BLACK KNIGHT®

COVID-19:

Impact on the Real Estate and Mortgage Markets

SPECIAL BRIEFING

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EXECUTIVE SUMMARY

The COVID-19 pandemic has wide-reaching impacts for the U.S. and global economy. This paper seeks to assess and – where possible – quantify the specific impact to the U.S. housing and mortgage markets. We look at the current state of the market, key drivers of the pandemic on the housing and mortgage industries and drill down into potential effects and curative actions for varying market segments.

OVERVIEW

On March 11, 2020, the World Health Organization (WHO) declared the fast-spreading coronavirus outbreak to be a global pandemic. By mid-March, cases had been identified in all 50 states, and massive disruption to Americans' day-to-day lives had set in. Aside from the devastating effects on human life, the outbreak is already having considerable impact on employment, business, and the supply chain, with an increasing probability of profound impacts on the U.S. housing and mortgage markets.

Black Knight is a recognized leader in providing integrated software, data and analytics solutions across the homeownership life cycle. Powered by Black Knight's extensive property, home price and loan-level mortgage data, as well as our proprietary analytics, this report provides a comprehensive evaluation of the impact the COVID-19 pandemic – and its extended disruption to the market – may have on the housing and mortgage industries. In recognition of the growing disruption and deepening risk inherent in the current situation, the report also focuses on solutions and technologies that have the potential to help address the negative effects of the pandemic on these markets.

It should be noted at the outset that this is an incredibly fluid and dynamic situation, and underlying facts and assumptions in this report may need to be revisited as the true global, national and local impacts of the COVID-19 pandemic, and the nation's response, become more clear. There are, at present, far too many unknowns to have any true certainty regarding forecasted impacts.

KEY FINDINGS

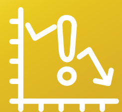
- COVID-19 and the nation's response to the pandemic are significantly affecting the real estate and mortgage industries
- Real estate showings, listings and sales are already being affected by social distancing and supply-chain disruption to closings
- Market and rate volatility are bringing uncertainty to the housing market, home affordability, refinance incentive and portfolio retention risk
- Rising unemployment rates have already resulted in a surge of COVID-19-driven forbearance requests and associated operational challenges, and increased mortgage defaults are likely
- Technology solutions exist to address many of the negative effects of the pandemic on the real estate and mortgage markets

TOP-LEVEL RECOMMENDATIONS

Parties across the real estate and mortgage continuum should be actively seeking automated technology solutions that can help as the industry shifts to accommodate today's reality

Black Knight offers digital solutions across the continuum to help real estate transactions and mortgage lending continue even with COVID-19 restrictions preventing face-to-face interaction

Black Knight servicing clients are uniquely situated to adapt to any potential default cycle by virtue of robust automation, loss mitigation and customer engagement tools



The company also provides extensive default, prepayment and retention risk modeling via a variety of data and analytics solutions as well as tools to improve recapture rates

STATE OF THE MORTGAGE MARKET

Coming into 2020, the mortgage market was in a historically positive – even record-setting – state from a performance perspective. Elevated credit requirements and overall pristine performance in the years following the 2008 recession had resulted in relatively continuous improvement across all mortgage performance metrics.

The U.S. national delinquency rate fell to its lowest point on record in January 2020, with the pace of improvement accelerating over the prior several months. Likewise, the total number of non-current loans (any loan 30 or more days past due or in active foreclosure) fell to its lowest point since March 2005.

Both serious delinquencies and new defaults were near record lows, while foreclosure starts hit their lowest point on record in February 2020. The number of loans in active foreclosure continued a years-long trend of improvement, and as of this February the national foreclosure rate was within a single basis point of its all-time low.

In addition, widespread home price growth since the market hit bottom in early 2012 had resulted in record levels of homeowner equity. The median home price was up an aggregate 54% over the previous 8 years with total debt on mortgaged U.S. residential properties entering 2020 equivalent to 52% of the associated homes' values.

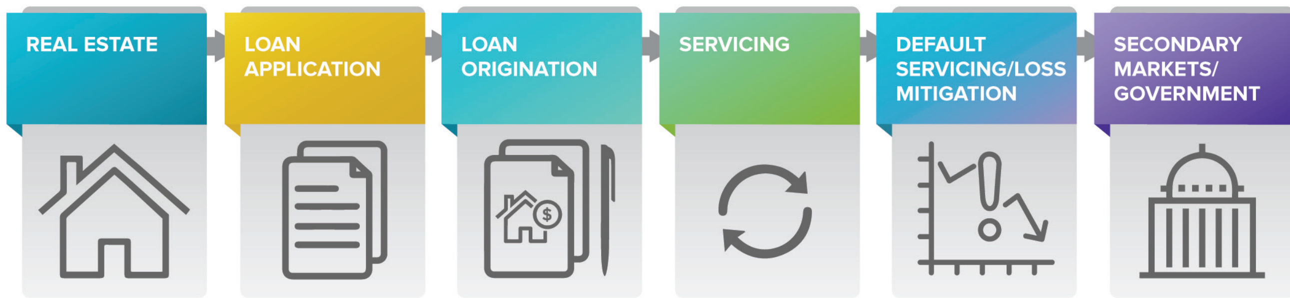
Together, this leaves a substantial buffer against the potential for falling home prices. Likewise, record levels of tappable equity – defined as the amount available to borrow against before reaching a maximum 80% loan-to-value (LTV) ratio – could be leveraged in part to offset temporary income losses, and mitigate the incentive for strategic defaults, a notable feature of the last recession.

Low interest rates and record levels of available equity helped spur a refinance surge in late 2019 and early 2020, with Q4 2019 refinance volume hitting a 6.5-year high. Cash-out refinances were at a 10-year high, as approximately 600,000 homeowners withdrew $41 billion in equity via refinancing – the largest such volume since mid-2009, but still less than 0.75% of total available equity in the quarter.

Mortgage originators were already transitioning from a low to a high refinance volume environment, and historically low rates in late February and early March 2020 only accelerated that trend. Refinance transactions accounted for 57% of all lending in Q4 2019. Early estimates have suggested that share will increase in Q1 2020. It remains to be seen what impact COVID-19 will have on the closings of refinance transactions already in play.

Black Knight estimates that 11 million refinance candidates remained in the market as of March 26, 2020, with the Freddie Mac Primary Mortgage Market Survey reporting the average 30-year rate at 3.5% as of that date.

Potential COVID-19 Impact Points in Real Estate/Mortgage Process.



KEY DRIVERS OF COVID-19 IMPACTS

As of mid-March, the U.S. federal government had issued recommendations calling for extensive social distancing to help prevent the spread of the novel coronavirus. To the extent possible, many businesses have shifted their workforces to work remotely. Retail and service industry businesses have seen markedly decreased traffic, and in many cases have been ordered to close for an undetermined length of time.

By the third week in March, unemployment claims had begun to spike. Early decisions by California, the tristate New York metropolitan area and Illinois state governments to impose shelter-in-place orders on their populations were soon emulated by other states. As of this writing, 28 states are now in or will be entering some form of lockdown.

Of course, the risk of rising unemployment and/or that of a broader economic shutdown is substantial. Estimates on the economic impact of the pandemic vary. On Friday, March 20, Goldman Sachs issued a research paper suggesting a sharp pullback (-10%) to gross domestic product (GDP) in April, along with increases in unemployment rates to as high as 9% in Q2 2020. By March 31, that projection had been increased to 15% unemployment and a 34% reduction in GDP. Early on, U.S. Treasury Secretary Steven Mnuchin had publicly warned that – absent massive government intervention – the impact could be even more severe, with an unemployment rate as high as 20%. On Sunday, March 22, Federal Reserve Bank of St. Louis President James Bullard predicted U.S. unemployment may hit 30% in Q2 as a direct result of COVID-19-related shutdowns and as much as 50% drop in GDP.

