**Analytics Insight**
Sustainable Investment | Methodology

# ESG taxonomy for securitized products

A quantitative approach to detecting responsible lending and servicing behaviors in RMBS markets

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## Executive summary

Investors are increasingly recognizing the value of incorporating sustainable investment principles in financial analysis, but integration of these within fixed income has typically lagged behind equity due to complexity and data reliability. Within this, the world of securitized instruments has had even lower focus. Early adopters have the advantage through deeper understanding of the risks and opportunities, but there are nuanced complexities unique to the securitized asset class that must be handled.

In this paper we present Yield Book's ESG Taxonomy suite for securitized assets, focusing on our methodologies behind the construction of quantitative metrics and scores for our first phase—the measurement of responsible lending and responsible servicing in Agency and non-Agency RMBS markets.

In the construction of these metrics, we utilize Yield Book's dataset with a history of over 20 years, best-in-class expertise within the securitized asset class and advanced statistical methods. The application of this ESG Taxonomy equips clients with a deeper and quantitative understanding of risks and opportunities within this complex asset class. The metrics can also be used for benchmarking purposes and the basis for engagement with lenders and servicers.

The methodologies presented in this paper aim to facilitate the industry, as a whole, to begin meaningful discussion and incorporation of these concepts through a bottom-up approach, addressing the need for a quantitative methodology using a golden source of data.

# Table of contents

# Abbreviations

| | |
|---|---|
| **ABS** | Asset Backed Security |
| **ARM** | Adjustable Rate Mortgage |
| **ASIF** | Australian Sustainable Investment Forum |
| **CMBS** | Commercial Mortgage Backed Securities |
| **CRT** | Credit Risk Transfer instrument |
| **ESG** | Environmental, Social and Governance |
| **FSB** | Financial Stability Board |
| **MBS** | Mortgage Backed Securities |
| **RMBS** | Residential Mortgage Backed Securities |
| **SDG** | Sustainable Development Goals |
| **SI** | Sustainable Investment |
| **SRI** | Sustainable and Responsible Investment |
| **TCFD** | Taskforce for Climate-related Financial Disclosures |
| **UN PRI** | United Nations Principles for Responsible Investment |

# Rise of sustainable investment in financial markets

## Introduction

**Sustainable investment** (SI) encompasses a wide range of approaches to investing, incorporating issues not typically included in traditional financial analysis. Methods include the incorporation of environmental, social, and governance (ESG) considerations in the process of financial investment, as well as "green" or climate-focussed investing, negative or positive screening and exclusions, and impact or "thematic" investment.

There has been widespread uptake of the approaches within investment processes over the last 10 years as decision-makers have started to understand the unique risks and opportunities around the application of SI. By the beginning of 2018, assets invested incorporating meaningful sustainability principles had reached $31 trillion, with an outlook of 17% annual growth to 2025 implying a current market size of $42 trillion and potentially topping $53 trillion in 2021. Nearly half is currently managed in Europe; Japan led growth with a four-fold increase over two years, but there was strong annual growth of 16% across all regions.

**Figure 1. Growth in sustainably invested assets regionally**
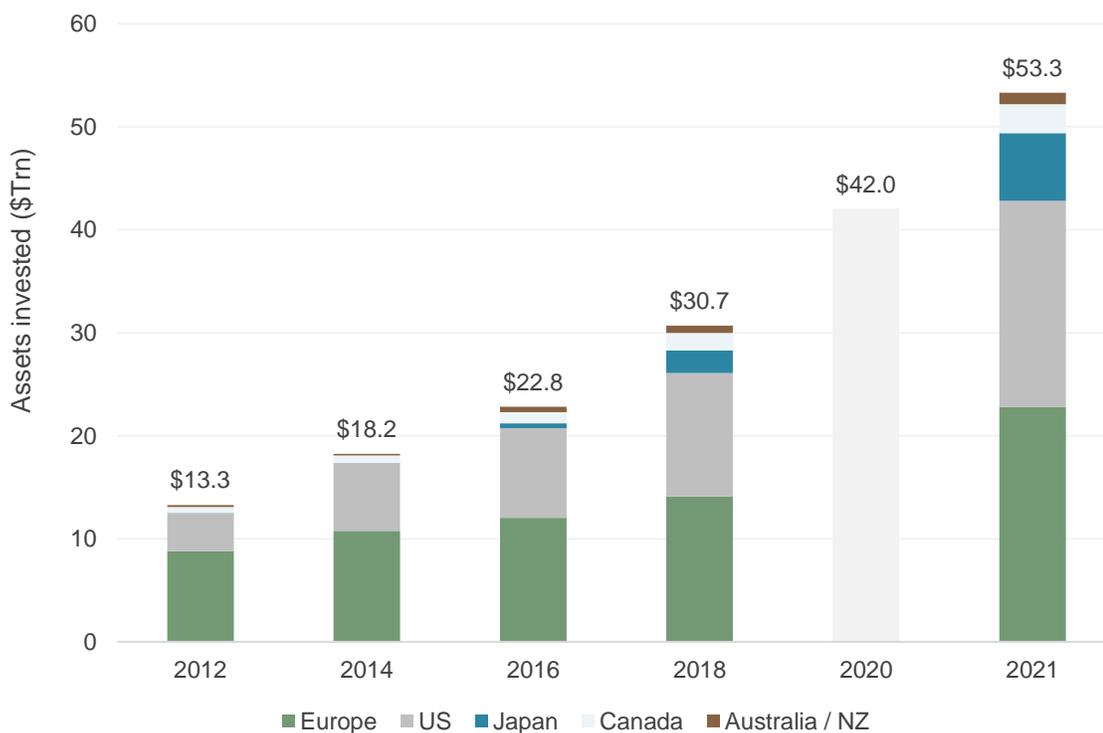


Source: Global Sustainable Investment Alliance, Global Sustainable Investment Review 2014, 2016, 2018; Deloitte, Advancing environmental, social, and governance investing, 2020 (regional split unavailable); Celent ESG in Portfolio Management, 2021 estimate

However, implementation of SI principles remains a challenge for investors. There are diverse views about the definition of ESG itself, especially with regard to the social component, against a backdrop of data inconsistencies and gaps. A large and growing number of data vendors conduct research, but methodologies are inconsistently applied and often subjective, and data itself often lags several years or has significant gaps.

# Double-digit growth in SI is driven from multiple angles

The aggressively growing appetite for consideration of sustainability and ESG issues within financial markets is driven by three key factors, despite the challenges to investment faced by investors:

- **Credit risk and performance expectations**

  Increasing independent research shows ESG as material factors in credit risk[1]; integrating ESG factors into the actual investment process might lead to the exclusion of certain segments of assets, producing a seemingly suboptimal portfolio. However, including ESG aspects can not only increase understanding of risk, but also be beneficial to performance— there is empirical evidence that the governance component of ESG can lead to superior return expectations. A positive correlation between environmental performance and subsequent stock performance has been presented in several studies[2], and on the governance side, the reputation and employee satisfaction gains stemming from good social behavior, as mandated by ESG, can also improve performance[3]. This improvement can be derived from increased productivity, less staff turnover, or even fewer incidents of fraud. Moreover, many studies indicate that funds employing a sustainable investment approach do not observe significantly different returns from those of conventional funds[4]. In the fixed income scenario, there is solid evidence of lower spreads and better credit ratings for corporate bonds, and of better performance and lower credit risk for sovereigns[5].

- **Asset owner demand**

  The majority of asset owners actively integrate ESG factors into their investment process and consider sustainable investing a core risk mitigation strategy, with nearly six in 10 envisioning their future allocation solely to investment managers who formally consider ESG in their processes[6]. This bottom-up push to uptake from both a risk and issue consciousness perspective is difficult for managers to action without consistent and data-driven approach to integration, and providers are pivoting their strategies in order to offer layers of ESG on top of existing models.

