Spring 2019

FIRST PRINCIPLES QUARTERLY

First Principles Capital Management, LLC

First Principles Capital Management is an investment management firm with expertise across the global fixed income securities and derivatives markets. The firm provides highly customized investment portfolios for its clients, which include prominent endowments and foundations, financial institutions, industrial corporations, pension funds, family offices and trusts.

The investment team has extensive experience and a noteworthy history of innovation in the debt capital markets. The investment process and client service model is founded on the principle that it is necessary to gain an understanding of client-specific objectives, constraints and idiosyncratic factors in order to design and execute on the optimal strategy for each client. The orientation of the team facilitates a continuous relative value assessment within and across fixed income asset classes.

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FIRST PRINCIPLES QUARTERLY

CIO LETTER

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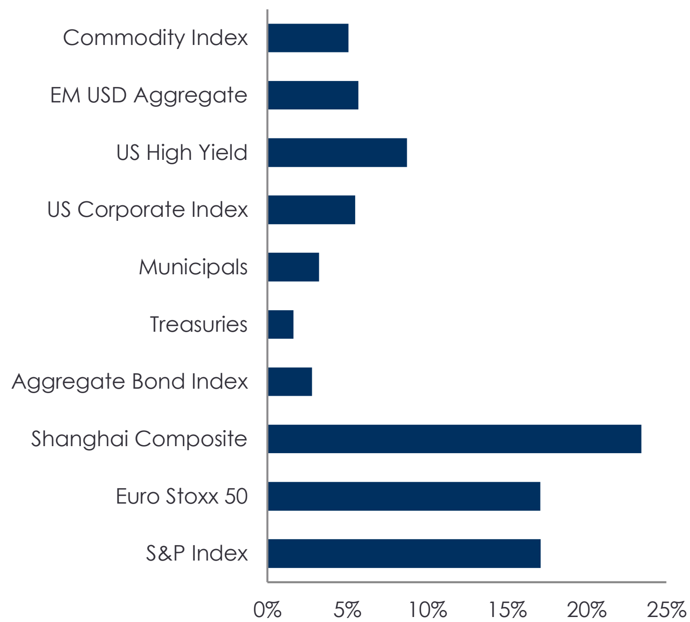
If It Ain't Broke…

The inordinate reliance on central bank accommodation by the financial markets is evident, and reinforced, by the performance of risk assets in 2019. Nearly all have retraced or surpassed the levels realized before the violent sell-off in the fourth quarter of 2018 after a decidedly dovish turn by developed markets central banks (e.g., Fed, ECB, BOC, BOI) in response to the perceived decline in global growth prospects.

Chart 1: YTD asset performance



Source: Bloomberg

Given the imminent -- over next twelve months -- transition from a patient posture to an easing bias, the open question is whether the current FOMC can deftly engineer a shallow recession in the face of increased politicization of the Federal Reserve; a likely profound change to price stability measurement and management, as the current target has failed to be met for roughly seven years; and limited monetary capacity (low short-term rates and a swollen balance sheet).

Past is prologue

In his well-respected, monumental tome (2000 pages) *A History of the Federal Reserve*[1,2], Professor Meltzer suggests there are two preeminent reasons that characterize policy errors at the Federal Reserve -- and he alludes to many such errors. They are "political interferences or pressure and mistaken beliefs" and he rails against the Fed for exercising too much discretion. He argued that one or both of these were responsible for the Great Depression, Great Inflation, and the Great Financial Crisis in particular.

Conversely, he concluded that the most successful periods of monetary policy (Disinflation period and the Great Moderation) were characterized by: (1) disciplined, rule-like behavior and (2) an absence of short-termism in terms of responding to data and/or exogenous events.

The capricious behavior of the FOMC in the fourth quarter was completely at odds with the predictable and methodical strategy articulated for quantitative tightening (gradually increasing short-term rates and reducing the size of the balance sheet) in the preceding three quarters. What changed? The consensus view is some combination of: (1) expectations of slower global growth, (2) fear that financial conditions had tightened substantially, (3) angst over the continued sluggish inflation outlook given growth and employment, (4) concern about the pace of decline of reserves in the banking system, and (5) political pressure to provide further accommodation.

This migration from a disciplined policy normalization approach to its current patient approach on rates, acknowledged frustration about satisfying the price stability mandate, greater sensitivity to current data/forecasts, and the partisan assault on Fed policies suggests, perilously, that the chances for a policy error are growing if Melzer's analysis is applicable in 2019/20.

Inflation conundrum

There is more than a hint of collective hand wringing at the Federal Reserve over the inability of the economy to sustain the 2 percent inflation target since the policy was formally announced in 2012. The apprehension around persistently below-target inflation is twofold. First, it erodes the Federal Reserve's credibility (its preeminent asset), which will ultimately inhibit its ability to conduct effective monetary policy prospectively. Secondly, long-run expectations may be anchored at a lower rate thereby raising real rates, which would weigh on the impact of monetary stimulus in a downturn. Heady stuff indeed!

As such, it appears as if the Federal Reserve is coalescing around making substantive changes to the price stability framework. The first salvo was the introduction of the "Committee's symmetric 2 percent objective over the medium-term" terminology in the May 2018 FOMC Statement. Although never explicitly stated, most regarded the target as a limit -- the ECB, on the other hand, defines price stability as inflation below 2 percent. That is, the FOMC would not be compelled to act if inflation exceeded 2 percent. This tweak in the statement indicates that breaching the limit will not necessarily elicit a policy response. Subtle, but clearly meant to support inflation expectations.

A bolder and infinitely more complicated change to the inflation framework making the rounds in monetary policy circles (e.g., Bernanke and Federal Reserve Bank of New York President Williams) is the concept of price-level targeting[3,4,5]. Quite simply, the FOMC would seek to achieve the inflation target on average over a fixed period. Periods of low inflation would be offset by the FOMC tolerating periods of above target inflation. Theoretically, this ensures long-run expectations remain anchored at the policy target but allow short to medium-term expectations to exceed the target.