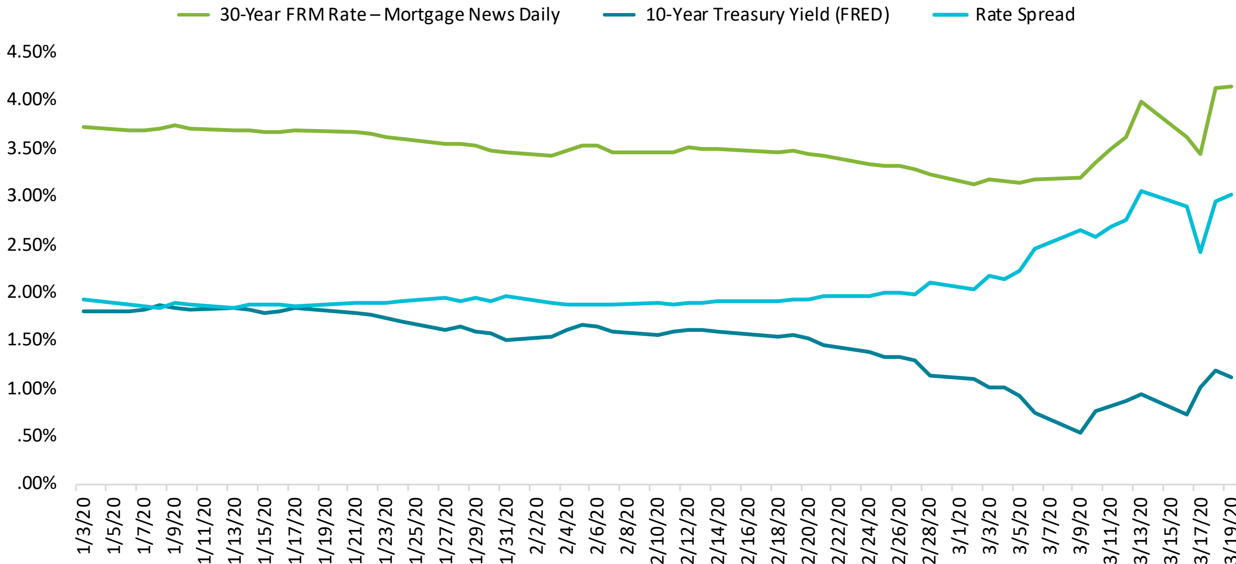
Indeed, March 26 saw a record 3.28 million Americans file for unemployment in a single week, eclipsing the Great Recession peak of 665,000 in March 2009 and the prior record high of 695,000 in October 1982. The following week saw another record-breaking 6.6 million unemployment filings. In total, as of this writing, more than 10 million Americans have now filed for unemployment in the weeks since COVID-19 was labeled a pandemic. The influx of newly unemployed workers swiftly brought the unemployment rate back up to 5.5%, with more expected in the coming weeks. As the self-employed, so-called "gig workers" and others are typically not eligible to apply for unemployment insurance in most states, the true number is likely higher.

Goldman Sachs projects unemployment as high as 15% in Q2 2020.

The potential impacts on the real estate and mortgage ecosystem are significant. General uncertainty in the market and among the public could impact not only the willingness of prospective homebuyers to transact, but also that of lenders to lend and retain business.

Massive unemployment will certainly have an impact on mortgage delinquencies. The recently-passed $2 trillion federal stimulus package could well provide a mitigating effect on delinquencies, via its support of forbearance programs and increased unemployment benefits. However, it may also have unforeseen impacts on servicers' - particularly non-bank servicers - ability to make principal and interest advance payments to investors.

Market volatility has translated to increased interest rate volatility with the spread between the 10-year treasury yields and the 30-year fixed interest mortgage rate jumping from its 6-month average of 1.9% to 3.0% or more by mid-March. Historically, these two move in relative tandem, but surges in refinance application volumes which have overwhelmed originator supply chains, along with uncertainty in the secondary markets, have resulted in 30-year rate increases and widening spreads. That said, with 10-year treasury yields hovering around 0.75% as of March 23, and the Federal Reserve's announcement that it will resume quantitative easing (QE) efforts to reduce friction in secondary markets, the potential for 30-year rate declines and additional surges in refinance applications and servicing portfolio attrition still persist.



The physical effects of social distancing could have an outsized impact on home sales. Curtailment of open houses and showings will likely have an immediate impact. During the SARS outbreak in 2009, Hong Kong real estate transactions declined by 33[1] - 72[2]% and leading indicators such as in-person real estate showings and online real estate searches are suggesting similar declines may be seen in the coming weeks and months.

We could also see disruption to real estate and mortgage-related supply chains. The title, notarization, and appraisal processes, to name but three components of mortgage origination, have all historically required in-person interactions. County recorder office closures could also potentially impact mortgage closing volume. Delays in closings or public record data recordation – which would slow the availability of timely public record data – could also impact industry behavioral and valuation models, real estate indices and other tools.

In the following pages, we will explore these impacts in detail, as well as technologies and other solutions that could have a mitigating effect on a growing set of risks.

[1] Zillow Economic Research (2020),"Hong Kong, SARS, 2003 Aggregated macro data" URL: https://www.zillow.com/research/pandemic-literature-review-26643/

[2] Wong, Grace, 2008. "Has SARS Infected the Property Market? Evidence from Hong Kong." Journal of Urban Economics 63(1), pages 74-05. Retrieved on Feb. 27 2020. URL: https://www.sciencedirect.com/science/article/pii/S0094119007000095

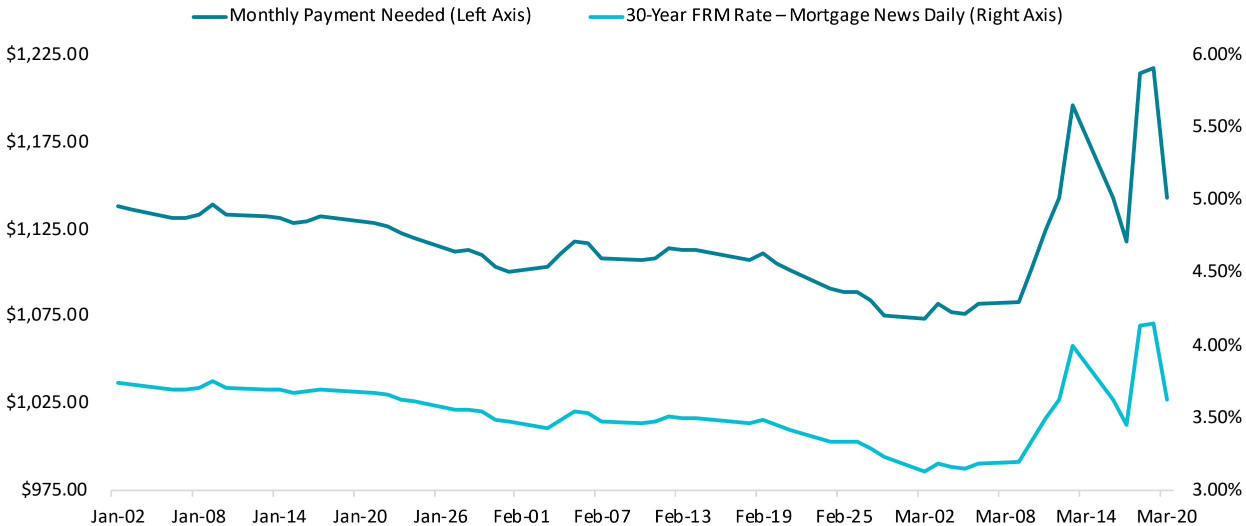
MARKET IMPACT BY SEGMENT

Housing and Real Estate

As of mid-March 2020, low interest rates had pushed home affordability to a three-year high. In turn, this increased buying power had been driving up demand for already limited inventory, resulting in upward pressure on home prices. In short, the housing market was heating up, driven by a low interest rate environment. However, interest rate volatility in recent weeks has had a whipsaw effect on affordability as well as overall purchase demand.

