Opportunities in Mortgage Derivatives

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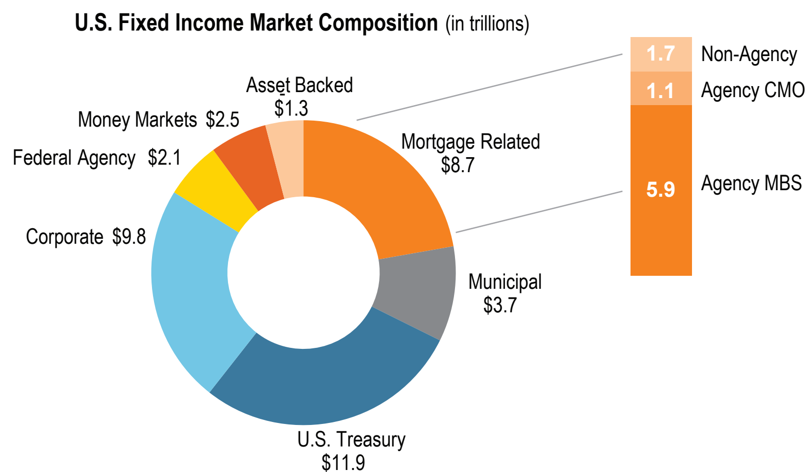
Introduction

With approximately $8.7 trillion outstanding, mortgage-backed securities (MBS) are among the largest sectors of the U.S. bond market. And given its lack of homogeneity, mortgages offer many alpha-generating opportunities.

As you can see in Figure 1, the bulk of the mortgage-backed bond market is comprised of agency MBS; that is, securitized pools of mortgages guaranteed by Ginnie Mae (a federal agency and thus backed by the full faith and credit of the U.S. government) or Fannie Mae/ Freddie Mac (publicly owned but government-sponsored enterprises that are considered to possess implicit government backing). The simplest and most popular mortgage-backed securities are called "pass-throughs", and they entitle investors to a pro-rata share of all principal and interest paid on a basket of similar mortgages.

Pools of agency-backed mortgages may also be formed and owned by special purpose vehicles, known as collateralized mortgage obligations (CMOs), which seek to mitigate the uncertainty inherent in MBS — primarily prepayment risk — by redirecting risk among various "tranches" of securities, each with different maturities, payment schedules and risk/return characteristics. Mortgage derivatives have become a classic arbitrage-based alpha-generating asset class, and the market's ongoing need to distribute, price and digest prepayment risk makes them a viable investment vehicle over the long run.

Figure 1. Mortgages Are Among the Largest Segments of the U.S. Bond Market



Source: Securities Industry and Financial Markets Association

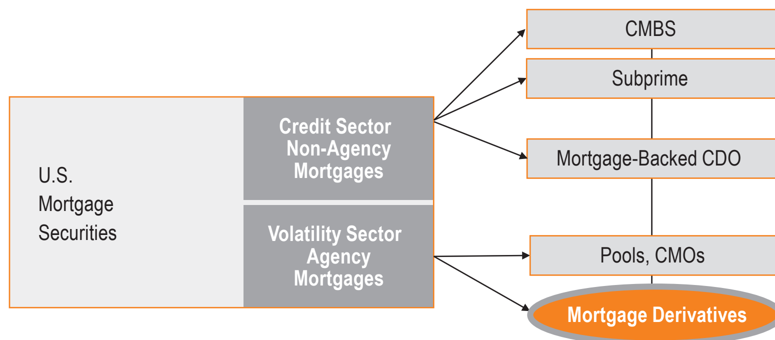
Prepayment Presents a Risk to Mortgage Investors — and a Source of Excess Returns

Credit risk — the risk that a borrower will fail to make the required payments on a debt — impacts many types of fixed income investments, including non-agency mortgages. Agency mortgage-backed securities, however, effectively are immune from credit risk given that the payment of interest and principal is guaranteed by the aforementioned government or quasi-governmental agencies. (As a result, these securities are frequently referred to as the "volatility sector" of the mortgage market as distinct from the "credit" sector.) With credit risk out of the picture, prepayment risk is the defining characteristic of agency MBS and distinguishes them from other major fixed income asset classes. Prepayment risk is the risk that a mortgage will be paid off in advance of its maturity date, thus making the yield to maturity uncertain. Furthermore, this acceleration of cash flows often leaves MBS investors forced to reinvest the assets from these retired loans at lower prevailing interest rates.

Homeowners typically have the right to prepay the principal on their mortgages at any time, and there are a number of reasons why they may choose to do so, from a desire to refinance at a lower rate to a change in family circumstances to a homeowner default that is covered by government guarantee. Moreover, the rate at which homeowners choose to prepay their mortgages is a function of a large number of contributing factors, including interest rates, home prices, demographic trends, lender competition, underwriting standards and changing regulations, to name only a few.