If the lookback period were to start in 2012, the current shortfall between the 2 percent policy goal and realized inflation is in excess of 3 percent. It would thereby require nearly 5.5 years of realized Core PCE at 2.5 percent to converge back to the desired price-level.

[1] https://www.press.uchicago.edu/ucp/books/book/chicago/H/b o3634061.html

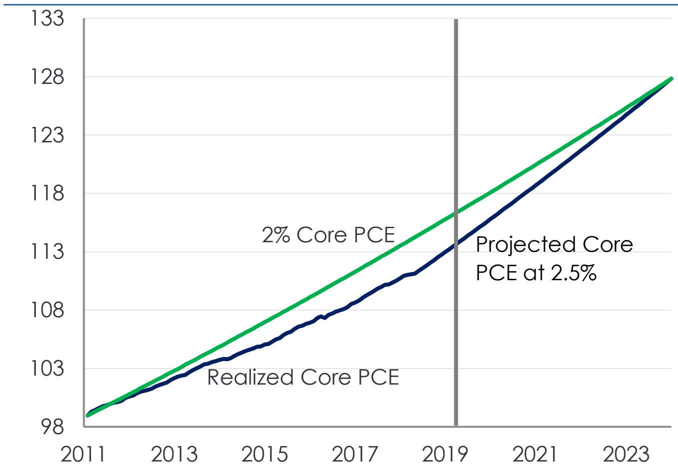
[2] https://www.press.uchicago.edu/ucp/books/book/chicago/H/bo5810549.html

[3] https://www.brookings.edu/blog/ben-bernanke/2017/10/12/temporary-price-level-targeting-an-alternative-framework-for-monetary-policy/

[4] https://www.frbsf.org/economic-research/publications/economic-letter/2017/may/preparing-for-next-storm-price-level-targeting-in-low-r-star-world-speech/

[5] https://www.brookings.edu/blog/ben-bernanke/2019/02/21/evaluating-lower-for-longer-policies-temporary-price-level-targeting/

Chart 2: Core PCE index and 2% YoY growth



Source: Bloomberg

Although conceptually straightforward, the communication and crafting of the framework for implementation is not at all trivial. Would the policy be temporary (low rate environments) or permanent? What would be the appropriate time horizon for averaging (lookback period)? Would spikes in inflation (overshoots) be tolerated if the price level had not been attained?

As announced in February, the Federal Reserve is undertaking an ad hoc review[6] of the monetary policy framework this year. The review -- augmented by "Fed Listens" town hall forums and a research conference in June -- is meant to be "wide ranging," but the Federal Reserve has specified three questions that it would like to address. The first question is: "Can the Federal Reserve best meet its statutory objectives with its existing monetary policy strategy, or should it consider strategies that aim to reverse past misses of the inflation objective?"

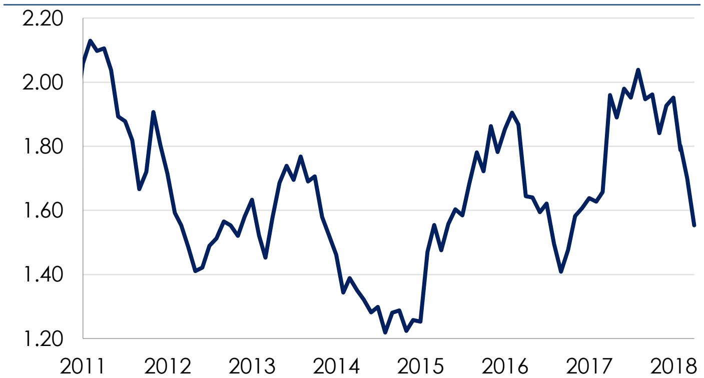
The Federal Reserve anticipates that the review will be concluded and made public in the first half of 2020.

Illusion of control

Core PCE has grown at roughly 1.6 percent per annum since 2012 – 0.40 percent below the stated policy rate. With the exception of 2015, wherein the commodity complex suffered a dramatic sell-off, the inflation rate has mostly been in the range 1.5 – 1.8 percent. Not at target but certainly not unstable. As the Federal Reserve embarks on the policy review, hopefully they will be cautioned of the following:

1. There is no theoretical justification for 2 percent inflation as representative of price stability.
2. The preferred measure is just one (complex) estimate of price inflation.
3. The limited tools of monetary policy are too blunt to precisely engineer relatively small changes in consumer prices.

Chart 3: Core PCE YoY



Source: Bloomberg

The deliberate, inclusive, and transparent approach to the monetary review is laudable and well-timed given that the economy is strong, unemployment historically low, inflation stable, and outlook benign. Although the substance of the first question intimates that price-level targeting is already being given serious consideration as a new policy tool, one hopes that a more measured, nuanced approach to achieving the price stability mandate is initially adopted, as the consequences of revising the framework so radically are elusive.

Although Professor Meltzer was a strong advocate of rule-based monetary policy, history suggests that he would reject such radical innovation until more conventional -- and preferably empirically tested -- revisions to the framework were exhausted. After a decade of unorthodox monetary policy, The Federal Reserve may be well served to proceed cautiously and apply the principle of Occam's razor when adapting the monetary policy framework.

[6] https://www.federalreserve.gov/newsevents/speech/files/clarida20190222a.pdf

MUNICIPALS

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QUICK READ

- Munis rallied versus Treasuries in Q1 2019, aided by retail demand, limited supply, and the cap on SALT deductions
- Evaluating state pensions is key to assessing a state's financial health
- Munis are at their richest level versus Treasuries in more than 20 years
- Treasuries are more attractive than are Munis for maturities seven years and less

Municipal bonds see strong demand Q1

Municipal bonds rallied more than one-for-one with Treasuries over the first quarter of 2019. Observable by AAA Bloomberg General Obligation Bond (AAA GO), muni yields decreased by 36 basis points (bp), compared with Treasuries' rally of only 25bps over the same period. Significant inflows from retail investors were a tailwind for the first quarter muni rally.

Deep discount at the Kentucky Teachers' Pension

We perform a comprehensive cash flow analysis on each state instead of relying on credit ratings when gauging the financial health of a state for investment, considering factors such as: debt levels, tax rates, demographics, oil price, etc. Further -- one of the major components of any state-level analysis is the health of its pension plans -- we look at not only the funded ratio of a state's various retirement plans, but also the state's absolute funding gap and trend.