Rate Volatility and Affordability Concerns

Recent jumps in 30-year rates have significantly shifted the affordability landscape, seemingly on a daily basis. The payment required to purchase the average price home fluctuated by more than $138/month (13%) over a two week period, making it difficult for homeowners to gauge how much home they qualify to purchase and creating challenges for those under contract to decide when to lock in their rate.



To look at it another way, a homeowner who qualified for a $1,075/month mortgage payment on March 5 would have been able to purchase the average-priced U.S. home of $313,000 with 20% down. Less than two weeks later on March 19, 30-year rates reached 4.15% according to **Mortgage News Daily**. At that rate, that same homeowner would have only qualified for a $276,800 home purchase – more than a $36,000 reduction in buying power over a two week span.

Rates have since lowered according to Mortgage News Daily (3.44% as of March 23), but the situation remains incredibly volatile. Many potential homebuyers are likely left wondering what their true buying power is on a daily basis, and whether that will have changed by the time an offer is accepted and they're ready to lock in their rate. The Federal Reserve's new wave of quantitative easing (QE) efforts may serve to settle interest rate volatility and restore some of the buying power lost in recent weeks, but with likely unemployment increases on the horizon homebuyer demand is certainly an area of focus for everyone in the real estate and mortgage communities.

Transaction Levels

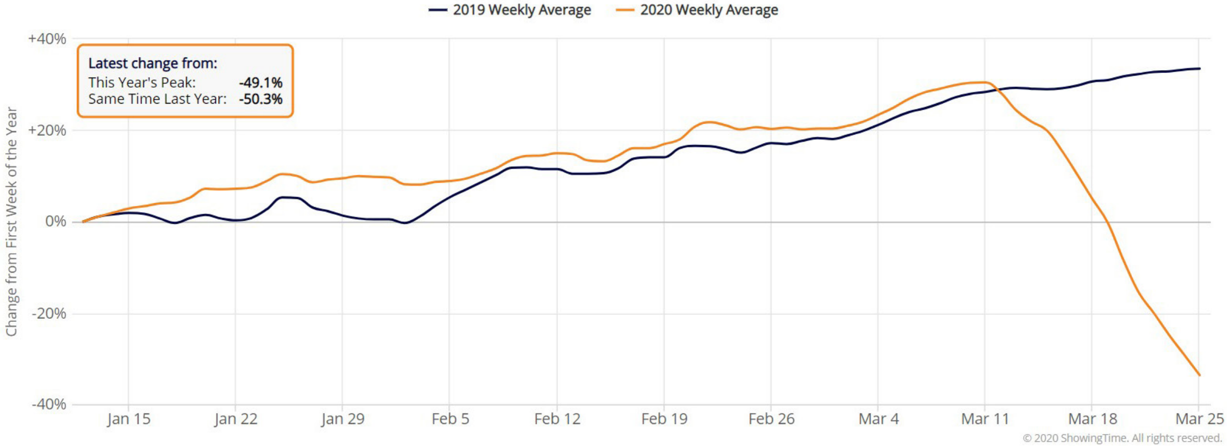
COVID-19, and the social distancing that is being recommended – or mandated – to help slow its spread, could dramatically change this situation even further. While not a direct comparison, as mentioned above, during the SARS epidemic of 2009 the Hong Kong housing market saw incredibly significant declines in residential real estate transactions; however, home prices remained relatively unchanged during this period.[3]

[3] Ibid

Similarly, at this early stage, we are already seeing the initial impact of COVID-19 on the U.S. housing market. According to the online home showing service ShowingTime, the number of in-person real estate showings as of March 25 was **down nearly 50%** from the 2020 peak on March 11. Likewise, aggregate data from **Paragon**, Black Knight's Multiple Listing Service (MLS) platform, shows that as of March 22 online property views by perspective homebuyers were down 24% over the prior 2 weeks.

Impact of COVID-19 to Real Estate Showings in North America

Weekly showings normalized to the first calendar week of January, 7-day moving average. Data through March 25, 2020



Home Prices and Transactions

Home price growth could slow, stall, or even reverse course, depending upon the severity and longevity of the economic downturn. As of this writing, multiple federal and state governmental aid packages have been passed, including a record-breaking $2 trillion stimulus package. The impact of these efforts on the housing market remains to be seen. As mentioned earlier, record-level equity positions in today's market could also aid homeowners in terms of offsetting both default risk and/or short-term income loss by tapping equity to access liquidity.

The COVID-19 pandemic is hitting at a time when real estate transactions are typically ramping up. In an average year, 56% of real estate transactions take place in Q2 and Q3, with June marking the typical seasonal peak.

Using 2019 as a baseline, Black Knight estimates an expected 5.7 million 2020 residential home sales would have totaled over $1.8 trillion in contract volume.

If home sales were to see a 30% decline in Q2 alone it would equate to nearly 500,000 missed real estate transactions, representing over 8% of would-be closings for the year. To put this in dollar terms, that's over $150 billion in real estate closings that would not take place in a single quarter. While this is one possible scenario, both the severity and duration of COVID-19's impact on home sales are still as yet unknown.

Increased buying power from low mortgage interest rates could help to sustain home prices in a temporarily-down economic environment and limit the number of effective losses taken should mortgage defaults rise. However, there could be other impacts as well.

We could see a pullback in the number of homes listed for sale on the MLS, something daily listing volumes are already beginning to suggest is taking place, due to homeowners not wanting foot traffic in their homes. Likewise, social distancing and – in certain states and cities – shelter-in-place orders of indeterminate length will clearly have an impact on in-person

viewing of homes. Technologies such as **Black Knight's Paragon Connect**, which allows for real estate professionals to stay in contact with clients and show homes virtually, could stem this to some extent. However, most prospective buyers will still want to see a home in person prior to making an offer.

Appraisals

To a certain degree, the need for in-person elements of the home purchase process could be ameliorated via technology. Black Knight offers **automated valuation models (AVMs)** that can alleviate the need for a physical appraisal in many cases. Indeed, the limit on home values for properties that do not require a full appraisal but can instead be valued via an AVM was raised from $250,000 to $400,000 in October 2019.

Investments in digital mortgage technology enable much of the real estate/mortgage process to continue online, despite the social distancing impact of COVID-19. However, certain critical aspects of the process – such as onsite property appraisals required by federal regulations – have traditionally demanded in-person interaction. Social distancing and shelter-in-place orders threaten to curtail these crucial pieces of the real estate/mortgage continuum, with potential losses of hundreds of billions of dollars in contract volume.

On March 23, the Federal Housing Finance Agency (FHFA) directed Fannie Mae and Freddie Mac to "provide alternative flexibilities to satisfy appraisal requirements and employment verification requirements through May 17, 2020."

To meet that need, Black Knight has mobile inspection technology that engages the homeowner to provide property photographs and other information to help the appraisal process move forward even in these times of significant economic distress.

Impact to Real Estate Closings

Historically, more than a quarter of all residential real estate transactions have been cash sales, with no mortgage involved. Even for such sales, any delay or disruption to securing title and/or escrow could negatively impact closings, with closing delays or even cancellations being a risk. Business continuity plans (BCPs) at title and escrow offices – in many areas a matter of law – will help to mitigate this issue.

Black Knight's own **TitlePoint** solution uses automation in title searching and order management to enable high-volume title production in a web browser-based application, allowing much of the title process to occur without disruption. Likewise, Black Knight's **Expedite Close** eClosing platform enables – where the law allows – the closing process to occur digitally, without the need for participants to physically be in the same location.

Additionally, anecdotal evidence suggests closing agents have been inventive in adapting to the current reality, holding closings outdoors and increasing mobility.

