geographic location How does the borrower's location influence their decision and ability to refinance?

Loan Characteristics

- WAC (Weighted Average Coupon) What is the refinancing incentive for the borrower?
- Balance How does the loan size impact the borrower's incentive and ability to refinance?
- Loan Age How do the mortgage's age and borrower's past behavior impact average life variability?
- Amortization Schedule (e.g., 30-year, 15-year, Interest-only Period)

External Factors

- Servicer Is the pool serviced by an efficient servicer? How is the servicing business evolving over time?
- Program of Origination (e.g., HFA securities, VA Vendee securities, DUS)
- Government What are the effects of pending or potential policy changes or government programs?

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Structured Products > Agency MBS Stories

Cash flow variability is the primary risk assumed by Agency MBS investors (due to negative convexity). Security selection involves identifying and valuing pools that are expected to feature slower/faster prepayment speeds compared to cohort while in a premium/discount environment.

Examples of Agency MBS Security Selection 'Stories'

Premium Environment	Discount Environment
• Loans with low loan balances require the same fixed costs to refinance, constituting a larger <i>percentage</i> of the loan amount, reducing the rate incentive to refinance.	 Borrowers with low loan balances have greater mobility as the monthly payment increase on a new loan with a higher rate is relatively small.
 Loan types requiring higher rates than average: Investor property High LTV Low credit score Second homes 	likely boosting turnover activity.
 Loans in states with some form of mortgage origination tax, reducing incentive to refinance. New York Florida 	
 Pools containing seasoned loans, which are less likely to refinance, all else equal, if they remain in the pool despite having incentive to refinance. 	

Attractive Spreads at Low Dollar Prices

- Provide portfolio with incremental yield, high credit quality, and strong liquidity in the intermediate part of the yield curve.
- Utilize in-house fundamental research on borrower, loan, and program characteristics to identify attractive total return opportunities over a robust range of interest rate scenarios.
- Focus on Agency-guaranteed collateral (including TBA when attractive), opportunistically investing in non-Index Agency MBS.
- Seek to avoid highly volatile securities with pronounced asymmetric return profiles.
- Calibrate overall MBS allocation based on relative value, incorporating scenario analysis of potential total returns vs. similar-duration alternatives.

MBS Outlook

- Low prepayment/extension risk: The great majority of homeowners have no incentive to refinance at current rates and baseline prepayment speeds are likely to fall within a relatively narrow range.
- Attractive relative valuation: Spreads look relatively attractive for discount dollar priced MBS with strong fundamentals.
- Attractive potential returns: Compelling potential total returns across a range of future economic scenarios over our investment horizon.
- Primary risks: Rate volatility outside of the outperformance zone and spread widening due to supply/demand technical (among other drivers).



Slower Pre-Payment Speeds and Higher Mortgage Rates

Structured Products > Strategy Evolution

Dodge & Cox Income Fund



Sector Composition

^(a)Includes 20 year pass-throughs.

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Structured Products > Strategy Evolution

Dodge & Cox Income Fund

We constantly monitor the mortgage-backed securities (MBS) market and our portfolio, adjusting our portfolio positioning strategically to take advantage of total return opportunities that change over time.

1990s-2003: the "GSE Era"

Large demand for negatively convex residential MBS from leveraged investors looking to earn equity-like returns. This made less negatively convex MBS such as well-structured CMOs, 15-year MBS, and "special program" MBS (e.g. VA Vendees) attractive.

2003-2006: the "Bank Era"

Following the accounting scandals at the GSEs in 2003 and 2004, and amidst a steep yield curve environment, banks with accounting and regulatory constraints emerged as the largest buyers in agency MBS. High dollar priced MBS-like premium 15-year pass-throughs and FHA/VA reperforming securities – MBS that were difficult for banks to purchase – became attractive.

2007-2012: The Credit Crisis, Great Recession and the "Federal Reserve Era"

Potentially more negatively convex mortgages like legacy, higher-coupon securities outside of the Federal Reserve's large scale asset purchase programs were attractively priced. Prepayment fundamentals improved due to diminished refinancing options given financial and housing market distress, which led to significant investment in pre-crisis 30-year premium MBS.

2012-2019: Era of Normalization

Incremental ease in obtaining a mortgage through a moderating regulatory environment, stable to increasing nationwide home prices, incremental operational improvements by lenders and normalization of the Fed balance sheet.

2019-Current: "Pandemic Era"

Federal Reserve takes broad action to mitigate economic damage from the COVID-19 pandemic including open ended purchasing of government guaranteed mortgage-backed securities to support smooth market functioning and effective transmission of monetary policy. Growth continued in mortgage industry with operational improvements from multiple non-bank mortgage servicers leading to fast and efficient mortgage refinancing.

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Source Citations

Bloomberg

Bloomberg U.S. Aggregate Bond Index: The Bloomberg U.S. Aggregate Bond Index is a widely recognized, unmanaged index of U.S. dollardenominated, investment-grade, taxable fixed income securities.

Bloomberg Global Aggregate Bond Index: The Bloomberg Global Aggregate Bond Index is a widely recognized, unmanaged index of multicurrency, investment-grade fixed income securities.

Bloomberg U.S. Corporate Bond Index measures the investment grade, fixed-rate, taxable corporate bond market. It includes USD denominated securities publicly issued by US and non-US industrial, utility and financial issuers.

Bloomberg U.S. Mortgage Backed Securities (MBS) Index tracks fixed-rate agency mortgage backed pass-through securities guaranteed by Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC). The index is constructed by grouping individual TBA-deliverable MBS pools into aggregates or generics based on program, coupon and vintage.

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Other

Combined Index: The Combined Index reflects an unmanaged portfolio (rebalanced monthly) of 60% of the S&P 500 Index, which is market capitalization-weighted index of 500 large-capitalization stocks commonly used to represent the U.S. equity market, and 40% of the Bloomberg U.S. Aggregate Bond Index, which is a widely recognized, unmanaged index of U.S. dollar-denominated, investment-grade, taxable fixed income securities.

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MSCI ACWI ex USA Index: The MSCI ACWI (All Country World Index) ex USA Index is a broad-based, unmanaged equity market index aggregated from developed and emerging market country indices, excluding the United States.

MSCI EAFE Index: The MSCI EAFE (Europe, Australasia, Far East) Index is a broad-based, unmanaged equity market index aggregated from developed market country indices, excluding the United States and Canada. It covers approximately 85% of the free float-adjusted market capitalization in each country. MSCI EAFE is a service mark of MSCI Barra.

MSCI Emerging Markets Index: The MSCI Emerging Markets Index captures large and mid-cap representation across emerging market countries. MSCI Emerging Markets is a service mark of MSCI Barra.

MSCI World Index: The MSCI World Index is a broad-based, unmanaged equity market index aggregated from developed market country indices, including the United States. It covers approximately 85% of the free float-adjusted market capitalization in each country. MSCI World is a service mark of MSCI Barra.

MSCI ACWI Value Index: The MSCI ACWI Value Index captures large- and mid-cap securities exhibiting overall value style characteristics across developed market and emerging market countries. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield.

MSCI ACWI ex USA Value Index: The MSCI ACWI ex USA Value Index is a broad-based, unmanaged equity market index of largeand mid-cap securities exhibiting overall value style characteristics aggregated from developed and emerging market country indices, excluding the United States.

MSCI EAFE Value Index: The MSCI EAFE Value Index is a broad-based, unmanaged equity market index of large- and mid-cap securities exhibiting overall value style characteristics aggregated from 21 developed market country indices, excluding the United States and Canada.

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