For example, our updated financial analysis on Kentucky's pension plans revealed that its Teachers' Retirement System's ("the System's") net liabilities were sharply reduced from fiscal year 2017 to 2018. For fiscal year 2018, the aggregate pension deficit for the System was $28.6bn. This was an approximately $14.3bn improvement from fiscal year 2017. Most of that improvement was due to a roughly $13.3bn reduction in the projected total pension liability for the System. It is very unusual for a pension's net liability to change by such a large amount from year to year unless there were major contractual changes or significant planned contribution increases.

Upon further investigation, we discovered that the System had changed the discount rate used in the actuarial valuation of its projected liabilities. Specifically, the discount rate increased from 4.49 percent in FY 2017 to 7.50 percent in FY 2018. Generally, as present values of long-term liabilities are very sensitive to discount rate fluctuations, such a dramatic increase in the discount rate -- as in the case of Kentucky -- would significantly reduce the System's funding shortfall.

Is such a large increase in the discount rate used by the Kentucky Teachers' Pension justified? According to Governmental Accounting Standards Board's (GASB) guidance, a public pension's liabilities should be discounted using a blended rate comprised of a discount rate for: 1) projected liabilities expected to be covered by current assets, and 2) projected liabilities not covered by projected assets. First, projected liabilities that are expected to be covered by projected assets are discounted using the long-term expected asset rate of return, which is typically above 7 percent for most pensions. Then, for projected liabilities that cannot be covered by projected assets, typically a much lower 20-year AA tax-exempt rate would be applied as the discount rate for these liabilities.

Kentucky Teachers' Pension justified the new, much higher discount rate by increasing the ongoing projected employer contribution. Given this assumption, there will be more projected assets in the pension plan to cover projected liabilities, meaning a higher discount rate for those covered projected liabilities. While technically valid, it does beg two important questions: 1) Why did Kentucky choose to underfund its pension for all these years? And 2) Does Kentucky have the fiscal discipline to actually implement the increased employer contribution going forward?

To offset the impact from transient accounting phenomena in our own financial analysis of Kentucky, we used the average pension funding figures for the past five fiscal years as inputs. Additionally, this will change materially only if there is a history of consistent changes.

Looking forward

Technicals for munis are currently strong, but fundamentals remain weak. Versus Treasuries, munis are at their richest level in more than 20 years -- a rally fueled by lack of supply and the limit on state and local tax deductions. Given this muni richness and our penchant for liquidity, we think clients who are interested in munis with maturities seven years and less are better off investing in US Treasuries at this time.

Spring 2019

FIRST PRINCIPLES QUARTERLY

RATES

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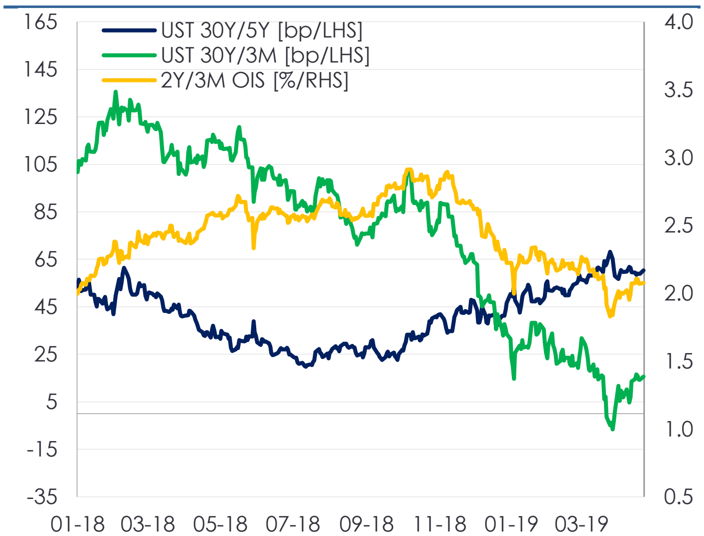
QUICK READ

- Rates markets were rangebound for most of Q1, until dovish March FOMC communique
- Easing financial conditions and suppressed volatility will continue to support risk assets
- The balance of likely conditions to hike vs cut are skewed toward cut, despite what the Fed says
- Rate policy, the SOMA portfolio, and clarity on "inflation averaging" will determine the path of rates
- The Fed is investigating ways to minimize quarter-end funding stress
- The Fed will utilize a slower and earlier end to unwinding the SOMA portfolio
- The market is eagerly awaiting more clarification on how the Fed will proceed with the notion of inflation averaging

FOMC leading the dole of doves

Fixed income markets were rangebound for most of the first quarter as risk assets extended the post-Christmas rally. Trade risks, Brexit headlines, and softening economic data combined with the Fed's new emphasis on patience were the primary factors behind the sideways trend. The market moving catalyst came with the March FOMC Meeting, as the Committee announced no policy rate moves in 2019 and the anticipated end of balance sheet run-off in September 2019. What followed was a blistering rally in rates, as 10-year rates broke the range and traded to levels not seen since December 2017. The Fed was not alone in the dovish camp, with the ECB also delivering a dovish message with downward revisions to its inflation and growth forecasts, and several other global central banks also joining the dole of doves (BoJ, BoE, RBA, RBNZ). Curve dynamics gathered attention toward the end of the quarter, as the spread between 3-month and 10-year Treasuries turned negative, igniting recession fears -- however, it steepened 10-15 basis points (bps) in April. The long end of the curve has steepened, as the market is now pricing approximately two rate cuts in the next two years.