Mortgage Originations

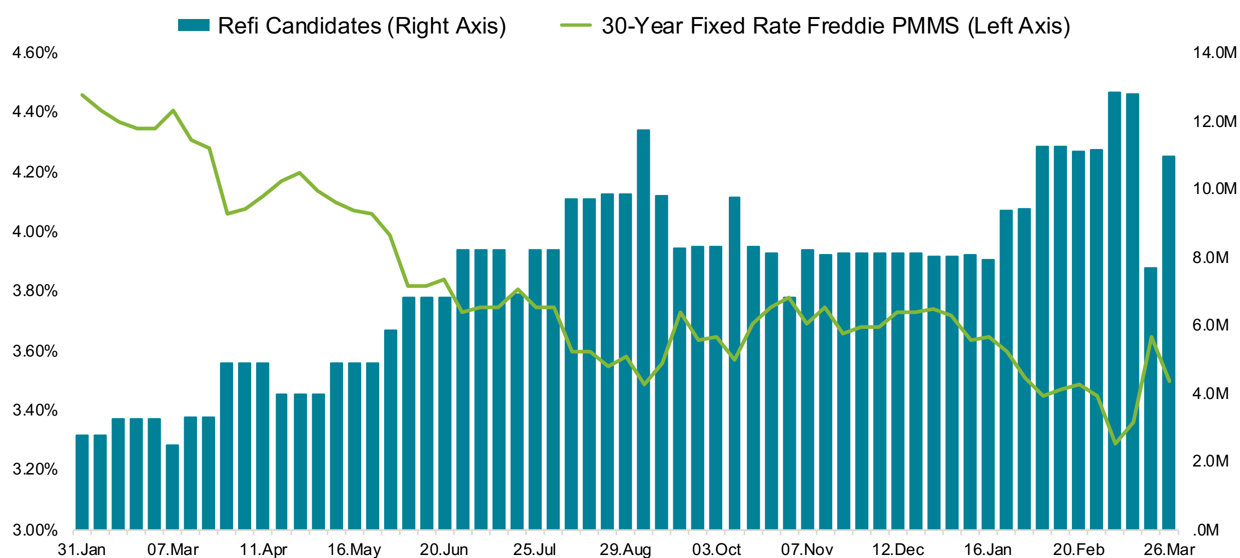
The extent of any negative impact of COVID-19 on overall purchases remains to be seen. This impact will be the result of several factors, including fewer buyers physically out in the market, as well as fears of recession and economic uncertainty among potential buyers. Traditionally, Q2 and Q3 are also the seasonal peaks for purchase lending. Using the same calculation as above for real estate closings, a 30% decline in purchase lending in Q2 2020 would result in a potential $113 billion reduction, representing some 8% of expected volume for the year.

That said, while the interest rate environment remains potentially volatile amid the fears of recession and historically low interest rates, we could still see increased refinance activity, as homeowners try to lock in the lowest rates possible, freeing up monthly cash and providing a liquidity buffer against economic uncertainties.

Refinance Surge

Mortgage originators had already begun shifting to accommodate a refinance-heavy market, and we should expect that trend to continue for the foreseeable future. That said, the refinance landscape is also incredibly volatile. As recently as March 12, based upon analysis of Black Knight's **McDash** loan-level mortgage performance database, there were nearly 13 million high-quality refinance candidates[4] in the market, representing a 60% increase in the refinance incentive since the start of 2020.

However, 30-year rates surged over the following week, due in part to lenders' inability to address refi demand, coupled with volatility in 10-year U.S. Treasury yields. As of March 19, refinance incentive had fallen by 40% from the week prior as 30-year fixed rates jumped by 0.29% in a single week – the largest single-week increase in more than three years. More than five million homeowners lost incentive to refinance their mortgage compared to the week prior. On March 26, 30-year rates fell again, to 3.5%, increasing the population back up to 11 million.



The population remains extremely sensitive to even the slightest rate movements, with a shift of 12.5 basis points (BPS) in either direction adding or subtracting more than a million borrowers from the potential refinance rolls. In recent weeks – due to shortened origination supply (and uncertainty across secondary markets) – the spread between 10-year yields and 30-year rates has been 0.75% or more above the six-month average.

For weeks, lenders had been struggling to deal with a surge in refinance volume, with some even taking to pricing above prevailing rates as a way to stem the tide. This was the case even before lenders were adjusting to a work-from-home stance. If that sort of volume were to return, the struggle would likely be compounded by COVID-19-driven office closures, particularly for lenders who have not embraced mobile technology to allow their loan officers to continue to work from home.

Hedging & Margin Risk

Another challenge facing lenders is margin calls. The surge in volume, led by refinances, requires lenders to hedge their interest rate risk, which they do by forward-selling mortgage-backed securities (MBS). When the market rallies – as it has lately due to the Fed's QE efforts – so quickly and with such magnitude, those hedging trades can quickly become deeply unprofitable. Generally, this is not a problem because the loan on the other side of the trade has become very profitable.

[4] Black Knight defines refinance candidates as 30-year mortgage holders with a maximum 80% loan-to-value (LTV) ratio and credit scores of 720 or higher, who could shave at least 0.75% off their current first mortgage rate by refinancing.

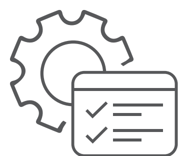
However, the situation around COVID-19 has extended processing times significantly, due to many of the factors covered in this paper. As a result, lenders are not receiving funds from the sale of loans on time, which means they have to pay their hedges before receiving the expected revenue from the loan sale. Further, when the market rallies, the lenders owe margin to the broker/dealers. As the MBS market climbs, lenders need more and more cash reserves to cover these margins, while still waiting for the revenue from loan sales.

As markets have rallied, servicing values are getting materially lower, and the same expansion of the primary-secondary spread that we see at the retail level (i.e., lenders widening their margins) happens at the investor level where lenders are selling loans. Even though lenders are widening their expected profit margin at time of lock, the actual prices they're realizing are much lower than anticipated. This is causing serious strain on lenders, and especially independent mortgage banks. Black Knight's **CompassPoint** solution allows lenders to hedge the servicing values in a pipeline of unclosed interest rate locks. This allows savvy hedgers to actually anticipate the servicing asset's value change and incorporate that into their total hedge.

However, the bigger issue in this case isn't that servicing values declined – that can be modeled using a rate shock; MBS prices rally; servicing prices go down; and vice versa. The issue in this case is that MSR buyers (real estate investment trusts (REITs), in particular) suddenly became capital constrained and stopped purchasing servicing assets. For those retaining servicing, discount rates and delinquencies had to increase because of a disrupted market and expectations of the impact of COVID-19, respectively. Together, these factors deteriorated servicing values far beyond what a rate shock could have predicted, in some cases going all the way to zero.

Technology Differentiates

If 30-year rates are being held artificially high due to lending capacity, it would hold true that lenders that can solve that bottleneck first will have a windfall of opportunity with refinance incentive where it stands today. Those who have automated as much of the origination process as possible have had – and will continue to have – a distinct competitive edge.



Black Knight offers a variety of tools for retention analysis, via both its Rapid Analytics Platform as well as its pipeline-integrated Actionable Intelligence Platform.

The same can be said for those with the proper portfolio and lead monitoring technologies to accurately identify those borrowers who, by virtue of equity position and/or current first mortgage rate, could benefit from a refinance. Black Knight's **CompassCapture** helps lenders identify specific loans within their portfolio or book of leads that could benefit from a refinance based upon equity positions and/or current mortgage rates. Then, using the lender's current pricing – including the most up-to-date market and margin structure – the solution helps deliver multiple personalized pricing scenarios via the **CompassPPE** pricing engine. For lenders whose servicing arms are using Black Knight's consumer-facing **Servicing Digital** solution, these personalized offers can then be delivered directly to the borrower via the app.