Governed as it is by a confluence of social and economic factors, prepayment analysis is far from an exact science. Because of the difficulty in pricing and managing prepayment risk, agency mortgages typically are issued and trade at a positive yield spread to Treasuries and swaps. While many investors are attracted to this advantageous spread, they may also be either unequipped or unwilling to take on the prepayment risk inherent in these securities. Mortgage derivatives enable such investors to pay someone else to bear that risk. What's more, this activity has a societal benefit as well; investors willing to digest the prepayment risk facilitate broader participation in the mortgage market, thus reducing the cost of housing.

Figure 2. A Number of Financial Instruments Compose the Mortgage Market

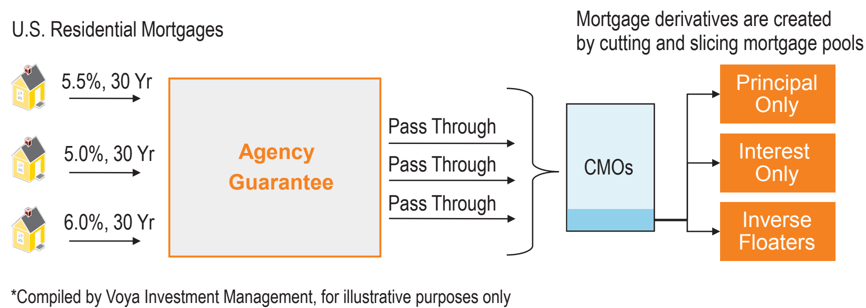


Source: Securities Industry and Financial Markets Association, Voya Investment Management

"Tranching" of Agency Mortgages

Mortgage derivatives are not "derivatives" in the usual sense of the word. Rather than synthetic instruments, they are cash securities that typically pay the monthly pro-rata share of principal and/or interest payments made by borrowers in the underlying pool of mortgages. These pools of mortgages are divided in different "tranches", each with its own characteristics in terms of coupon, yield and average life and thus with varying risk/return profiles to meet the preferences of different investors. For example, Figure 3 illustrates how loans to U.S. homeowners are combined to create residential mortgage pass-throughs which are then tranched to become CMOs, the residual tranches of which are the mortgage derivatives securities such as principal-only (PO), interest-only (IO) and Inverse Floater (IIO).

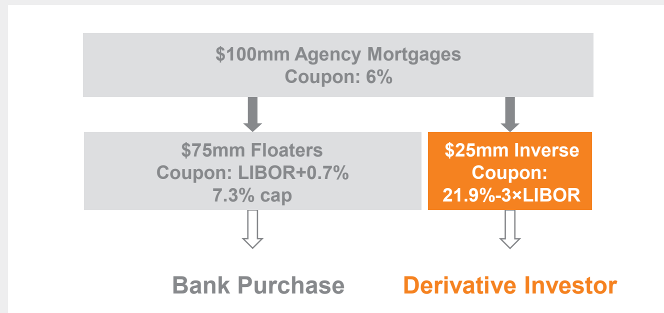
Figure 3. Mortgage Derivatives



*Compiled by Voya Investment Management, for illustrative purposes only

Source: Voya Investment Management

Mortgage Derivatives: An Example



In the example above, a $100 million fixed-rate mortgage pass-through security is tranched into two types of mortgage derivatives:

- A $75 million floater with a coupon of LIBOR + 0.70%
- A $25 million inverse floater with a coupon of 21.9% – (3 × LIBOR)

In terms of the structure of the derivatives, note that the cash flow coming in needs to equal the cash flow being paid out. Thus, $75 million × (LIBOR + 0.7%) + $25 million × (21.9% - 3 × LIBOR) = $100 million × 6%.

Since floater prices are relatively stable, the inverse absorbs the risk and reward of the original pass-through. The $25 million inverse floater is absorbing the prepayment risk of a $100 million collateral pool. Thus, an inverse is like a levered purchase of a mortgage pass-through with superior funding.

Quantifying Mortgage Prepayments

As suggested previously, prepayments are driven by a complicated interplay between interest rates, borrowers' ability to refinance and borrowers' eagerness to refinance. Historically, interest rates were the dominant driver, and models were developed to capture the relationship between prepayment rates and interest rates and to hedge those prepayments. Models, of course, are fallible — even more so in the case of a market so shaped by human behavior as mortgages. The difference between model and market consensus assumptions about prepayment speed and realized prepayments is the main risk that mortgage derivative investors take and for which they are compensated. The absolute level of prepayment speeds does not matter if it is priced in and hedge-able.