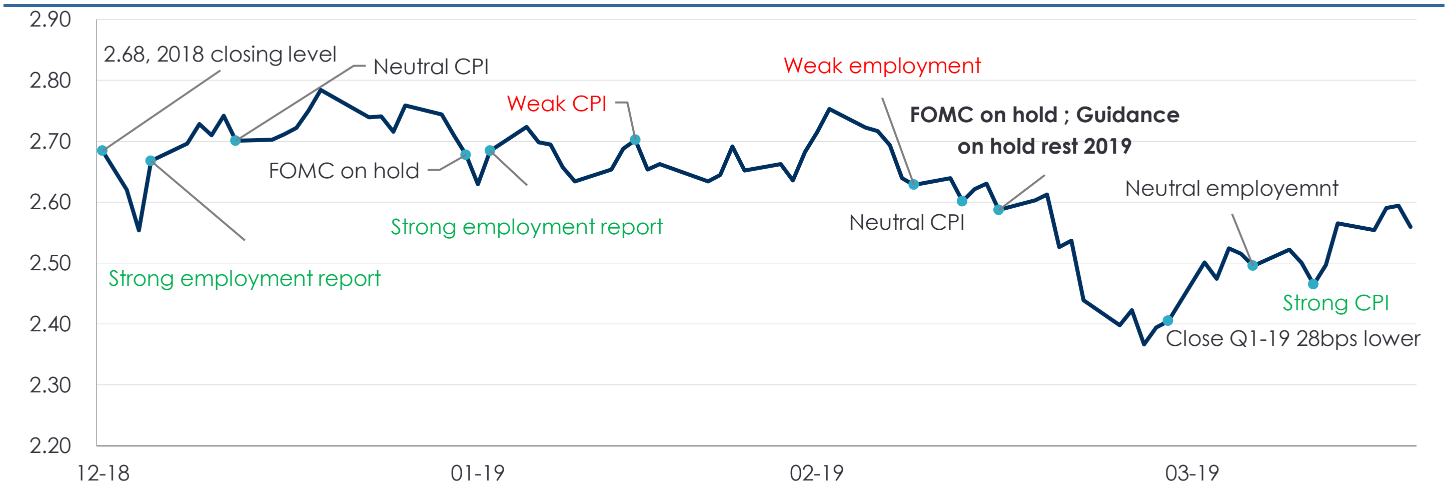
Chart 1: Curve steepening



Source: Bloomberg

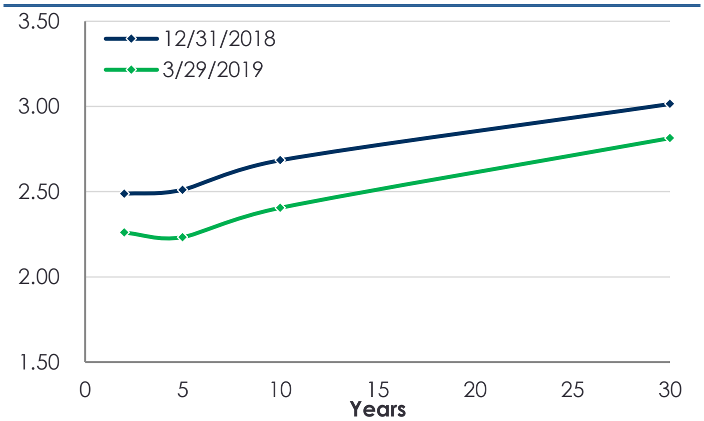
RATES

Chart 2: 10-year Treasury yields [%]



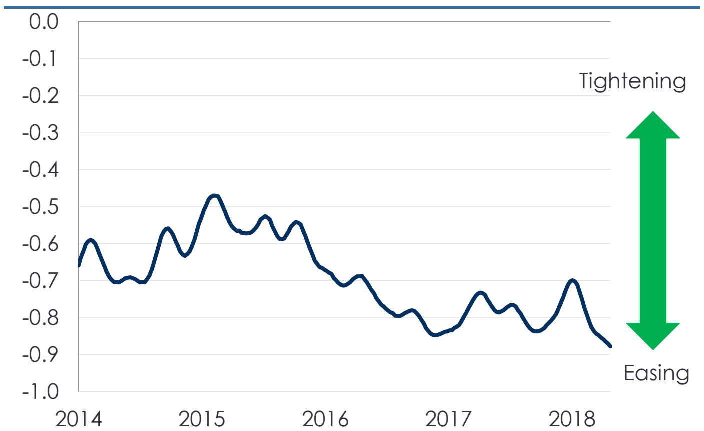
Source: Bloomberg

Chart 3: Treasury curves [%]



Source: Bloomberg

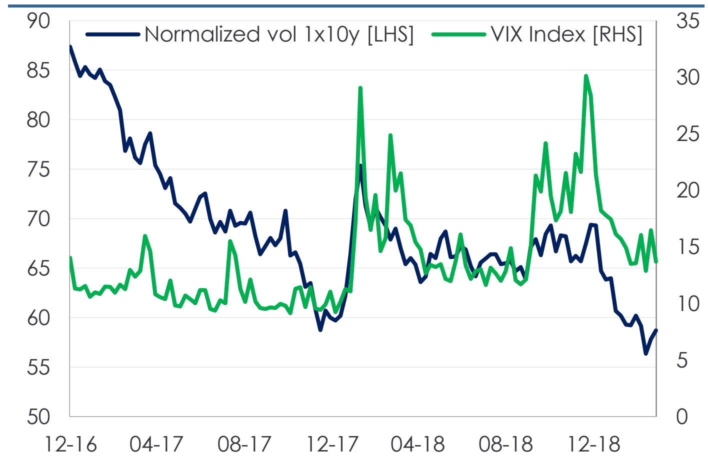
Chart 4: Chicago Fed financial conditions index



Source: Bloomberg

The Fed's commitment to sustaining this cycle's expansion should ease the market's concerns of overtightening financial conditions, as easing conditions have been a tailwind for risk assets. Volatility across markets decreased significantly post Q4's spike, especially interest rate volatility where technical and fundamental factors have caused volatility to reach historical lows.