- **Global government policy**

  Top-down policy is driving transformation across industries, namely through the alignment of taxonomies, reporting requirements and climate stress-testing. As of 2019, there are over 500 pieces of legislation in the world's 50 largest economies relating to long-term value drivers, including ESG factors[7]—further policymaking is inevitable to continue clarifying requirements and ensuring structural robustness of standards. Thus, institutions must future-proof themselves and adapt to accommodate this structural pivot in how investing is carried out, with early adopters and collaborators having the advantage. Recent and prominent examples of policy response include:

  - EU Sustainable Finance Action Plan, culminating in an **EU Taxonomy Regulation** agreed in December 2019 to address environmental objectives and as a first step, defining screening and classification criteria

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[1]For example, UN PRI, Shifting Perceptions: ESG, Credit Risk and Ratings 2017

[2] For example, Derwall, J., Gunster, N., Bauer, R., & Koedijk, K*., The eco-efficiency premium puzzle*, 2015

[3] For example, Edmans, A., *Does the stock market fully value intangibles? Employee satisfaction and equity prices*, 2011

[4] For example, Statman, M., *Socially responsible mutual funds*, 2000

[5] For example, Klock, M. S., Mansi, S. A., & Maxwell, W. F., *Does corporate governance matter to bondholders?*, 2005

[6] Morgan Stanley Sustainable Investment Institute, *Sustainable Signals,* 2020

[7] PRI, *Taking stock: sustainable finance policy engagement and policy influence,* 2019

- In China, a collaboration of seven government agencies published a **systemic plan for a green finance system** in 2016, following up standards and preferential terms for green bonds in 2017 and a framework for ESG disclosures for listed companies in 2018

- **UK Government's Green Finance Strategy**, in particular the PRA's supervisory statement in 2019 on climate stress testing inclusion in its Biennial Exploratory Scenario exercise

- **Canada's Pension Benefits Act of 2016** which asserts that a pension plan must include information around the extent of ESG incorporation and how they have been incorporated, if any

- **France's Article 173-VI** is a comply-or-explain requirement on institutional investors to report on ESG criteria and climate issues, in particular contribution to addressing transition risk towards a low-carbon economy

- Australia's adoption is driven by industry, namely the **Australia Sustainable Finance Initiative**, which collaborates extensively with policy-makers in the development of a roadmap and proposals

The convergence of these factors has led to a huge increase in the incorporation of SI principles within financial markets. This growth is overtaking the general rise in assets under management generally, with the proportion of sustainably invested AUM increasing from around 22% in 2012 to 38% in 2018, with continued growth of 17% projected to 2025[8]. Notably, one in four dollars is invested sustainably in the US, which anecdotally has been slower to uptake the concepts. These also make up the majority of total assets under professional management in both Australia/New Zealand and Canada.

**Figure 2. Proportion of sustainably invested AUM relative to total managed assets 2014-2018**
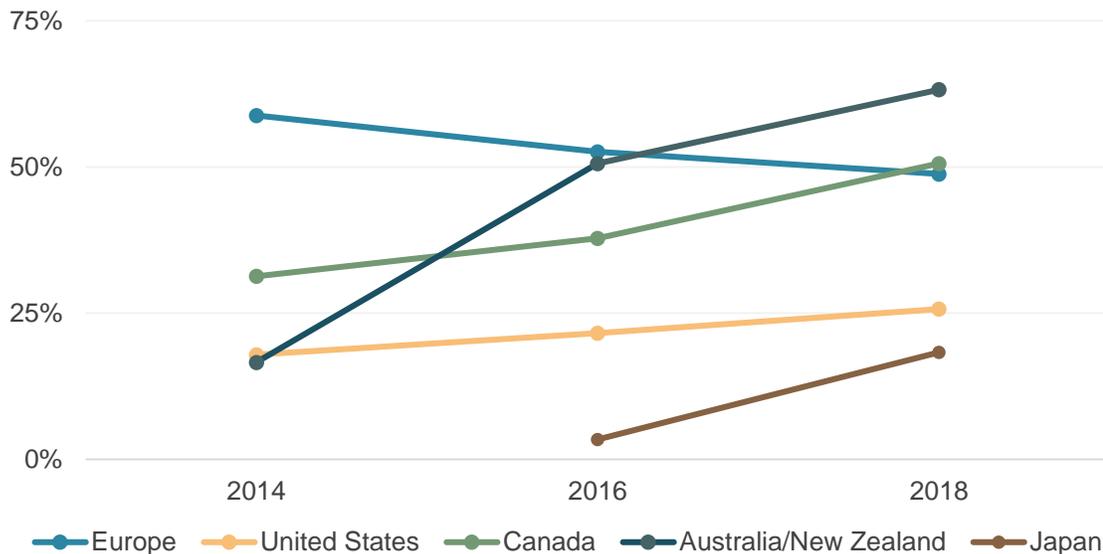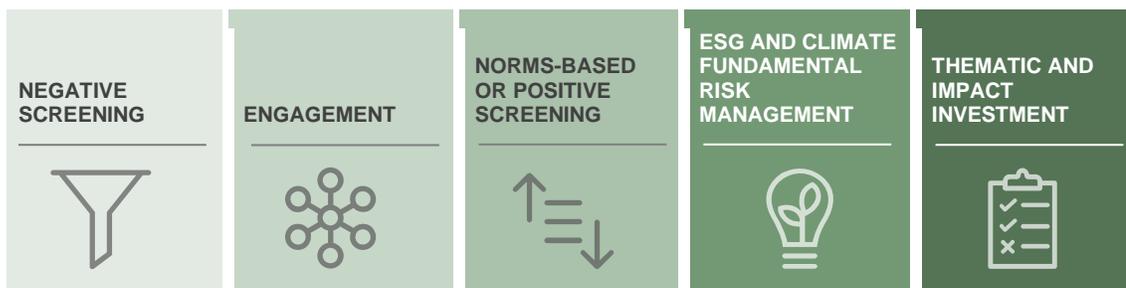


Source: 2018 Global Sustainable Investment Review, Global Sustainable Investment Alliance. Japan 2014 data unavailable.

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[8] Deloitte, *Advancing environmental, social, and governance investing,* 2020

## Approaches to application of sustainable investment principles

Sustainable investment practices are wide-ranging in terms of the extent of their application and techniques used. Methods are usually employed in combination, and are by no means mutually exclusive; they are suitable for both active or passive investment styles.

| NEGATIVE SCREENING | ENGAGEMENT | NORMS-BASED OR POSITIVE SCREENING | ESG AND CLIMATE FUNDAMENTAL RISK MANAGEMENT | THEMATIC AND IMPACT INVESTMENT |
|---|---|---|---|---|

Integration of ESG factors, screening, and engagement affect around 99% of the assets, with impact and themed investment making up the remaining 1%. Clients across the spectrum—asset owners, managers, banks and alternatives—typically incorporate sustainable investment principles through reference to ratings and research companies, and specialized internal resources.

**Negative screening** results in the exclusion of securities related to specific industries or activities that are considered inappropriate (from legal, ethical, or other perspectives), such as controversial weapons or fossil fuels. **Best-in-class selection**, also referred to as positive screening, represents an overweighting of companies or countries with superior ESG performance compared to their peers. Both negative and positive screening raise the issue of contracting the investment universe and injecting biases into portfolios; these aspects need to be taken into account accordingly.

Investors can communicate with companies or countries on ESG issues through lobbying, ownership rights (such as voting), and "voice" (as is the case for bondholders). Further, investors can also divest depending on specific issues (e.g. in order to limit exposure to certain sectors), or even exit an investment showing questionable practices altogether. These approaches are referred to as **stewardship, active ownership, voting and engagement**.

Of highest prominence are Environment, Social, and Governance factors, collectively known as **ESG**. **ESG integration** (or **ESG tilt**) represents a systematic inclusion of ESG-related matters in investment analysis, portfolio construction, and risk management. Definitions are wide-ranging, but common factors considered within these categories can be found in Table 1.

Implementation itself is also varied—managers may construct portfolios in order to achieve a certain factor or carbon threshold, or conduct research to ensure certain risks are avoided or taken into account when invested.

**Table 1. Examples of ESG factors in risk assessment.**

| ⛰ ENVIRONMENTAL | 👥 SOCIAL | ⬡ GOVERNANCE |
|---|---|---|
| • Climate change and transition risk to a low-carbon economy<br>• Resource efficiency<br>• Biodiversity<br>• Pollution | • Human rights<br>• Labor standards<br>• Diversity<br>• Healthcare infrastructure<br>• Income equality | • Government effectiveness<br>• Corruption<br>• Corporate governance<br>• International relations |

ESG can also be addressed as a fundamental part of risk management, and individual factors **quantitatively linked to financial performance and risk attribution**. As a broad example, the actual performance versus expected performance of a group or single indicator within a particular country can influence GDP in a material and measurable way, which impacts yield on sovereign debt at particular durations. Advanced models to manage this are being developed across markets but do exist in some asset classes already.