There is an increased incentive for both cash-out refinance and home equity line of credit (HELOC) lending. In addition to generally historically low mortgage interest rates, the Federal Reserve reduced its target rate to essentially zero in an attempt to shore up the markets and limit the economic fallout of COVID-19. This, in turn, has recently made HELOCs more affordable – and therefore attractive – to borrowers, as the spread between 30-year cash-out rates and HELOC rate offerings had been widening over the past few years.

Both HELOCs and cash-out refinances – which hit a 10-year high in Q4 2019 – could represent a source of low-interest cash for homeowners to help offset any short-term loss in income associated with the pandemic. Of course, as unemployment numbers, and potentially mortgage delinquencies, rise, underwriting criteria could be tightened further, restricting access to equity for some homeowners.

Digital Mortgages

The potential for delayed or cancelled closings persists, and is as great of a concern for purchase lending as it is for cash sales. Many county recorders have yet to fully digitize operations, and as such depend upon high-touch, manual processes for both input and production of property records. Shelter-in-place orders or even widespread social distancing efforts could hamper their ability to fulfill their part of the process, which could reduce the volume of both purchase and refinance lending along with overall real estate transactions.

As a result of years of investment and innovation in digital mortgage technology, Black Knight has enabled much, if not all, of the mortgage application and closing process to happen online and remotely. This means that lending, particularly refinance lending, can continue unabated, and help to move the market forward for some time, even in the midst of this global health crisis.

Multiple Black Knight origination technologies facilitate a "contact-less" mortgage origination process.

These solutions run the gamut from our **Digital Point of Sale** which allows prospective borrowers to initiate the mortgage application process remotely; to **AIVA**, our artificial intelligence solution which assists in ensuring that all necessary documentation is gathered via online channels.

Through automated and "lights out" processing, a multitude of origination and underwriting tasks can occur without human intervention in our **Empower** loan origination system, while the **Loan Officer Digital** solution allows for the remote, online completion of tasks by loan officers themselves. Likewise, Black Knight's online **Exchange** solution allows for the ordering and fulfillment of multiple origination-related services.

Finally, our **Expedite Close** eClosing solution supports all forms of real estate closings, including – where permitted by law – completely digital mortgage closings, supported by remote online notarization. This enables loans to close with the utmost social distancing – allowing the buyer to remain in their home, while the closing agent is at a different location.

In mid-march, Senators Mark Warner (D-Va.) and Kevin Cramer (R-N.D.) introduced S. 3533, the "Securing and Enabling Commerce Using Remote and Electronic (SECURE) Notarization Act of 2020."

This bipartisan legislation would permit immediate nationwide use of Remote Online Notarizations. Passing the legislation would be an essential step in removing one of the primary roadblocks facing a fully digital real estate transaction, which is critical in these times.

Mortgage Servicing

With 10-year yields falling to record lows in March and 30-year rates following suit, the surge in refinance applications caused run-off risk in servicers' portfolios to skyrocket and, correspondingly, mortgage servicing rights (MSR) valuations to plummet. While this tidal wave may have subsided temporarily due to padded 30-year rate offerings curtailing refinance demand in the near term, current 10-year treasury rates (hovering around 0.75% as of March 23) suggest that if rate spreads normalize in coming weeks as the Federal Reserve enacts broad-based QE efforts, refinance applications could surge again.

Retention Risk

During the week of March 19, more than 5 million homeowners lost the incentive to refinance. But if 30-year rates fall back to 3.25% or below, refinance incentive could jump by nearly 90% overnight, causing significant runoff risk and MSR devaluation. Servicers would do well to proactively prepare retention strategies during what could be a temporary rise in 30-year rate offerings so as to be ready to mitigate a wave of refinance-driven payoffs.

Retention modifications have become increasingly popular as servicers look to stem the runoff in their books with limited origination resources. Black Knight has an extensive ability to break down retention risk and capture opportunity via a variety of data and analytics solutions that can help servicers to stay on top of retention efforts. In the event of widespread economic distress, these could serve as both a tool for retention and loss mitigation.

Portfolios are experiencing competing risk – prepayment due to factors outlined here as well as the prospect of increased defaults, which are discussed below. This combination has significant implications on overall portfolio health. It remains to be seen if non-bank lenders will have sufficient capital reserves to successfully "pick off" loans from bank portfolios.

Portfolio retention efforts begin at the loan level. Black Knight's consumer-facing **Servicing Digital** solution helps mortgage servicers build rich and deep relationships with their customers, increasing the chances to retain their business. A mobile solution that gives customers fast, around-the-clock access to home and loan information that is relevant and easy to understand, **Servicing Digital** provides servicers with a platform for continual engagement with their customers.

Black Knight's consumer-facing Servicing Digital solution helps mortgage servicers build rich and deep relationships with their customers, increasing the chances to retain their business.

Default Mortgage Servicing / Loss Mitigation

While the record low levels of mortgage delinquencies seen in recent months are no doubt a positive for the mortgage market and the economy as a whole, they also reflect the fact that the number of servicing staff on hand to manage default operations has likely been reduced in recent years. This creates challenges for servicers as they ramp up staffing to deal with the likely influx of homeowners struggling to make mortgage payments in the wake of the COVID-19 outbreak, while also implementing the myriad of government and private sector programs and policies being put in place.

Forbearance and Moratoriums

New York was one of the first states to react, enacting a 90-day mortgage relief period for the state's homeowners. Other states and localities are following suit. While the logistics and legality of these enactments are still unclear, others in the private sector are also beginning to act. Bank of America has also announced that it will allow borrowers to pause mortgage payments on its portfolio-held loans and similar announcements from other servicers are likely on the way.

Both the Department of Housing and Urban Development (HUD) and the FHFA have already announced temporary moratoria on foreclosures and evictions during the pandemic. Likewise, the FHFA had announced forbearance programs for impacted borrowers, allowing mortgage payments to be suspended for up to 12 months. The $2 trillion dollar stimulus package codifies these terms across the board.

While many are scrambling to put programs in place to assist impacted borrowers, gauging the number of homeowners who will need of such assistance is a daunting task. Even early reports on such affected homeowners may be months away – given that most business shutdowns in the U.S. didn't take place until after the vast majority of homeowners had already made their March mortgage payments.

Finding Comparisons

Using historically-based models to predict the fallout from the COVID-19 crisis can be as much an art as a science, as there have been no true corollaries in recent history. We could turn to the Great Recession of 2008, which saw unemployment spike to 10%, mortgage delinquencies hit 10.6% and more than 4% of all mortgages fall into foreclosure. When all was said and done, some 7 million homes were lost to foreclosure, and only after a years-long recovery did home prices and mortgage performance begin to rebound.