Chart 5: Normalized vol vs VIX index



Source: Bloomberg

RATES

Pole vaulting for tightening vs hurdles for easing

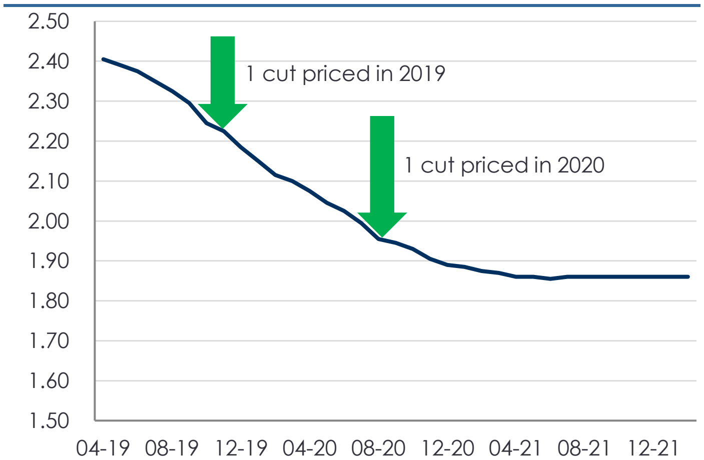
The FOMC has communicated that the future rate path is symmetric and highly data dependent, however the market perceives that the risks are not symmetrical.

The Fed has a higher bar to hike as a significant improvement on the inflation front is needed -- a task proven to be very challenging in recent history in the US and abroad. Additionally, the Fed's shift toward average inflation targeting may allow inflation to run above target for a period.

The hurdle to cut is much lower -- if inflation expectations decrease or if the economic outlook deteriorates significantly. The market is aware of this and has even speculated on the possibility of an "insurance cut." Currently, the market is pricing in a full cut in 2019 and another cut in 2020. Several positioning indicators show that the market is now biased towards long duration positioning.

We are watching and expect more clarification from the Fed on three themes related to Fed policy that could have significant impact on the rates market: 1) the Fed's ability to cap short term rates, 2) composition of the SOMA portfolio, and 3) the formal implementation of a new policy framework where past lower-than-target inflation would be made up with higher inflation in the future, known as "inflation averaging."

Chart 6: Futures implied Fed funds rate

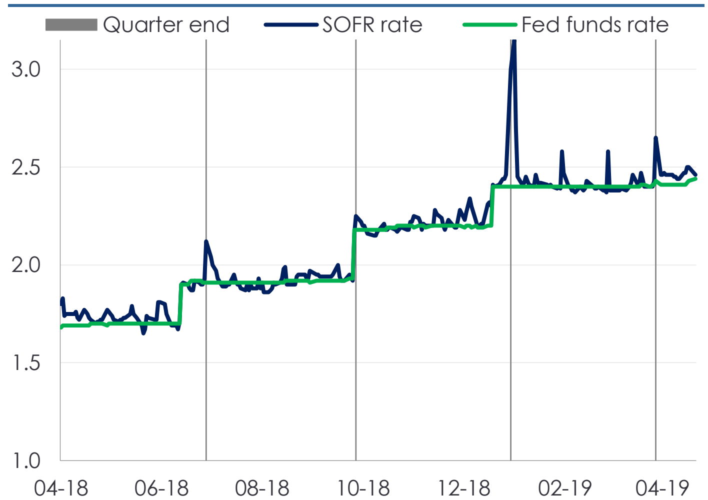


Source: Bloomberg

A window for short term problems

The December and March Fed meeting minutes revealed discussion around a measure to control upward pressure on money market rates (fed funds), however no details have been revealed on the actual mechanics of a facility. Dealers expect a "standing repo facility" (SRF) to be a form of stigma-free discount window borrowing that would allow banks to pledge Treasury collateral to the Fed and borrow reserves. At the turn of the year and quarter end, repo rates spiked significantly (Chart 7). Whilst an SRF could alleviate emergency reserve requirements for banks and mitigate large moves in repo that can translate into higher fed funds rates, it might not keep repo rates from surging at times when the balance sheet is scarce. The devil is always in the detail -- how will the Fed calibrate rates to avoid overuse and what will the balance sheet implication be for banks that use this? Potentially, this could be constructive for Treasuries relative to swaps as banks may be incentivized to hold Treasuries, as they could easily convert to reserves for the purpose of extreme stress scenarios.

Chart 7: Fed funds and SOFR at quarter end [%]



Source: Bloomberg

RATES

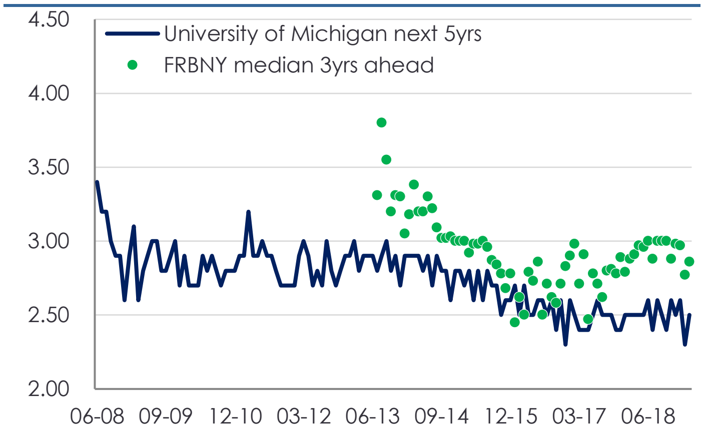
Composition of the SOMA portfolio

The Fed announced in its March meeting that the Committee was going to slow the pace of the decline in reserves in the coming quarters (subject to market conditions) in order to ensure a smooth transition to a regime of ample reserves -- necessary to implement monetary policy and ensure control of the federal funds rate. The Treasury run-off will be reduced to $15bn from $30bn a month beginning in May 2019 and cease by the end of September 2019. Additionally, principal payments from the MBS holdings will be reinvested in Treasury securities via secondary market purchases subject to a maximum of $20bn per month, consistent with the aim of holding primarily Treasury securities. The open question is the long run composition of this portfolio and how this could affect supply/demand dynamics in the market, given the debt issuance decisions of the US Treasury.