Lastly, **thematic investing** is the active and deliberate investment in assets due to their business purpose fulfilling a positive impact on society or environment, as is the case for renewable energy, clean technology, diversity and education.

It is of course crucial for most investors that a financial return is also generated alongside the positive impact. It is also usual for such an investor to set goals or targets before actually investing, the fulfillment of which is monitored during the process, followed by an assessment of whether the activity has resulted in the desired outcome. As such, the investor seeks to achieve a certain balance of social and economic return. Mainstream investors tend to measure the impact of their investments, even though they are generally not required to accept lower financial returns. All asset classes are covered by impact investing, with private equity, private debt, and bonds being no exception. Investors encounter difficulties in measuring impact, since the construction and filtering of appropriate metrics is not necessarily straightforward. For instance, finding which metrics apply to the E, S, and G components individually and collectively, or whether a "one size fits all" approach is suitable, are valid investor concerns leading to an intensification of research efforts.

The UN-published Sustainable Development Goals (SDGs) have led to the creation of **SDG investing**. This activity is still in its infancy, currently focusing on mapping corporate holdings to a selection of the SDGs. Similar to impact investing, SDG investing faces the challenge of appropriate impact measurement.

## Bodies driving change

A number of non-governmental groups are attempting to address challenges through collaboration and thought leadership. Most prominent is the signatory network to the **United Nations' Principles for Responsible Investment network** (UN PRI), set up in 2006 to support responsible investment through the implementation of six principles developed by participants. The core of these principles is the inclusion of ESG factors in investment analysis, decision-making processes, and ownership policies and practices. According to the UN PRI, many investment approaches make moral or ethical goals a primary purpose, but responsible investing can and should also be pursued by investors seeking financial performance only.

The PRI is a thought leader in the space, and aims to facilitate the migration of the global economy to a sustainable system through research and collaboration of its members. Since its foundation, the number of signatories (asset owners, investment managers, service providers) has increased significantly; Assets under management of signatories to the UN's PRI total approximately $100 trillion, with annual growth of 17% since 2010.

**Figure 3. PRI signatory and asset growth 2006-2020**
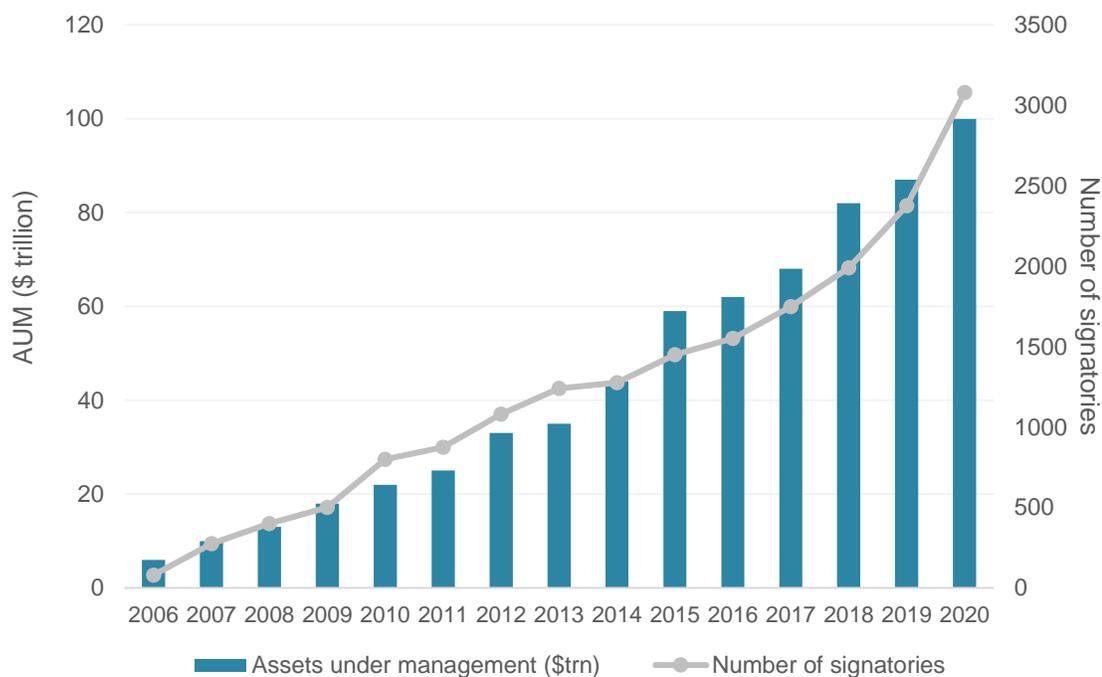


Source: UN PRI website

A second key body is the **Task force for Climate-related Financial Disclosures (TCFD),** created by the Financial Stability Board (FSB) in 2015 to establish internationally agreed-upon climate disclosure frameworks. This provided a much-needed central point around which the G20 could collaborate in structuring requirements for the inevitable transition to a low-carbon economy, and measure the financial risks arising from climate issues.

Many other bodies exist which aim to guide investors in understanding and implementing sustainable investment in practice. In fact, the numerous bodies have led to problems in themselves through the creation of hundreds of different reporting guidelines, specific to various asset classes, industries or regions.

## What next?

The clear evolution of sustainable investing from a niche to a widely adopted practice is suitable motivation for studying the effect of ESG integration on investment performance. Most academic studies approach this problem from the equity investment perspective, and assess the impact of ESG integration on corporate economic performance, cost of capital, and traded share price.

As such, getting comfortable around taking ESG factors into account during the investment process is in the best interest of the investors, since ESG issues are to be subject to increased regulation, thereby creating a latent risk for entities that disregard sustainable/responsible practices.

# Application of ESG within fixed income

Integration of ESG factors in a fixed income context has developed significantly, with an estimated half of fixed income[9] invested with an element of ESG considerations. However, it has consistently remained a laggard behind listed equity. In addition, we note that these figures are likely subject to widespread use of **greenwashing**, where there is limited actual use of ESG within decision-making but can still be labelled as such. Even within the self-selecting group of PRI signatories, nearly all (98%) apply ESG principles to equity, but only 89% to fixed income. Since 2014, the proportion of assets allocated within ESG to fixed income has not progressed, either.

**Figure 4.  Asset allocation of sustainable investments, 2014 (inner) – 2018 (outer)**
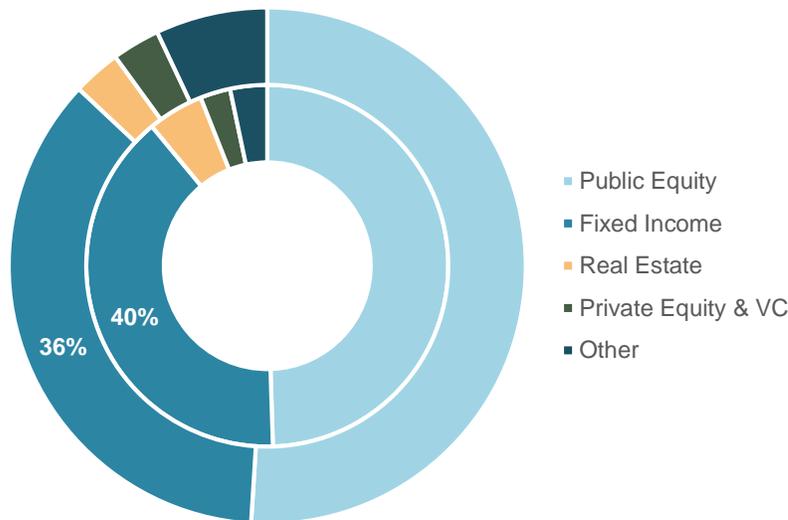


- Public Equity
- Fixed Income
- Real Estate
- Private Equity & VC
- Other

Global Sustainable Investment Alliance, Global Sustainable Investment Review 2014, 2016, 2018

# Challenges to implementation

Although improving over time, managers have found sustainability difficult to include in fixed income as a set of principles, leading to slower ESG-related change than has been observed in equities. Fixed income assets inherently possess complexities and characteristics that significantly differentiate them and make SI more difficult to implement:

- Fixed income data is more difficult to gather and compile, with issuers often only privately disclosing information, with very few issuing annual reports and disclosures as required in listed equity, and certainly not in a standardized format

- Sovereign, sub-sovereign, agency and supranational issuers fundamentally differ from corporate issuers

- Specific approaches to FI versus equity; particularities of project bonds, asset-backed securities and other instruments add to this

- Finite duration of FI assets, with much more analytical complexity than equities

- Elements such as embedded options and covenants can turn bonds into complex contracts— ESG risks can also add to this complexity;

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[9] CFA Institute, *ESG Survey Report,* 2017

Schroeder's conducted a survey involving 500 investors globally in 2017, offering a good indication of the perceived sustainable investment challenges (Figure 5).