As with any other security, objective research and avoidance of herd mentality can reveal under- and over-valued assets and thus opportunities for substantial profits. By carefully studying borrower characteristics, managers seek to formulate a more accurate prepayment prediction than the general market. Certain types of mortgage derivatives, like interest-only, inverse interest-only and principal-only derivatives are very effective instruments through which to express mortgage prepayment views. In the example in Figure 4, this IO vintage 2006/07 purchased at 3 6/32 had a market expected constant prepayment rate (CPR) of 30 to 35, meaning the market expected that about one-third of the underlying mortgages in the pool would prepay every year for the remaining life of the security. Had this been correct, the IO would have yielded approximately 10% (the average of 15.19% and 6.11%) and had a weighted average life (WAL) of 2.5 years (the average of 2.7 and 2.26). In actuality, this IO experienced a CPR of only 10 — much lower than the market expected at the time of purchase — and as a result yielded approximately 45% over a WAL of 7.5 years!

Figure 4. Alpha Opportunities in Mortgage Prepayments Can Be Lucrative

Yield to Maturity							
Price	5 CPR	10 CPR	15 CPR	20 CPR	25 CPR	30 CPR	35 CPR
3-06	52.20	45.50	38.52	31.21	23.48	15.19	6.11
WAL	11.10	7.48	5.41	4.14	3.30	2.70	2.26
		Actual				Market Expected	

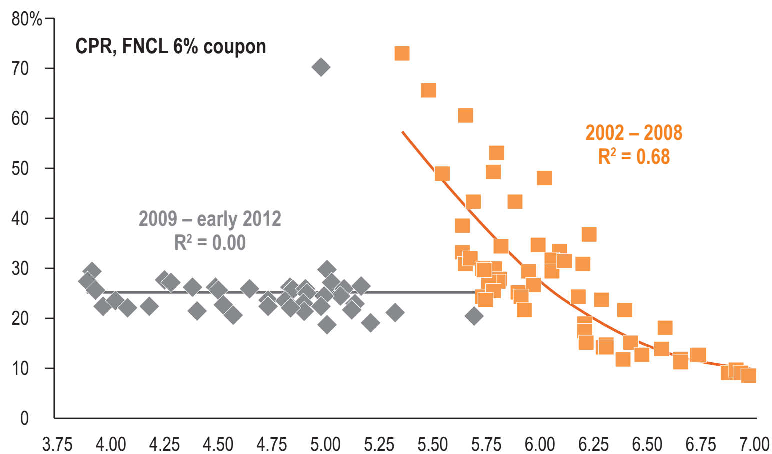
Source: CPRCDR, Voya Investment Management

The New Prepayment Phenomenon

Since the credit crisis, the correlation between interest rates and prepayments has broken. As a result, prepayment models that many market participants had relied upon pre-crisis are no longer effective. Figure 5 shows a linear regression between interest rates and prepayments for the same security before and after the credit crisis. Through 2008, the R-square correlation of interest rates versus prepayments showed an explanatory relationship of almost 70%. From 2009–12, this correlation dropped to zero.

Thus, we can see that mortgage prepayment drivers vary over time. The financial crisis introduced new dimensions into mortgage prepayments, creating an environment of uncertainty — and rich opportunities. For large segments of the mortgage market, prepayments are primarily driven by borrower characteristics, government programs and servicer behavior rather than interest rates.

Figure 5. Interest Rates and Prepayments Have Decoupled



Source: CPRCDR, Voya Investment Management

Capturing the Investment Opportunity Through Diversification

The mortgage market is extremely fragmented. Mortgage pools have varying exposures to the economy, housing, interest rates and government uncertainty. Some pools are driven by borrower characteristics, focusing, for example, on Puerto Rico loans or reverse mortgages. Such diversification of the sources of mortgage prepayment risk allows for effective risk control. By constructing a portfolio with many different types of mortgages with different prepayment drivers, managers can limit exposure to any particular risk. Diversification is the key to monetizing the relative cheapness of the sector while keeping overall risk well under control.

Outlook for Future Opportunities

In terms of yield as a function of credit risk, the mortgage derivatives sector is one of the cheapest in the fixed income universe. Prepayment uncertainties and rate moves can cause market dislocations, and the absence of prepayment consensus among market participants gives rise to opportunities that are identifiable through relative value analysis. Models are always backward-fitted and rarely get future prepayments correct, especially at the individual security level. As we transition into a new prepayment environment, models will likely be wrong again, leading to attractive investment potential.