Great Expectations: inflation averaging

Inflation expectations have been declining in an environment of low neutral interest rates, and this has been a key area of interest for a few key FOMC Members: Vice Chair Clarida, NY Fed president Williams, and Boston Fed president Rosengren. They seem to be leading the review of the Fed's monetary policy framework arguing for the case of price level targeting, or average inflation targeting. Without going into the academic base of their argument, the premise is that average inflation targeting will raise inflation expectations and it would be particularly useful in the next downturn when the Fed will most likely be bound by zero interest rates. The Fed will have a significant challenge in educating the public on this new policy, and we expect that tools and communications will be a trending topic in the upcoming June conference on the Fed's strategies.

Chart 8: Inflation expectations [%]



Source: Bloomberg

MORTGAGE-BACKED SECURITIES

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QUICK READ

- Default rates are low, minimizing MBS investors' exposure to home prices
- Voluntary MBS prepayments typically increase/decrease as home prices rise/fall
- Investors in premium/discount MBS benefit from slower/faster prepayments, making it difficult to extract value from geographies that always have fast/slow prepayments
- NY state has consistently low prepayment rates due to mortgage recording tax, which results in NY pools being pooled separately and trading at a payup to generic mortgages
- NJ, PA, and VA are states with low prepayment rates that have not been priced into the market

Location, location, location?

Every real estate investor knows the old adage "location, location, location." Logically, this should not only apply to real estate, but also mortgages backed by real estate. However, looking at data from Fannie Mae and Freddie Mac, the impact of geography on mortgage-backed securities (MBS) is far from straightforward.

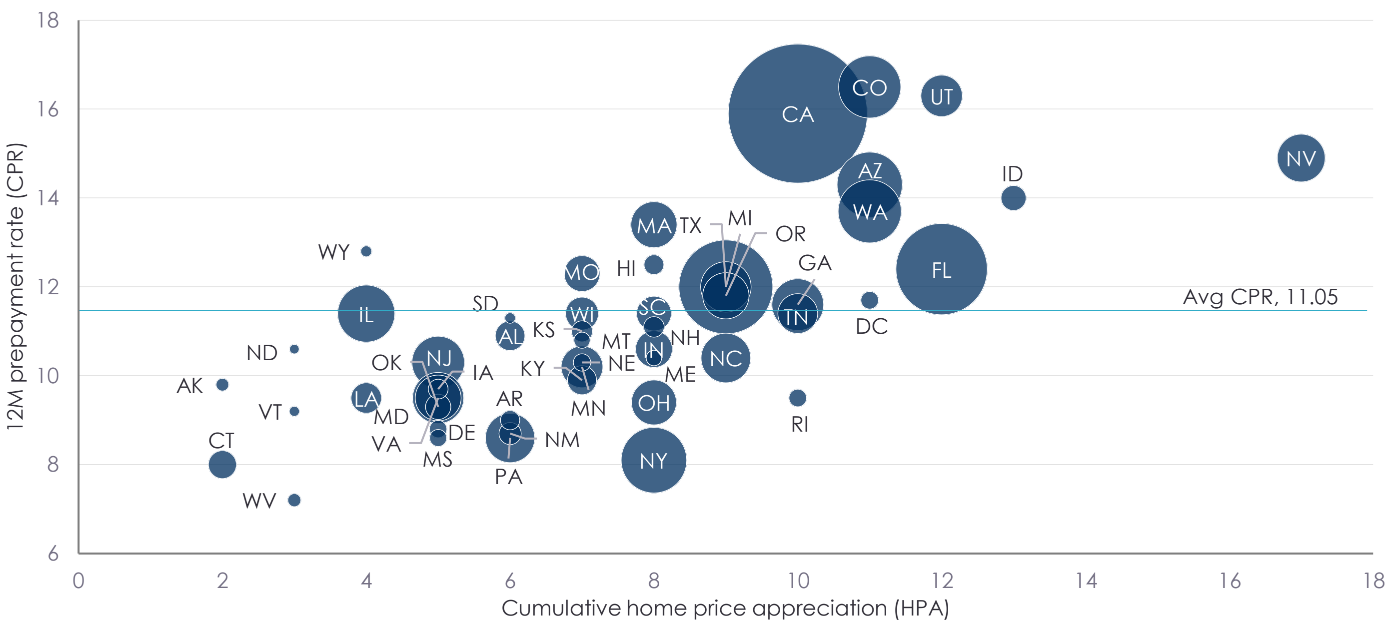
Overall, MBS investors are exposed to very little risk from falling property values. Loans are originated with approximately 25 percent down payments on average, requiring property values to fall meaningfully before borrowers would be at risk of defaulting on their mortgages. Further, principal balances on GSE-issued MBS are guaranteed (by government sponsored enterprises, Fannie Mae and Freddie Mac). When a borrower becomes seriously delinquent, the agencies buy the loan out from the mortgage-backed security, which shows up as a prepayment for investors. Over the past five years, these involuntary buyout prepayments have made up only 2.7 percent of total GSE MBS prepayments.

While there is very little incremental value gleaned from analyzing involuntary prepayments, geographies can have a large effect on voluntary prepayments. Below are two charts showing prepayments by state and home price appreciation for loans that have incentive to refinance[7] and for loans that do not[8].

[7] Loans which have at least a 20 basis point mortgage rate above prevailing mortgage rates.