**Figure 5.  Sustainability investor challenges.**
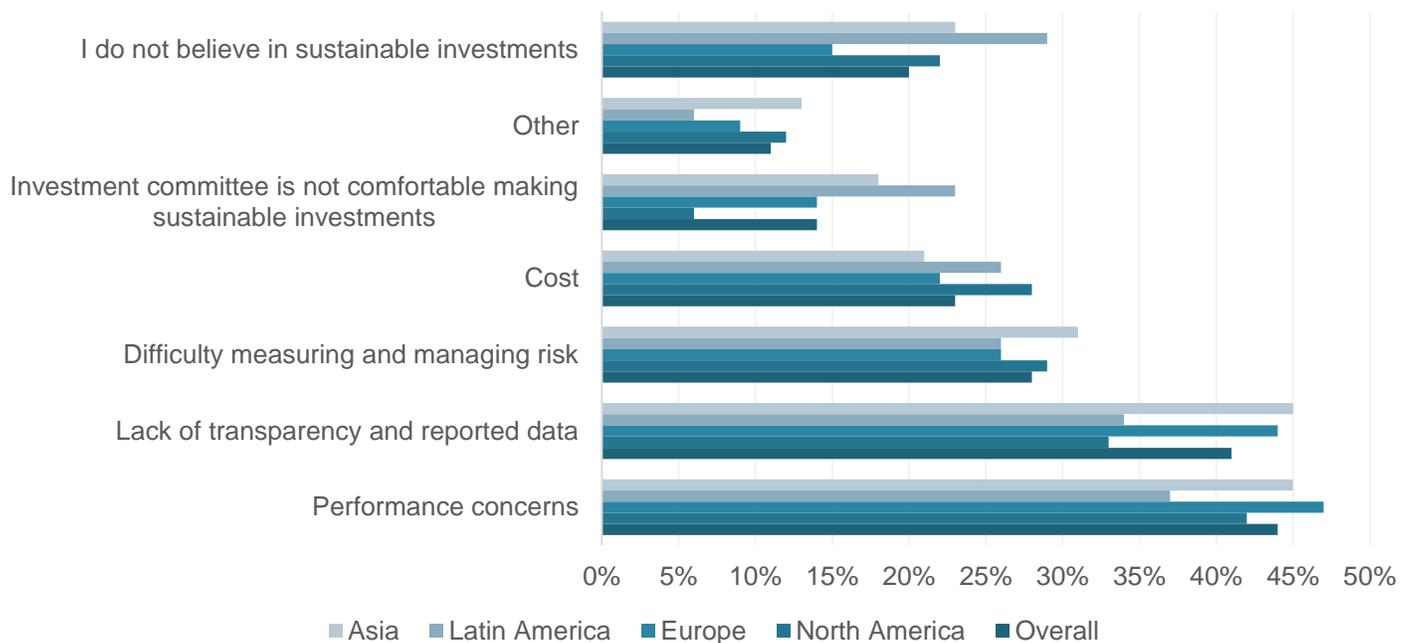
Taking these challenges into account, ESG investment strategies for equities, fixed income corporates, and fixed income sovereigns also differ. For example, negative screening has less applicability for corporate bonds than it does for equities, and even less for sovereign bonds, while best-in-class selection applies more to equities and corporate bonds than to sovereigns. Issuers and investors also differ in what is important in terms of disclosure and assessment, creating even more challenges.

Credit strength is a very important characteristic for **corporate bond issuers**; risk management and corporate governance affect perception and issue pricing significantly. Performance regarding the G component of ESG influence credit rating and the cost of debt. Similarly, the E and S components have an impact on these elements, but the underlying mechanisms vary across sectors and industries. ESG screening for corporate bonds tends to be very similar to its listed equity counterpart; however, there are significant differences in other parts of the sustainable investment process. Bondholders, not being owners of shares, lack the ability to vote— they can, however, demand transparency and engage with the issuer. Moreover, bondholders can be more powerful than equity holders in certain market conditions (e.g. when companies are buying back shares instead of issuing new ones). Corporate bond investors need to also be aware of the fact that the impact of different ESG factors on the investment risk is affected by the time frame; for example, extreme weather can have a significant impact on the short-term, while demographic changes are long-term effects.

For **sovereign issuers**, creditworthiness analysis is significantly different from its corporate counterpart regarding all ESG components. Some of the most important governance factors, in this case, are political stability, institutional strength, rule of law, corruption, and regulatory consistency. Climate change policies, and resource reserves and their management have

variable effect on creditworthiness across periods and countries. Social factors, such as labor standards, demographics, human rights, health care, and education typically have more weight than environmental ones in this case. Sustainable investment in corporate bonds is also sensitive to political factors (e.g. screening countries based on their participations in conventions or treaties). Engaging with sovereign issuers is mainly done through policy-makers, regulators, and standard-setters. Sub-sovereign bonds (issued by entities such as cities, regions, or states) require the investors to analyze ESG factors form a local and project-specific perspective.

There are additional fixed income securities that can be analyzed from an ESG point of view. In the case of **asset-backed securities**, investors need to take into account risks related to the originator, the servicer, and the cover pool of assets, and consider the possible impact of ESG on the financial sustainability of the standalone project or asset pools covering the security. **Insurance-linked securities** correspond to social investing, since proceeds can be used to rebuild communities after disasters, as in the case of catastrophe bonds. The complexity and transparency risks of other fixed income structured products makes it more difficult for the investor to conduct an ESG evaluation.

Securities with specific sustainable investment guidelines and strict requirements regarding the use of proceeds have been developed within the fixed income space. Bonds that finance projects aiming to generate social, climate, or other environmental benefits usually belong to one of the following four categories: green bonds, social bonds, sustainable bonds, and blue bonds. **Green bond** proceeds are exclusively used in activities or projects with environmental or climate sustainability goals. **Social bonds** are subject to similar quality of information requirements and principles as green bonds, the difference being that the proceeds are directed towards social programs, such as affordable housing and access to essential services (e.g. health or education). **Sustainable bonds** offer issuers broader acceptable ESG uses for the proceeds than green bonds. Marine and ocean-based projects aiming to bring economic, climate, and environmental improvements are financed through **blue bonds**.[10]

Fixed income sustainable investing still faces a number of challenges. It is more difficult for ESG data vendors to assess smaller companies than publicly listed ones—coverage is typically much lower for emerging-market corporates and high-yield bonds, compared to investment-grade corporates.

Data availability is certainly one of the major challenges of sustainable investing, and ESG data vendors typically rely on public information, since efforts to engage with the companies directly through means such as questionnaires were mostly unsuccessful. Variation in reporting standards, leading to a lack of comparability, is also an important factor. The intensification of sourcing and integration of ESG data by the investment community is making issuers more cooperative and willing to share such data, and various reporting frameworks have been put into place.

Regular updates and relevance of the obtained data is another issue to consider. Big data techniques are used in this sense, and various ESG metrics can be combined with media signals to obtain real-time updates, as opposed to relying on reporting cycles. Stock exchanges and regulators seek to improve data quality through setting corporate disclosure standards, while specialist services are working on enhancing the use of aforementioned data.

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[10] State Street, *ESG Investing; Combining performance and impact in Fixed Income*, 2018

# Application of sustainability and ESG to securitized assets

Any SI strategy in securitized assets involves taking ESG principles into account throughout or as part of the decision making process. The number of entities involved in a single securitization and data issues, among other problems, makes this very difficult in practice. However, there are key risks in the social and governance space which are crucial to understand, and highlights the importance of ESG integration efforts.