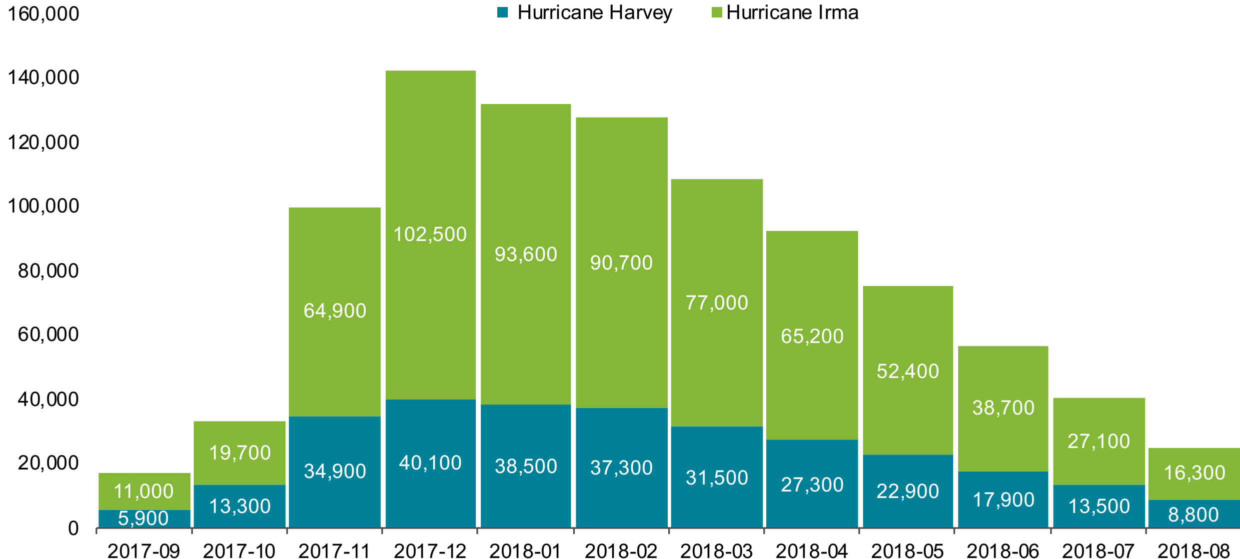
Again, it's not a perfect comparison, as the instigating factors of the Great Recession were far different, as was the make-up of the housing and mortgage markets. The credit quality of today's mortgage borrower is significantly higher today than during that period, and the loan product mix is different as well. There are, for example, far fewer adjustable rate mortgages (ARMs), and today new originations within the subprime segment are basically non-existent. Any ARM reset risk today is further mitigated by the Federal Reserve's recent interest rate reduction which could result in home owners with seasoned ARMs seeing their rates decline rather than the payment shocks which acted as a catalyst for ARM loan defaults during the Great Recession.

Metric	Entering 2007	Today (February 2020)
Number of Active Mortgages	53.7M	52.9M
Share of Homeowners With Less Than 10% Equity	14.50%	6.60%
Total Market CLTV	57.40%	52.30%
Average Current CLTV	61.83%	53.31%
Average DTI at Origination	34.5	33.5
Average Original Credit Score	708	736
Average Current Credit Score	713	747
Mortgage Delinquency Rate	4.92%	3.28%
Payment-to-Income Ratio*	31.80%	20.90%
Number of Active Subprime Loans	5,100,000	1,980,000
Number of Active ARM Mortgages	12,890,000	3,200,000
ARM Mortgages Schedule to Reset Within 3 Years	4,950,000	320,000
Number of Active Option ARM Loans	2,230,000	384,000
GNMA/GSE Share	**63%**	**75%**

*Share of median income needed to purchase average price home with 20% down payment

Likewise, strategic defaults – which were so prevalent during the Great Recession – are likely to be less of an issue as we deal with fallout of COVID-19. The record levels of equity held by today's mortgage holders, as well as improved forbearance and modification options, will likely offset any significant move toward strategic defaults.

We could also look to how mortgage performance has been impacted in times of natural disaster. Based upon an analysis of Black Knight's **McDash** loan-level mortgage performance data, the 2017 hurricane season, for example, resulted in historically large spikes in serious delinquencies. These were mitigated by an aggressive effort to assist borrowers through various forbearance programs, which – to a very large degree – were successful in preventing a short-term crisis from becoming a long-term problem.



In the case of Hurricanes Harvey and Irma, some 142,000 borrowers became seriously delinquent in the wake of the storms, representing over 3% of mortgaged properties in affected areas. While the recovery period was extensive – well over a year – as of February 2020, just 1% of those that became seriously delinquent following the storm had lost their home to foreclosure or short sale. When compared with 15% of new serious delinquent borrowers outside of the hurricane zones over the same period of time, we can see that such forbearance programs worked well for the overwhelming number of impacted homeowners.

McDash Custom Data Analysis
Current Status of Borrowers that became SDQ following 2017 Hurricane Events

Current Status (As of Dec 2019)	Hurricane Irma (FEMA Declared Counties)	Hurricane Irma (FEMA Declared Counties)	Non-Hurricane Affected Areas
Current on Mortgage Payments	63%	63%	30%
Refinanced/Sold Home	22%	22%	22%
30-60 Days DQ	8%	8%	11%
90+ Days DQ	3%	3%	10%
Active Foreclosure	3%	3%	12%
FC Sale / Short Sale	1%	1%	15%
Overall	**100%**	**100%**	**100%**

The analysis above details the current (or final) status of borrowers that were current on their mortgage prior to hurricanes Harvey and Irma and became 90 or more days delinquent in the 4 months following the storm. The "Non-Hurricane Affected Areas" provides a benchmark for borrowers outside of hurricane affected areas that became seriously delinquent at the same time.

If we were to apply that same 3.2% default rate seen in hurricane-affected areas following 2017's natural disasters to the full U.S. mortgage market, it would result in more than 1.7 million homeowners becoming 90 or more days past due on their mortgage in coming months.

The Scope of the Risk

Still, these numbers are not an "apples for apples" comparison, since the hurricanes – as terribly destructive as they were – were isolated moments in time, with little long-term fallout. What the mortgage industry – indeed the nation and the world – face with regard to COVID-19 is something much larger, broader, and more uncertain in nature. Something with the potential scope of the 2008 crisis, but with the abrupt nature of a natural disaster-related event.

In attempt to quantify the default risk, Black Knight's **AFT** modeling team looked at multiple scenarios based upon various publicly projected unemployment rates. Using the Goldman Sachs projection of 15% unemployment by Q2 2020, we could see an additional 6.6% of homeowners becoming past due on their mortgage. This increase of 3.5 million delinquent borrowers would push the total non-current rate (everything 30 or more days past due or in active foreclosure) to 10.3%.

Black Knight's AFT modeling team looked at various scenarios, and an unemployment rate of 15% could see an additional 6.6% of homeowners becoming past due on their mortgage, increasing the total non-current rate to 10.3%.

The 20% unemployment rate postulated by Secretary Mnuchin would likewise push the non-current rate to 13.1%, with roughly 5 million homeowners becoming past due. The outside number of 30% unemployment as suggested by President Bullard of the Federal Reserve Bank of St. Louis would, if sustained, result in a nearly unthinkable non-current rate of 18.8%, a 15% increase from the end of February. Some 8 million mortgage-holders would become past due in this unlikely situation, pushing the non-current rate above even its great recession peak.

It should be noted that the models used for this analysis are based on past performance and, as such, do not exactly reflect the substantially better credit quality of today's mortgage market as compared to periods with high unemployment in the recent past. In addition, today's economic environment might not be as severe as the recent past, considering historically low interest rates and the fact that any immediate shock to house prices has yet to be observed.

Loss Mitigation

Black Knight's **Loss Mitigation** module, which is seamlessly integrated with its **MSP** servicing system, helps servicers to systematically identify borrowers who are eligible for forbearance programs as well as a wide variety of loan modification options. Together with **MSP**, **Loss Mitigation** allows servicers to more easily manage – and automate the management of – forbearance and modification programs, with full documentation for regulatory compliance as well. Additionally, these offers can be provided directly to impacted borrowers via Black Knight's **Servicing Digital** app.

Loss Mitigation allows servicers who use the **MSP** system to easily automate the cessation of charging delinquent borrowers late fees, suspend foreclosure actions on eligible borrowers and ensure that borrowers who are in forbearance programs are not reported as delinquent to the credit bureaus. Additionally it streamlines post-forbearance workout options depending upon specific investor or insurer requirements.

Based on data from Black Knight's **McDash** loan-level mortgage performance database, the average P&I payment is currently $1,216 per month, totaling $65 billion per month in aggregate for the 52.9 million outstanding U.S. mortgages. Fannie Mae-, Freddie Mac- and Ginnie Mae-securitized loans make up roughly three quarters of these, with aggregate P&I payments totaling $42 billion per month. Should 5% of homeowners need payment deferrals via forbearance plans, servicers would need to pay securities holders more than $2.1 billion per month in P&I advances. At 10%, the monthly cost would jump to $4.2 billion and to $8.48 billion per month should the share of borrowers in forbearance reach 20%.