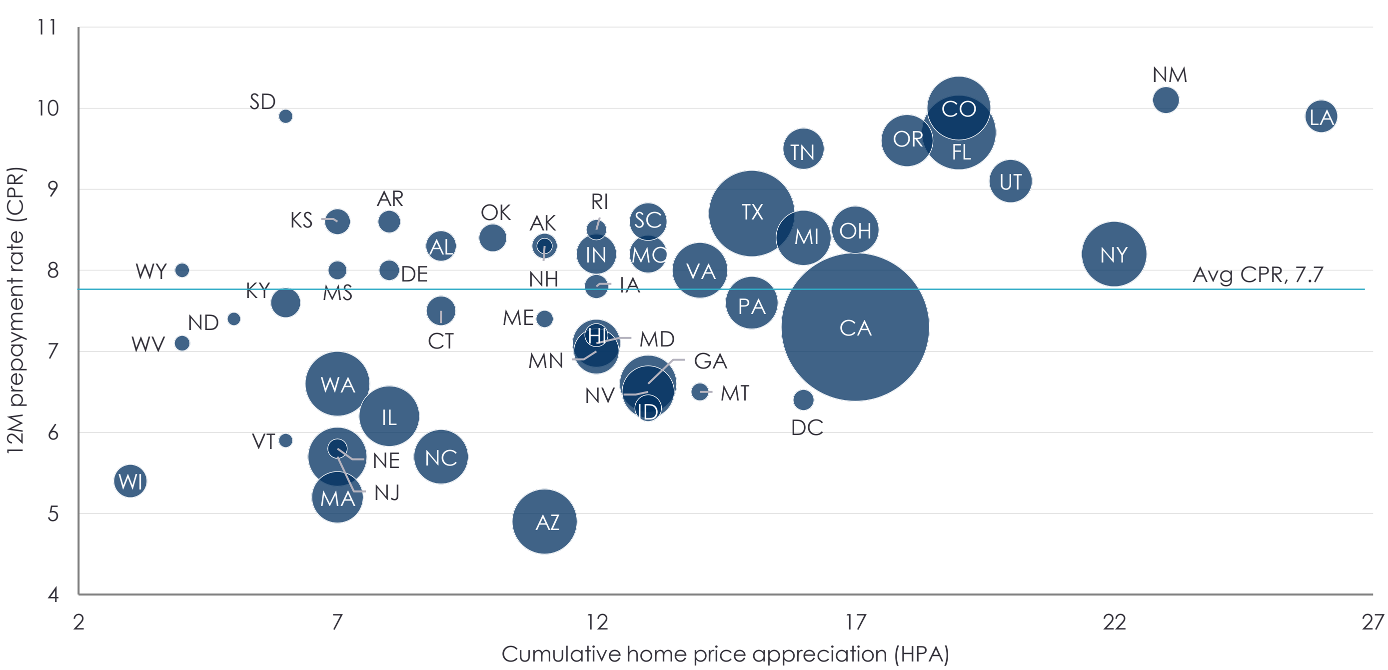
[8] Loans which have at least a 10 basis point lower mortgage rate than prevailing mortgage rates.

Chart 1: Moderately seasoned loans with at least 20bp incentive to refinance



Source: eMBS

Chart 2: Moderately seasoned loans with at least 10bp incentive to NOT refinance



Source: eMBS

Note: the size of the bubbles corresponds to the total size of loans in that state.

MORTGAGE-BACKED SECURITIES

Clearly, the greater the home price appreciation, the higher the prepayments -- irrespective of incentive to refinance. Unfortunately, things are not as simple for investors. When borrowers have an incentive to refinance, their loans trade at a premium to par (i.e. the balance they owe). When a loan is prepaid, it is done so at par, not the market price the mortgage trades at -- therefore investors prefer low prepayments on premium mortgages. Conversely, when borrowers have an incentive to not refinance, their loans trade at a discount to par, and investors prefer higher prepayments!

When we look at the differences between each of the top 20 prepayment states versus the average for all states, we notice that no states prepay ideally for investors -- quickly when there is no incentive to refinance and slowly when there is.

Chart 3: 20 largest states: state-average 12mo prepayments

		Incentive [CPR]	
% of mtg universe	State	Positive/premium	Negative/discount
18.8%	CA	3.4	-0.3
6.5%	TX	-0.5	1.1
5.6%	FL	-0.1	2.1
4.5%	NY	-4.4	-2.7
3.8%	IL	-1.1	-1.0
3.7%	WA	1.2	0.6
3.4%	VA	-3.0	-1.4
3.3%	CO	4.0	2.4
3.3%	NJ	-2.2	-1.9
2.9%	MA	0.9	-1.0
2.8%	PA	-3.9	-1.9
2.8%	NC	-2.1	0.4
2.7%	GA	-0.9	0.8
2.7%	AZ	1.8	2.0
2.6%	MD	-3.0	-2.4
2.5%	MI	-0.5	0.0
2.3%	MN	-2.3	-1.1
2.2%	OH	-3.1	-0.5
2.0%	OR	-0.7	0.9
1.7%	WI	-1.1	-0.6

Source: eMBS

Therefore, if rates move up or down, and an MBS switches from trading at premium to discount or vice versa, then having a unique geographic makeup in your MBS can go from helping to hurting! This dynamic also makes it difficult for originators to create MBS with unique geographic makeups. By definition, mortgages are originated at a market rate with no incentive to refinance or not refinance. Further, the typical mortgage in the US is a 30-year fixed-rate mortgage, which gives state housing cycles plenty of time to change, thereby altering the prepayments of a pool even when mortgage rates do not materially change.

NY state is a notable exception to this due to an onerous mortgage recording tax that often makes it uneconomical to refinance. For this reason, NY prepayments are always slow irrespective of their incentive to refinance. Market participants have picked up on this, and NY pools are typically pooled separately and trade with a payup to the rest of the market on premium pools of mortgages. However, the market has not priced in slower premium prepayment speeds for states like VA, NJ, and PA. The difficulty, of course, is locating pools with high concentrations of these states.

ASSET-BACKED SECURITIES

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QUICK READ

- With all the rage about ride-sharing upstarts like Uber and Lyft which completed IPOs recently, one naturally wonders how the rental vehicle business and related rental vehicle asset-backed securities (ABS) are doing.
- Quite well, surprisingly. The traditional vehicle rental and ride-sharing businesses serve two distinct segments, with limited overlap. It's like comparing fast food vs. self-prepared meals.
- Instead of becoming dinosaurs, the rental vehicle companies have adjusted their business models in various ways, such as connecting their vehicles to the internet and by forging partnership with ride-sharing companies.
- Rental vehicle ABS have strong and dynamic structural protection through overcollateralization and periodic marking-to-market (MTM) of rental vehicle collateral, which mitigates a key residual value risk.
- Unsurprisingly, rental vehicle ABS performance has remained strong since its debut over two decades ago, with no downgrades and no credit losses so far, even during recessions and when auto original equipment manufacturers (OEMs) filed for bankruptcy. We are optimistic that the rental vehicle ABS will continue to offer investors strong protection.