## Incorporating ESG into analysis is critical to capturing unique risks

Reasons for investors choosing to consider ESG principles in their analyses are numerous. Improvements in financial returns, reputation, or the sole motivation of "doing good" through their investment activity are all valid motivations. Looking at this issue from a different perspective, it is important to acknowledge the effects of a lackluster ESG approach through potential risks, such as governance as highlighted by the subprime mortgage crisis, the impact of extreme environmental events such as flooding, and approach to societal needs during COVID-19.

### Subprime mortgage crisis

The most prominent example for the importance of consideration of governance is of course the 2007-8 subprime mortgage crisis. In the US alone, homeowners lost $3.3 trillion in home equity, and $6.9 trillion in shareholder wealth was erased in 2008[11]. The British economy faced losses up to £7.4 trillion[12].

Alongside other factors such as low competition among lenders and deteriorating standards to access credit, predatory lending behaviors were a key cause[13], and exacerbated by lack of regulation. This mainly took the form of excessive or inappropriate mortgages, extended to borrowers who lacked full understanding or were not provided with enough information around the risks of their mortgage terms. The encouragement of excessive risk-taking throughout the market contributed to high default rates, raising them by up to a third[14].

We note that defining a loan as predatory does not necessarily depend on certain terms or features being present, but also the sophistication of the borrower. Some borrower situations do allow for non-standard features to be applied, such as where the borrower does fully understand the implications of taking on particular risks like negative amortization, or an ARM with low teaser rates and high margin later on. Whether a loan is suitable for the cash flows of a borrower must be established on a case-by-case basis. However, it is widely accepted that from 2000 onwards there was a significant expansion of subprime credit extended, with homeowners refinancing to take advantage of low interest rates only to find that they became unaffordable upon the trigger of certain economic events and house price decline.[15]

To avoid a future similar crisis and the enormous negative impact on financial markets globally, state and federal laws were amended, aiming to prevent predatory lending. However, only 25 states have implemented anti-predatory laws, which vary in strength. Within these, they were unable to explicitly define and tackle practices and instead have focussed on features such as excessive fees and interest rates.

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[11] https://www.businessinsider.com/2009/2/america-lost-102-trillion-of-wealth-in-2008?r=US&IR=T

[12] https://www.independent.co.uk/news/business/news/credit-crisis-cost-the-nation-1637trn-says-bank-of-england-1931569.html

[13] Bond P., Musto D. and Yilmaz B., *Predatory Lending in a Rational World*, 2006

[14] National Bureau of Economic Research, *Predatory Lending and the Subprime Crisis,* 2013

[15] Gerardi, K., FRB Boston, *Outcomes: Risky Mortgages, Homeownership Experiences and Foreclosures* 2007

Due to the lack of unification about standard terms and features of 'predatory' loans since the crisis, and the difficulty in justifying the implementation of a one-size-fits-all approach to a healthily functioning mortgage and securitization market, there is evidence these practices have managed to continue[16], particularly within the non-conforming loan space.

At a high level, the integration of governance aspects in risk management for investors in MBS markets to address lending practices is widespread. However, there are limited tools to analyse details and identify potentially predatory behavior at the loan level, which is key to understanding the full picture of risk management and the impact on pools and deals.

## Extreme flooding in the US

Florida, a region heavily dependent on real estate and in which a large share of the population is exposed to climate change effects, will be heavily affected by environmental aspects. To put things in perspective, 42% of the median wealth in the US comes from real estate. In Florida, real estate contributes 22% to the $1 trillion GDP, and property taxes represent 30% of local government tax revenue. Apart from these economic vulnerabilities, there are also demographic aspects at play, such as the rapid rise in building permits issuance—11% of US building permits issued in 2018 were in Florida, where 6.5% of the US population is located— and two thirds of the population live near the coastline.[17]

There are two direct impacts from sea level rise, storm surges and tidal flooding—damage has led to average annual losses of $2 billion in the Florida real estate market[17], with some counties such as St. Johns particularly exposed. Without proper adaption and mitigation, damage could increase to $4.5 billion by 2050.

Even in the absence of a destructive climate tail event in the next 30 years, the Florida economy is still affected by climate risk through asset price and insurance premium adjustments. Homes are also subject to progressive devaluation—this is estimated to increase to about $10-$30 billion by 2030, and to $30-$80 billion by 2050. Lower estate prices have multiple effects, such as reduced wealth and spending by homeowners, forgone property taxes, changes in government spending, reduced business activity and a negative impact on mortgage financing.

Measures are already being taken by Florida state in order to tackle these challenges, heavily impacting both real estate securities and municipal bonds. Zones in which beach nourishment is taking place, with $1.7 billion spent since 1980, display larger housing units and higher housing density than other areas. The Comprehensive Everglades Restoration Plan is the largest restoration investment in the US to date, at $10.5 billion, focused on ecosystem restoration for water supply and flood protection and identification of opportunities to reduce storm surge risk.

Environmental considerations such as this are clearly substantial and should form a fundamental part of any risk management strategy. In the case of flooding risks, these can be quantified to an extent in terms of financial impact within MBS, real estate, and risk managed accordingly.

## COVID-19 pandemic

The World Bank's baseline forecast indicates a global GDP contraction of 5.2% in 2020 due to COVID-19[18]—which, despite policy support described as "unprecedented," represents the deepest global recession in eight decades.

Emerging markets and developing economies are to shrink in 2020, casting many millions into poverty. For developed economies, the contraction is estimated at 7% in 2020, while for emerging markets a 2.5% decrease is expected, the worst figure since at least 1960. These developing

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[16] St Louis Federal Reserve, *The varying effects of predatory lending laws on high-cost mortgage applications*, 2007

[17] McKinsey, *Will mortgages and markets stay afloat in Florida?,* 2020

[18] World Bank, *Global Economic Prospects,* June 2020

economies are especially vulnerable due to limited access to proper sanitation, greater food insecurity, and lack of proper social safety nets.

Measures that have been put into place in order to limit virus spread and health care system stress simultaneously lower consumption, production, labour supply, and investment. These effects have spilled over to supply chains, global trade, and financial and commodity markets. Financial market volatility has reached extremely high levels, equity markets display significant losses, and commodity prices have plunged. A recent stabilization in financial markets can be attributed to large-scale macroeconomic support provided by many countries; the level of the announced fiscal policy support far exceeds the one set in place during the 2008 financial crisis.

This global crisis emphasizes the urgent need for consideration and mitigation of risks to society from pandemics, from both a health and livelihood point of view. In a mortgage context and in the absence of forbearance schemes, we observe a much higher likelihood of default and uncertainty in the extension of credit. Even with the $2.2 trillion forbearance package to provide relief to homeowners with government-backed mortgages, the effects on securitized markets are severe. If not federally backed, servicers are temporarily absorbing losses and the ongoing impact is yet to be observed.

These examples across Environmental, Social and Governance serve to show that SI principles a key role in the management of the impacts of a very broad range of adverse events and contexts.

## Unique challenges of sustainability incorporation to securitized assets

From an ESG analysis perspective, securitization leads to a unique set of challenges: the **complexity** of securitized assets due to their nuanced history and involvement of multiple parties, **opacity,** relating to the unavailability of data regarding the parties involved in securitization, and **objectivity** due to the lack of third-party ESG score providers.

The complexity challenge is inherent in the construction of a securitization itself. A securitized asset issuer's relevance to the transaction is not its management team, employees or environmental impact, and does not represent all of the risks within any securitization—this is, of course, very different from the case of equities or bonds.

Therefore, it is required for the ESG framework to be extended in order to cover all the related parties: the issuer, the originator (responsible for asset creation), the sponsor (asset selector), the trustee (enforcing rights, remitting payments), and the servicer (asset maintainer). There are many nuances to explore in this intricate network, rendering the problem more complex than a simple mapping of ESG criteria to each actor.