	FNMA / FHLMC	FHA/VA	Portfolio/Other	Private Security	Total Market
Active Loan Count	27.9M	12.1M	10.4M	2.5M	52.9M
Average Monthly P&I Payment*	$1,115	$903	$1,816	$1,349	$1,216
Aggregate Monthly P&I Payment*	$31.1B	$10.9B	$18.9B	$3.4B	$64.9B
Estimated monthly P&I advances: If 5% of borrowers require payment deferral or forbearance assistance	***$1.6B***	***$.5B***	$.9B	$.2B	$3.2B
Estimated monthly P&I advances: If 10% of borrowers require payment deferral or forbearance assistance	***$3.1B***	***$1.1B***	$1.9B	$.3B	$6.5B
Estimated monthly P&I advances: If 20% of borrowers require payment deferral or forbearance assistance	***$6.2B***	***$2.2B***	$3.8B	$.7B	$13.0B

*Based on data observations from Black Knight's McDash data set and extrapolated to estimate the full mortgage market

With the number of delinquent borrowers expected to significantly increase in coming months, servicers' capital reserves will be tested. While capital ratios have been mandated since the 2008 financial crisis, and capital reserves are stronger than they were during the previous recession, this will be the first significant test since they were mandated. It remains to be seen whether servicers, particularly non-bank lenders, have sufficient capital to make P&I advances to bond-holders on a large number of forbearances.

Government and Capital Markets

The mortgage capital markets, both primary and secondary, play a critical role as providers of funding and liquidity to enable lenders to make home loans to borrowers. Mortgages are made possible in large part by market participants buying, selling or holding mortgage-backed securities (MBS) and loan portfolios. Preeminent among these are the Government-sponsored Enterprises (GSEs), Fannie Mae and Freddie Mac, who, along with Ginnie Mae and the FHA (under the auspices of the Department of Housing and Urban Development (HUD)) and Veterans Administration (VA), provide back-stop guarantees which are fundamental for market stability and to minimize systemic risk.

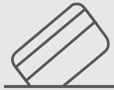
Market oversight is performed by federal and state regulators with the Federal Reserve, Securities and Exchange Commission (SEC), the Federal Finance Housing Agency (FHFA), Office of the Comptroller of the Currency (OCC) and the Consumer Financial Protection Board (CFPB) all playing major roles in ensuring market transparency, financial institution safety and soundness and consumer protection.

The 2008 credit crisis had its origins in the subprime mortgage market and complex financial instruments based on these mortgages. In the period that followed, regulators and market participants, such as investment banks and ratings agencies, initiated major changes to increase transparency, improve liquidity, and enhance underwriting standards. These changes – along with a benign inflation and interest rate environment – have made the capital markets more robust. Credit quality – as measured by origination credit scores and actual loan performance – was at an all-time high as we entered 2020.

Capital Markets Impact

COVID-19 has impacted the mortgage capital markets in a number of distinct ways:

Production: Primary and secondary markets need loans to aggregate, package and securitize, so any diminution in origination flow (caused by falling levels of home purchases and refinance volumes) will negatively impact trading.



Credit: The background of pristine loan performance and solid home equity will sooth market trepidation, but the sheer uniqueness of the current crisis makes internal stress testing for extreme economic scenarios a major challenge for risk and pricing models – which drive securities valuation and hence balance sheet robustness.

Segment-specific: A number of financial supports are currently being put in place specifically for mortgage borrowers, but there has not, as of the date of writing, been a U.S.-wide set of financial supports for renters. This particularly affects the Single-Family Rental (SFR) and Multi-Family (MF) securities markets.

In response, the federal government has introduced a variety of measures to ensure that the mortgage and real estate markets will continue to function and be stable. These include the Federal Reserve's commitment to re-igniting QE efforts to include the purchase of MBS; the implementation of foreclosure and eviction moratoriums by HUD and FHFA; and increased flexibility by FHFA for appraisals and borrower income verification for GSE loans.

Compelled by the government, and demanded by borrowers, market participants will be challenged to implement these – and likely other potential policy changes – as rapidly as possible. Black Knight is well-positioned to assist traders, asset and risk managers, ratings agencies, due diligence firms and regulators in this evolving new paradigm. For example, our homeowner-assisted appraisal technologies and AVMs provide automated, social distancing-compliant, solutions to value a property, validate that value and forecast that value using our vast databases of home prices and highly-granular models.

Governmental Needs

Government entities themselves will be in need of modeling assistance and program implementation, as they have a need to understand and quantify the potential volumes associated with these forbearance programs. Currently, there are challenges with addressing not only federally-mandated relief programs, but also the array of ordinances being put into place by state and local governments.

Black Knight is able to support our government clients in this respect, and can provide near-real-time feedback on forbearance volumes, as well as leading indicators for financial stress and default risk among homeowners. In addition, we are uniquely situated, by virtue of MSP's market share in the mortgage servicing industry, to be of assistance in both informing servicers of and helping to implement these programs at scale in real time.

These new federal measures – along with new economic stabilization and stimulus policies – will all require oversight as to their effectiveness. Ultimately, that effectiveness will be assessed on home sales and lending volumes and the performance of RMBS' and their underlying loans. Black Knight tracks all of these at the individual loan and property levels. We can run **AVMs** on nearly 120 million residential properties, while our **McDash** loan-level performance database includes data on 31.5 million active residential mortgages and more than 185 million historical records.

Prepay speeds will show significant heterogeneity across collateral classes (e.g., Credit Risk Transfer RMBS will differ from Non-QM), while self-employed borrowers may require additional risk assessment if they exhibit liquidity constraints at the behavioral level. Loan-level performance models forecasting delinquency, default and prepayment are more essential than ever in understanding individual borrower behavior. Black Knight's **AFT** suite of agency and non-agency models offer market and customizable tools for measuring these competing risks.

Overall, the markets are reassured by strong levels of loan performance and home equity going into this crisis, and the clear commitment of the Federal Reserve to "do what it takes" to provide liquidity and stability. The greatest unknown is consumer behavior in this unprecedented environment.

RECOMMENDATIONS

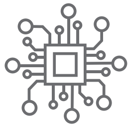
These are unprecedented times, for the world as a whole and for the real estate and mortgage industries specifically. In response, at this time Black Knight recommends the following:

Real Estate
Real estate professionals – from MLS organizations down to individual brokers and agents – need to leverage technology that will allow both the listing and showing of properties for sale to continue unabated. Virtual showings, interactive communication with clients and seamless, online integration with other partners in the real estate transaction are critical in this environment.

Automated Technology
Parties across the real estate and mortgage continuum should be actively seeking automated technology solutions that can help as the industry shifts to accommodate today's reality. From mobile inspection technology that engages the homeowner to provide property photographs and other information to help the appraisal process, to eSignature and remote online notarization capabilities, solutions exist today that can help.

Title and Closing
Title and closing offices are the linchpins of both lending and real estate transactions and keeping those operations flowing may be the key to limiting revenue losses during this time. Title providers – and the real estate and mortgage professionals with whom they do business – would do well to seek out the most digitally-capable options for title, escrow and closing.

Online Notarization
Currently, 23 states allow the use of two way audio-visual communication and/or remote online notarization to securely execute documents. Further expansion could help to secure the supply chain in other states. The recently introduced SECURE Act would go a long way toward enabling this functionality nationwide. This is no longer simply a "nice to have" functionality, or something that can be put off for future implementation – the technology is key to helping the real estate and mortgage sectors continue to operate in the COVID-19 era.



Digital Mortgage Technology

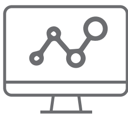
Lenders who have made investments in digital mortgage technology – both consumer-facing as well as streamlined, automated execution of the origination and underwriting processes – stand the best chance of weathering the impact to originations. Technologies lenders must implement, and consumers have come to expect, include digital points of sale, interactive loan officer technology and – critically – robust eClose functionality. Those lenders that have not implemented such digital technologies should do so as soon as possible to not just remain competitive, but to remain in business.