Rental vehicle ABS in the age of Uber and Lyft – doing well

With all the rage about Uber and Lyft in recent years, how are the rental vehicle business and ABS doing today?

Quite well, surprisingly. Since the advent of major ride-sharing firms Uber (2009) and Lyft (2012), there has been increasing speculation of traditional rental vehicle business being relegated to obsolescence. The fact has turned out quite differently. The two major vehicle rental companies (Avis Budget Group and Hertz Global Holdings) compete largely in separate business segments than ride-sharing firms. Avis and Hertz have also shown increasing flexibility in adapting to a changed transportation landscape by forging partnerships with ride-sharing companies. Performance of rental vehicle ABS remains strong since its debut over two decades ago, supported by strong and dynamic structural protection via periodic marking-to-market (MTM) of rental vehicle collateral. We are optimistic on the rental vehicle ABS and believe this asset class can handle the ups and downs of the evolving vehicle rental market due to the dynamic structural protection mechanism built in.

Vehicle rental and ride-sharing business serve two distinct segments

Both serve a transportation need. However, rental vehicles are generally rented for at least 24 hours (one rental day) by a business or leisure traveler for multiple rides or for a long trip. For example, a typical Avis rental is for a four-day contract with 450 miles driven. In contrast, ride-sharing typically serves a single ride for a shorter length trip. Tourists or business travelers often rent vehicles for the duration of their stay as this option provides more flexibility and is often more cost efficient than using ride-sharing as a primary source of transportation. In a sense, an Uber ride is like fast food while Avis is like an extended self-prepared meal. Both serve the same basic product, but their markets are segmented based on user preferences, time need, convenience, and cost consideration. According to Hertz's estimate, there is only a 10 percent overlap between the traditional rental vehicle market and the mostly urban short-haul market dominated by ride-sharing.

Partnership between rental vehicle companies and ride-sharing firms

The two segments are not necessarily mutually exclusive, and rental vehicle companies have shown flexibility in adjusting their business models in a changing landscape. For instance, Avis forged a partnership with Lyft in 2018, in which Lyft drivers in North America can use Avis vehicles on a monthly and weekly basis as an alternative to using their own personal vehicles. Hertz also has an agreement with Lyft as well as with Uber in which Hertz offers vehicles to the ride-sharing drivers on a weekly basis in various US markets. This kind of partnership helps the rental vehicle fleet's utilization rate. Furthermore, Avis already owns a car-sharing pioneer – Zipcar, which rents cars on an hourly basis and competes with ride-sharing firms.

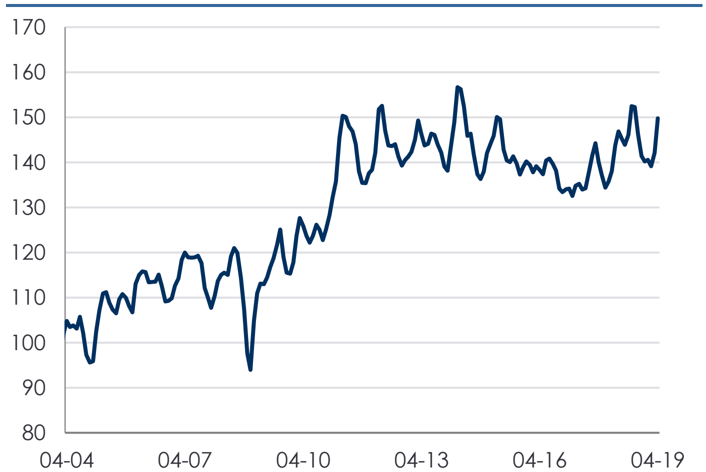
Robust and dynamic structural protection for rental vehicle ABS

Credit enhancement consists of: 1) over-collateralization by excess of borrowing base over the outstanding principal ABS notes; 2) subordination provided by lower classes. For AAA enhanced senior Class A notes, minimum credit enhancement is over 30 percent for recently issued Avis and Hertz deals. Actual required enhancement level is dynamic and varies based on the mix of vehicles (program vs. non-program) in the securitized fleet and the ratings of vehicle manufacturers for program vehicles (investment grade vs. high yield). Program vehicles require auto OEMs to repurchase vehicles at a specified price or guarantee its rate of depreciation during a specified time period, such that the auto OEMs bear residual value (RV) risk. Non-program vehicles, which are also known as "risk vehicles" and make up the majority of rental fleet in recent years, are subject to minimum monthly depreciation requirement as well as monthly residual value MTM tests. This MTM mechanism mitigates a key residual value risk for non-program rental vehicles, as it is used to increase the required enhancement and serves as dynamic protection against declining vehicle collateral market value and falling residual value realization upon vehicle disposition. The Manheim Rental Risk Pricing Index has stayed relatively stable since 2010. This index tracks the price of actual vehicles sold by vehicle rental companies at Manheim auctions, and therefore serves as a relevant gauge of approximate residual value realization upon disposition of non-program vehicles.

Performance of rental vehicle ABS remains strong, and is likely to stay strong

The first rated rental vehicle ABS was done in 1997 by Avis, but no rental vehicle ABS has been downgraded by Moody's since then. No credit loss has been incurred by rental vehicle ABS investors so far, even during the Great Recession when both GM and Chrysler filed for Chapter 11 bankruptcies in 2009 (for program vehicles, the key risk is when auto OEMs file for bankruptcy) and when used vehicle prices plunged in late 2008 and early 2009. This stellar performance during a severe nuclear winter situation is due to strong over-collateralization for both program and non-program vehicle collateral and periodic MTM requirements of non-program vehicles. However, given recent challenges in auto sales, one might wonder what could go wrong from here? What if the Manheim index tanks again? Well, the rental vehicle ABS structure has built in a dynamic mechanism to handle such adverse developments by requiring monthly MTM to mitigate the RV risk. As such, we are optimistic that the rental vehicle ABS will continue to offer investors strong protection, even as the rental vehicle industry evolves and faces potentially challenging conditions again.

Chart 1: Manheim rental risk pricing index



Source: Manheim (Index adjusted January 2003 = 100)