**Figure 6.  Typical structure of a mortgage securitization**
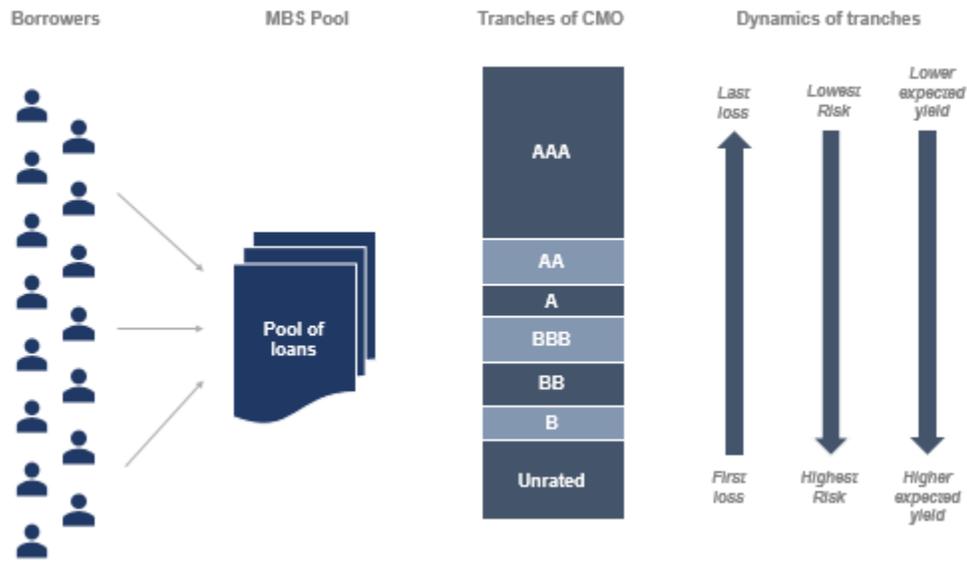


ESG analyses typically rely heavily on publicly available information. This is especially problematic for businesses financed through securitizations, as they can often be private entities, not subject to transparency guidelines or requirements to report in a similar way.

Investors also need to work with non-standard information, since ESG score providers for securitized assets are scarce. Not having the option of objective ratings, investors are faced with the challenge of developing proprietary ESG scores, with implicit subjectivity and debatable impact on investment results.

In addition, there is difference in perception on what is best practice in terms of integration, and guidelines are still be developed by industry bodies. Therefore no clear requirements for data requirements from the various participants involved, or ratified methodologies that allow us to link ESG to financial returns.

This paper addresses the need for deep understanding of how to tackle such a complex range of issues and ensure that robust risk management practices can be undertaken.

# ESG framework for securitized assets

As mentioned above, application of ESG in a securitized context is complex, and different factors are relevant for different investment purposes. ESG risk integration can occur at both **transaction** and **collateral** level; occasionally, it can occur at a **deal structure level** as well.

We have developed a framework for the assessment of ESG across Environmental, Social, and Governance factors to address the need for a consistent and holistic view of ESG within securitized products, including but not limited to the below (Table 2). Different actors can attribute different weights to these, depending on their goals.

**Table 2. Examples of ESG factors in risk assessment**

|  | ENVIRONMENTAL | SOCIAL | GOVERNANCE |
|---|---|---|---|
| **Collateral level** | • Energy efficiency levels<br>• GHG Emissions<br>• Source of power generation | • Affordability and support of homeownership in low/middle income families and first-time buyers | • Responsible versus predatory lending behavior<br>• Responsible versus predatory servicing behavior |
| **Transaction level** | • Purpose of investment<br>• (e.g. green CMBS, Solar, Auto ABS) | • Purpose of investment (e.g. affordable housing at preferential rates, VA) | • Transparency of management<br>• Executive practices and compensation |

Source: Yield Book

For many market participants, Social and Governance factors have been part of a typical risk analysis framework but not labelled as such. In this paper we focus on measurement of predatory lending and predatory servicing behaviors that impact portfolios, stripping this out of overall analysis so that behaviors can be looked at in isolation and help clients quantitatively assess key thematic risks.

In order to provide advanced analytics, Yield Book has been collecting data (particularly in the Agency RMBS space) for decades, and is in a strong position to address client need in this area. The granular historical data regarding MBS allows Yield Book to develop unique insights and assist with quantitative-based integration of ESG into the analysis of securitized products. These metrics aim to assist throughout the entire investment process, and are computed separately for both lenders and servicers.

Some key characteristics of the Yield Book ESG integration into the assessment of securitized products are:

- Purely quantitative approach
- Hypotheses tested through 20y + historical data on RMBS
- First available metric in the market
- Flexible universe for scores and rankings; can be calculated at deal, entity or portfolio level
- Consistent methodology across agency and non-agency

We have focussed initially on provision of the following metrics to help clients with assessment of key thematic risks within the areas of 'S' and 'G', which can be calculated at a deal, lender or portfolio level:

**Responsible Lending**

**Responsible Servicing**

Lender behavior scores

Unfair borrower rates

Irresponsible lending behavior

Eventual borrower default

Servicer behavior scores

Aggressive Delinquency

High fees
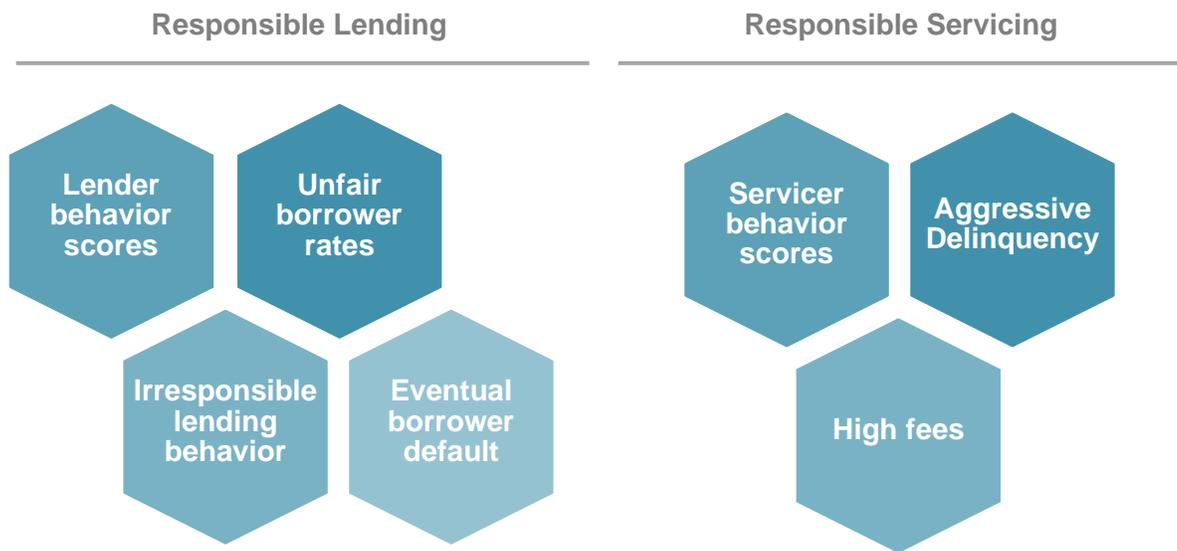
Source: Yield Book

These metrics are aggregated into both scores and rankings for both Predatory Lending and Predatory Servicing, against a universe of similar loan cohorts such as conforming, Jumbo and sub-prime loans, as well as within deals or client-defined portfolios.

# Responsible lending methodology
## Overview

In the assessment of responsible lending behaviors, we first define predatory behavior in a lending context. This is characterized through the extension of unfair terms on a borrower during the loan origination process. In particular, this occurs where a borrower has unfair loan rates extended where the borrower can reasonably expect that it will not be affordable in the future, complex features or low regard to risk management. In contrast, non-predatory situation, the lender earns a reasonable and customary fee, while the borrower gets the best product for their needs.

We make a key distinction between predatory behavior and provision of risky loans in a non-predatory context. Particular terms may be non-standard or present a high level of risk, but may be appropriate for a sophisticated investor or a borrower with non-regular cashflows. For example, negative amortization features may be predatory when a borrower does not understand the risks of an increasing overall loan amount, but ideal for one with non-regular cashflows or with expected upcoming lump sums. An ARM with a very low teaser rate but high margin of 8% may be viewed as predatory for a 'standard' borrower and is in fact illegal in some states, but for a sophisticated borrower managing high short-term cashflows, this may be ideal.

Yield Book provides quantitative-based metrics related to these aspects, with the aim of highlighting and measuring the extent of the predatory behavior. These metrics are used for the construction of lender scores and rankings, which can be used for deal comparison or versus universe within market segment.

# Unfairly high loan rates

In theory, borrowers with similar credit profiles and loan requests should expect to obtain similar loan rates. However, this is often not the case, with a borrower at a particular lender typically being offered a higher loan rate than other similar borrowers in comparable contexts in terms of Fico scores, DTI and LTV in particular. This behavior indicates a higher likelihood of predatory practices being prevalent.