There are a number of developments suggesting that we may be entering a new prepayment landscape:

- Home prices have been recovering nationally, but are diverging among local markets. Meanwhile, banks are still learning from the last housing crisis and retooling their lending platforms. As home prices increase and lending standards loosen, voluntary prepayments should increase while delinquency and default-related prepayments should decline. As such, turnover rates of different types of mortgages could differ significantly from their historical patterns — discrepancies that have yet to be priced in by the market.
- The government's conflicting influence on housing markets should continue to play out. Government guarantee fees have been rising and will likely continue to increase. Existing refinancing programs — such as the Home Affordable Refinance Program — will eventually sunset. The conforming loan limit should drop, and risk-based pricing by the agencies and Federal Housing Authority should intensify.
- Finally, long-planned reforms of government sponsored enterprises (Freddie Mac/Fannie Mae) and regulatory changes are only starting to take shape and will likely have far-reaching impact on the lending and prepayment picture.

Diversification Benefits

The risk in mortgage derivatives portfolios can be managed such that conventional credit or duration risks are not the primary drivers of return. While no generally recognized benchmark exists to serve as a proxy, Voya Investment Management has managed such a risk-controlled strategy since 2005, and the historical return series can aid in understanding the potential diversification advantages. As illustrated in Figure 6, the mortgage derivatives return correlation with fixed income, equity and alternative indexes suggests significant potential diversification benefits when added to broadly diversified portfolios.

Figure 6. The Voya Mortgage Derivatives Strategy Has Exhibited Low Correlations With Major Market Indices

Index	Correlation 1/2005-3/2014
Russell 3000 Index	0.17
Russell 1000 Index	0.17
Russell 2000 Index	0.16
Russell 1000 Growth Index	0.20
Russell 1000 Value Index	0.14
Barclays U.S. MBS Index	0.07
Barclays U.S. Aggregate Bond Index	0.12
Barclays U.S. Short Treasury Index	–0.17
Barclays U.S. Intermediate Treasury	0.02
Barclays U.S. Long Treasury Index	–0.09
Barclays U.S. Treasury Index	–0.03
Barclays U.S. Credit Index	0.20
Barclays U.S. High Yield Index	0.32
MSCI AC World Index	0.18
MSCI Emerging Market Index Local	0.20
MSCI EAFE Index Local	0.16

Index	Correlation 1/2005-3/2014
S&P 500 Index	0.17
S&P GSCI Index	0.12
CBOE Short VIX Futures Strategy Index	0.18
U.S. Dollar Index	–0.08
HFRI Fund Weighted Composite Index	0.20
HFRI Fund of Funds Index	0.18
HFRI Relative Value Multi-Strategy	0.29
HFRI Convertible Arbitrage	0.31
HFRI Relative Value Asset-Backed	0.33
HFRI Relative Value FI Corporate	0.33
HFRI Relative Value Yield Alternatives	0.29
HFRI Macro	0.03
DJ CS Long Short Equity Hedge Fund	0.16
S&P North American Natural Resources	0.11
DJ UBS Commodity	0.15
Barclays CTA	–0.01

See performance disclosure. For illustrative purposes only. **Past performance does not guarantee future results.**

Source: FactSet, Voya Investment Management

Conclusion

The mortgage derivatives asset class has historically been priced attractively on a risk-adjusted basis, and in our view, nothing has changed. Just as every mortgage (borrower, house, etc.) is different, so too is every mortgage derivative. As a result, investors, analysts and models produce a variety of forecasts for prepayments, giving rise to potential opportunities. Investors willing to look beyond the standard model results, especially during times of transition, gain a competitive advantage. The diverse, idiosyncratic and perpetually changing nature of mortgage prepayments offers a chance for persistent returns throughout the market cycle.

Moreover, active managers who are able to identify alpha potential and diversify away the idiosyncratic risks can potentially produce higher returns than most fixed income managers with little or no exposure to the duration and credit risk that dominate other fixed income asset classes. As a vital social service that satisfies the market's need to digest prepayment risk, mortgage derivatives are a viable asset class and can offer attractive diversification benefits in broad portfolios.

Performance Disclosures

Correlation was calculated based on actual and pro-forma performance of the Voya Mortgage Derivative Strategy, net of management and performance fees. Performance prior to January 2011 is based on the performance of a proprietary account managed by the same portfolio team, adjusted for fees and estimated expenses, which employs a similar investment strategy without external leverage.

The indices cited are unmanaged and not available for direct investment.

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General Risk(s): All investments in bonds are subject to market risks. Bonds have fixed principal and return if held to maturity, but may fluctuate in the interim. Generally, when interest rates rise, bond prices fall. Bonds with longer maturities tend to be more sensitive to changes in interest rates.

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There are no guarantees a diversified portfolio will outperform a non-diversified portfolio.

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