Default Servicing

Mortgage servicers should be ramping-up capacity for incoming defaults now, both by way of increasing staffing and implementing technology to help with the projected increase. While the true volumes of defaults we will see remain unclear at this juncture, what is clear is that additional resources will be needed to implement the myriad of programs being enacted to assist financially-affected borrowers. Servicers are urged to ramp up both staffing and technology resources to help absorb the expected spike in delinquent borrowers.

Retention Risk

Likewise, we recommend servicers proactively prepare for increased attrition risk due to falling 30-year interest rates. Recent rate increases have provided servicers with a needed delay in run-off but this may be but a temporary respite; with 10-year treasury yields remaining low, the potential for pull-back in 30-year rates remains. To that end, servicers should enact data-driven strategies to proactively identify attrition risk and make efforts to retain those loans to stabilize, and even build, servicing portfolios.



Portfolio Performance Modeling

Portfolio performance modeling should leverage historical recession data – as opposed to recent vintages – in order to capture appropriate both short- and long-term default risk rates. Likewise, portfolio performance modeling needs to be given prominent attention and resources. There are two sides of the performance coin, prepayment and default. Today's environment increases both risks. Understanding competing risk in this environment will be critical, as lenders will seek to retain lower risk product, even more so than they do in periods of "normal" market dynamics.

Future-Forward

It is also important to remember that – while we still do not know the true scope, length or cost of this pandemic – this may ultimately prove to be a temporary situation. When the smoke clears and the economy regains its footing, there is likely to be massive pent up demand for housing. Moves the industry makes today to meet the specific challenges of the day could also help pave the way for a more seamless real estate transaction in the future.

HOW BLACK KNIGHT CAN HELP

Black Knight's solution set is uniquely suited to meeting the real estate and mortgage industry's most challenging needs in the face of the COVID-19 pandemic and the nation's response to the same.

Collaborative Real Estate Tools

Paragon, Black Knight's MLS platform, and its **Paragon Connect** functionality can be used by real estate professionals to continue to list and virtually show properties for sale, stay in contact with and collaborate with their clients and industry partners, and maintain business in a time of uncertainty.

Remote Appraisal and Automated Valuation

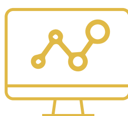
Black Knight applauds the FHFA's decision to allow flexibility in the appraisal process, as multiple technology solutions exist that will enable appraisers to continue to provide their professional expertise, even in the face of shelter-in-place orders. Our **homeowner-assisted remote appraisal** product allows for just such regulatory-compliant appraisals to be completed by a professional appraiser without needing to physically enter a home. Likewise, Black Knight has the ability – integrated into multiple product offerings – to run accurate **AVMs** on nearly 120 million residential properties for those transactions that do not require a full appraisal.

End-to-End Digital Mortgage

Further, Black Knight's years of investment and innovation in digital mortgage technology allow a majority of the mortgage application, underwriting and closing process to happen online and remotely.Our consumer-facing **Digital Point of Sale** is thoroughly integrated with both the company's **Empower LOS** and our **Loan Officer Digital** solution. **AIVA**, our artificial intelligence virtual assistant, not only helps streamline the borrower's online application process, but also employs vast machine learning-trained tools to improve and speed the document collection and underwriting processes.

eClosing and Title

Likewise, our **Expedite Close** eClosing platform can allow mortgage closings to occur anytime, anywhere, without the need for physical proximity of buyers, sellers or closing officers. Digitized title plants accessed via Black Knight's **TitlePoint** solution are also critical components to keeping the process moving forward, despite the crisis. Together, these powerful, integrated and innovative solutions give lenders the tools they need to continue the mortgage process even under the restrictions resulting from COVID-19.



Smart Servicing Technology

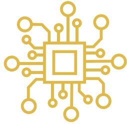
Black Knight's **Actionable Intelligence platform**, with its forward-looking delinquency indicators can be of great assistance in both ongoing, proactive portfolio monitoring as well as helping servicers quantify potential forbearance need among their customers. Likewise, technology solutions like Black Knight's **Loss Mitigation** module of its **MSP** servicing system will be essential in systematically identifying and engaging borrowers who are eligible for forbearance programs as well as a variety of loan modification options.

Loss Mitigation and Customer Engagement

Together with **MSP**, **Loss Mitigation** allows servicers to more easily manage – and automate the management – of forbearance, modification and workout programs, with full documentation for regulatory compliance. Black Knight's consumer-facing **Servicing Digital** app can serve not only as a direct line of communication with troubled borrowers around forbearance and workout programs, but also as a way to strengthen relationships with performing customers whose business the lender seeks to retain.

Portfolio Analytics

Black Knight also has an extensive set of capabilities that break down retention risk and capture opportunity via a variety of data and analytics solutions that can help servicers to stay on top of retention efforts. Black Knight's robust property and **McDash** loan-level mortgage data, together with our industry-leading **AFT** prepayment and default models, are more essential than ever in such an environment. Additionally, our **Rapid Analytics Platform**, with its easy access to Growth and Retention and Recession and Recovery notebooks and other advanced analytics, can provide much needed clarity and insight at a time of such great uncertainty.

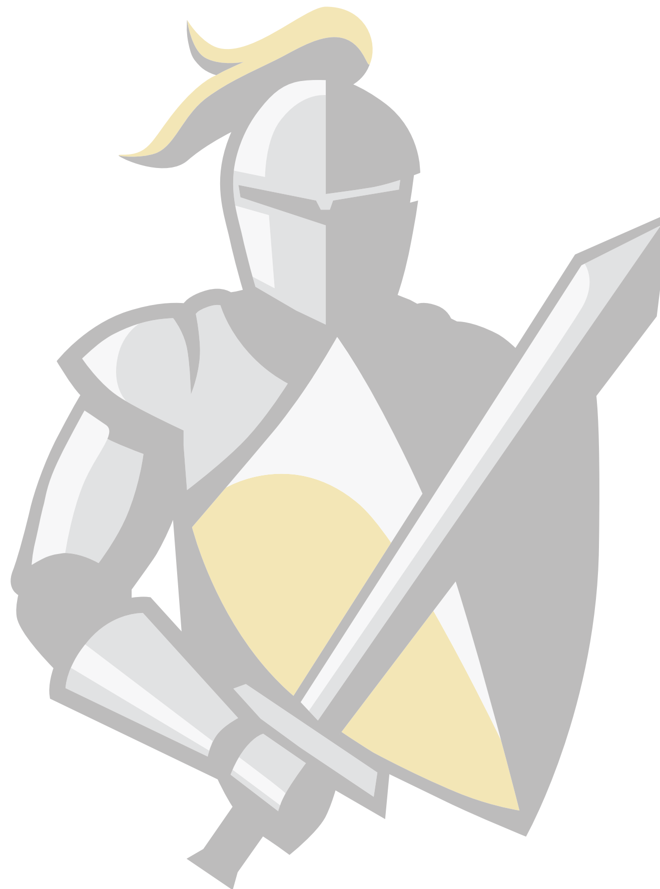


The Right Technology at the Right Time

It is critical for real estate and mortgage industry participants to have **the right technology partners** in days such as this. A partner that has a truly holistic view of the mortgage and housing lifecycle is essential, as is one who can **provide near real time data and actionable intelligence**. Black Knight remains committed to being just that partner for all of our clients, across the entirety of the real estate-mortgage spectrum.

These qualities are more important now than ever, given that in today's uncertain environment, it is days, not months, that are separating the prepared from those who are not.

As this remains a very fluid situation, with changes occurring on a daily basis, we will continue to monitor the industry impact and implications and provide supplemental updates via **Vision, the Black Knight blog**. We encourage you to visit for more information in the coming days and weeks. If you have any questions about any of the solutions referenced above or the impact of COVID-19, please contact Black Knight via **BlackKnight@bkfs.com**.



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