Yield Book compared the market benchmark of locked-in mortgage rates[19] to loan rates as of the month of mortgage issuance in order to assess whether it is justifiable at a 95% confidence interval. Loans with unjustified high rates are thus identified, and the lenders with high occurrences of these are flagged as significant and result in a lower performance score.

Using sample data on 1,000 conforming loans from 2018, we examine differences between the loan rate extended to the borrower, and the benchmark. We find 33 loans of interest which lie outside our confidence interval; these flagged loans can be aggregated by lender, to provide indication of who the most risky lenders are in the cohort.

**Figure 7. Identifying loans at high risk of predatory behaviors**
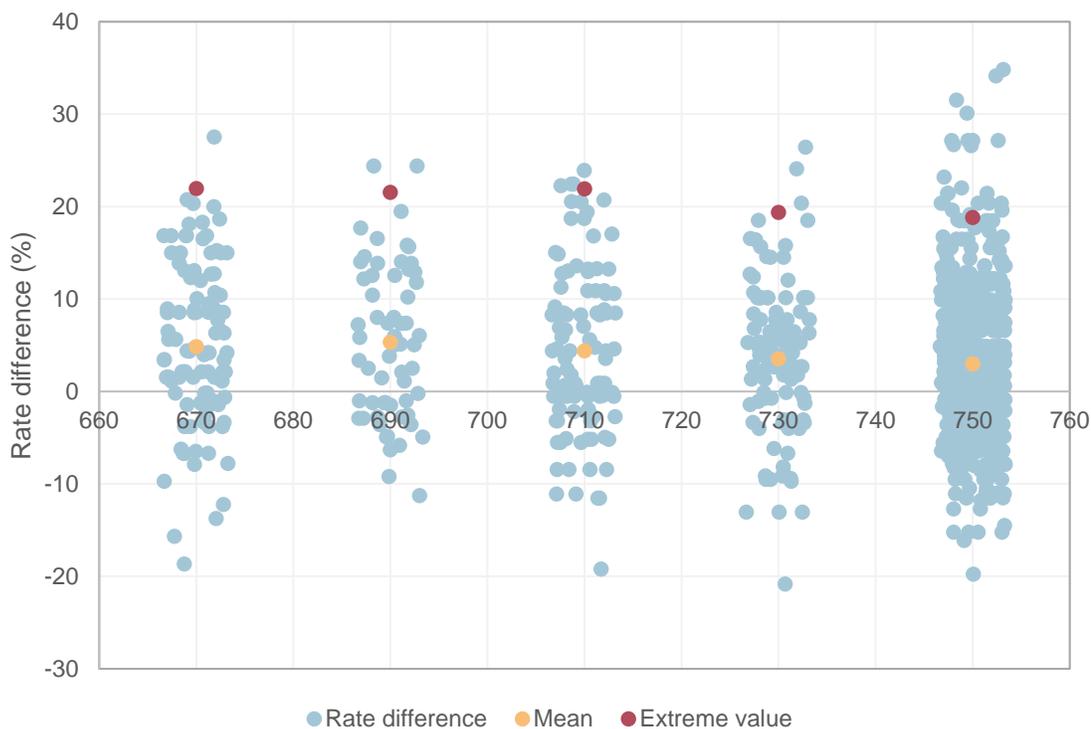


Source: Yield Book

This analysis can also be conducted on non-conforming data using an equivalent benchmark of locked-in mortgage rates, to identify loans with unjustifiably high rates. Clients can easily compare deals and expected behavior, and observe which lenders display more extreme lending behavior than others. We see from the above graph that there are loans that should be investigated even in agency deals.

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[19] Optimal Blue Mortgage Market Indices

# Unnecessary loan features

Features such as Adjustable Rate Mortgages (ARMs) or prepay penalties are features often found in the non-conforming loan space, and crucial tools for sophisticated borrowers to be able to obtain credit for bespoke requirements. However, we can flag where features like this are part of the loan terms with no reasonable justification to borrowers that generally have more straightforward requirements—such as first-time buyers, or single family who are refinancing. Lenders that impose these features on these borrower types can be considered at a higher probability of engaging in predatory lending.

On a wide sample set of 79,000 non-conforming loans originated pre-crisis, we found ~0.8% with various features defined as predatory – the lenders that extended these can be seen in Figure 8, with anecdotal evidence validating our results.

**Figure 8. Identifying non-conforming loans at high risk of predatory behaviors**
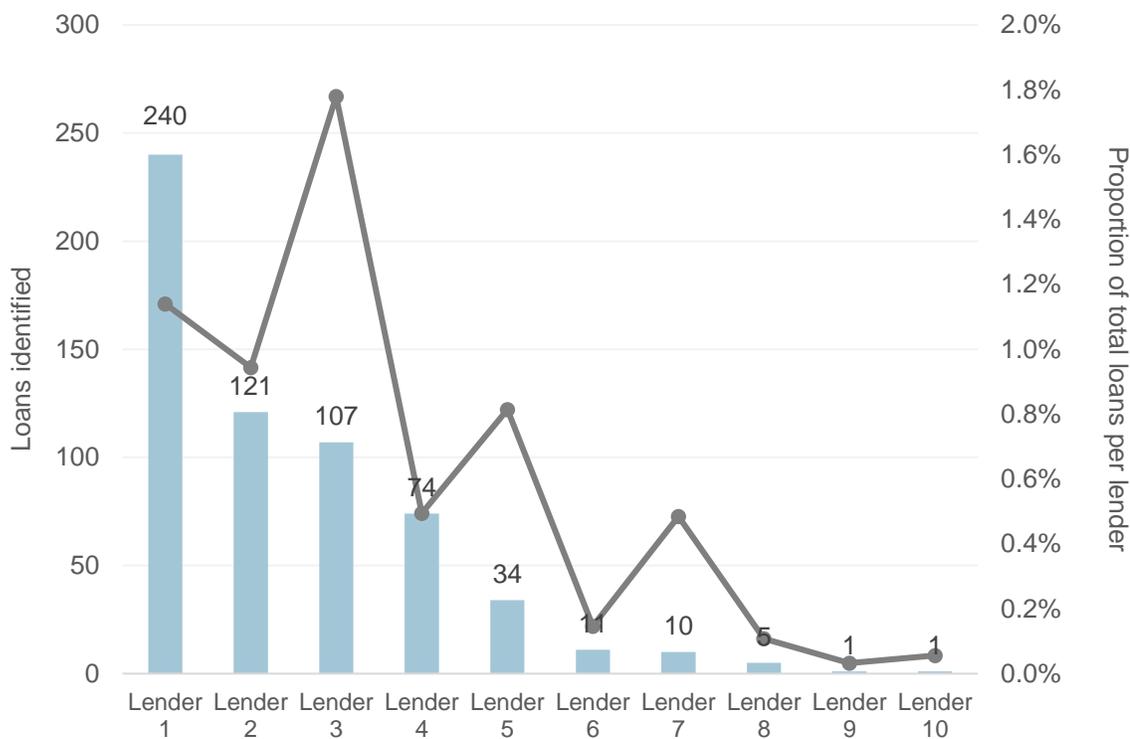


Source: Yield Book

# Irresponsible lending behavior

Irresponsible lending, a predatory behavior on the part of the lender, is defined by the consistent offering of loans to borrowers that we find were not subjected to proper affordability checks. This results in the borrower facing default risks, falling behind on existing commitments, and causing financial hardship.[20] This predatory behavior expressed in loans with poor credit is identified by looking at the consistent extension of credit to high-risk borrowers relative to other lenders either within a deal or market segment.

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[20] https://www.stepchange.org/debt-info/your-rights/irresponsible-lending-and-affordability-checks.aspx

We note that lending to risky borrowers is not predatory—this is of course required for healthily functioning markets—but is an issue to be highlighted if this occurs over a long time period, and consistently. Our definition for a risky loan depends on LTV, DTI and Fico score.

In a sample of loans from a sub-prime shelf of deals from 2006, we found that some lenders are over-represented in terms of consistent extension of credit to riskier borrowers. Figure 9 shows the level to which lenders are overrepresented in the sample set of loans—a score above 1 means that the lender extended a higher proportion of risky loans than the mean, and the size of the bubble indicates the total number of loans in the entire set extended by that lender. Therefore, Lender 2 and Lender 6 are particularly of interest, due to the high number of loans they have in the set, and that they are over-represented in terms of riskiness. Results are consistent with NAACP filings in regard to predatory lending through 2007[21], all of whom were included. In fact, Fremont was repeatedly warned by the Attorney General's office regarding predatory practices[22], and in 2007 was ordered to cease and desist before formal charges were presented by the State. Shortly afterwards in June 2008, bankruptcy was announced[23]. Option One is also the subject of numerous publicized settlements regarding predatory lending[24].

**Figure 9. Lenders with consistent risky credit extension**



Source: Yield Book

[21] https://www.naacp.org/latest/naacp-files-landmark-lawsuit-against-major-home-mortgage-companies-for-discriminatory-lending/

[22] https://casetext.com/case/commonwealth-v-fremont

[23] https://labusinessjournal.com/news/2008/jun/18/fremont-files-for-chapter-11-protection/

[24] https://www.sec.gov/litigation/complaints/2012/comp-pr2012-76.pdf
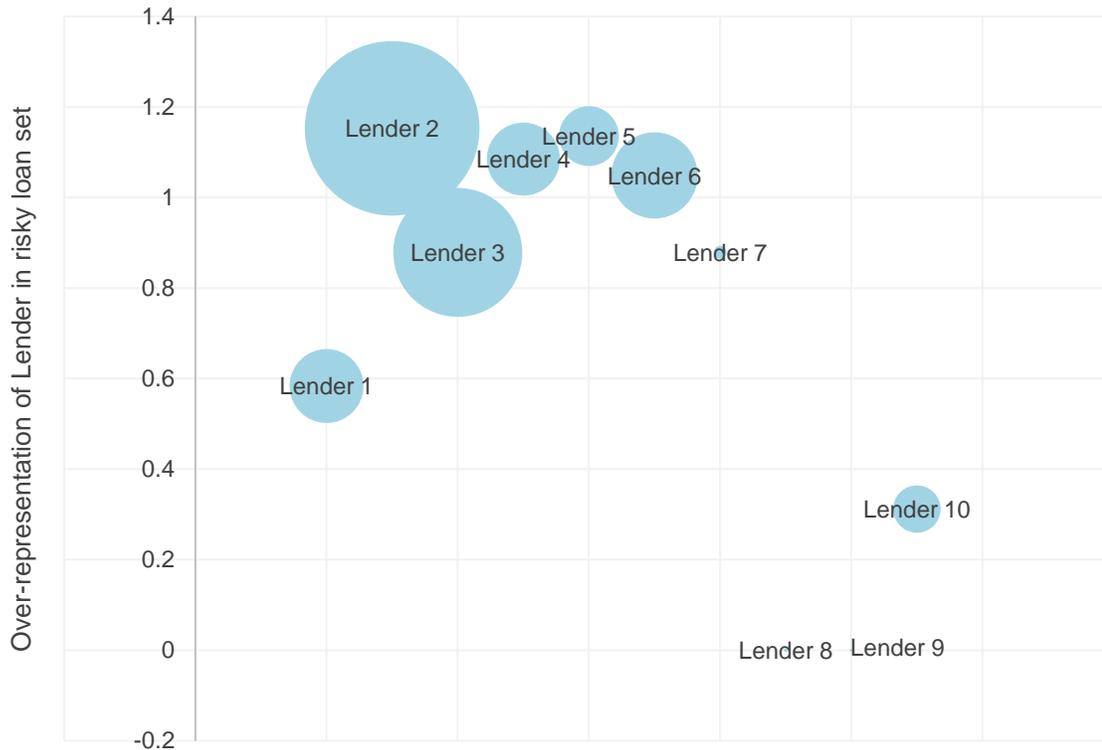
# High eventual default rates

Where loans extended by a particular lender experience significantly high default rates versus peers, we can deduce that credit extension was consistently extended to borrowers irresponsibly. This signals a high likelihood of predatory behavior on the lender's part through the offering of inappropriate terms. We can calculate default rates of a lender which were originated as of any particular year against a universe of loans by market segment, within a portfolio or a deal.

Clients can inspect default rates per lender to understand whether the originator is extending credit to borrowers unlikely to be able to repay their mortgage. This can be applied to investment behavior through understanding of which lenders are consistently extending risky credit and whose loans are more likely to default, and through positive investment in lenders who do not engage in risky loans which are eventually unmanageable for borrowers.

For example, in the below anonymized results we compares default rates per year in a sample set of non-conforming, non-ARM loans. Questions to investigate could be the behavior of Lender 1, and investigate both why the rate of default of loans originated in 2019 are significantly higher than peers, and why this increased since 2017.

**Figure 10. Cumulative default rates of lenders by originated year**
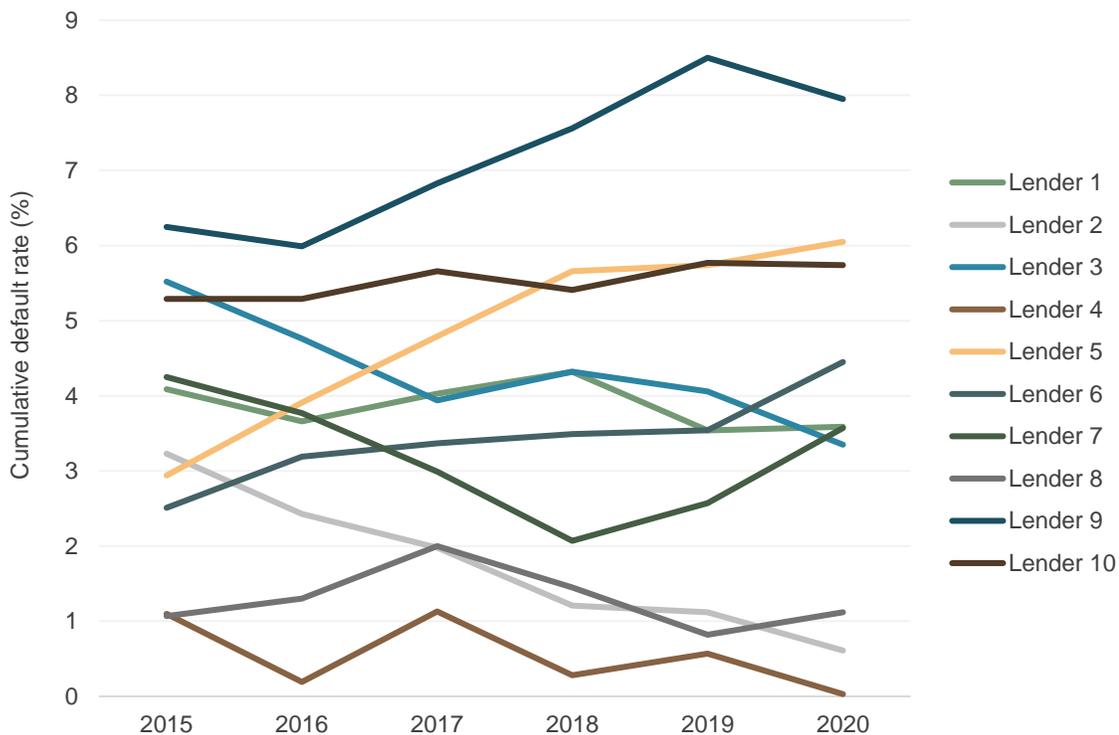


Source: Yield Book

## Responsible lending scores

The above metrics are then normalized and aggregated with equal weighting into both scores and rankings per lender. The universe against which scores and rankings are provided is flexible, and can be defined as a deal, a portfolio or a relevant market sub-segment, for example rankings within Jumbo loans. These can then be used for individual lender comparison for the purposes of engagement or optimization of a portfolio, or aggregated for comparison at a deal or portfolio level.

**Table 3. Responsible Lending scores and rankings in a sample universe of loans**

| Lender | High loan rates (% of total loans) | Complex loan features (% of total loans) | Risky lending behavior (x1) | Eventual default rate (% of total loans) | Score | Ranking |
|--------|------------------------------------|-------------------------------------------|------------------------------|-------------------------------------------|-------|---------|
| Lender 1 | 0.7% | 1.1% | 0.58 | 3.94 | 49.2 | 4 |
| Lender 2 | 0.1% | 0.9% | 1.15 | 3.85 | 50.4 | 3 |
| Lender 3 | 0.6% | 2.2% | 0.88 | 4.07 | 42.9 | 5 |
| Lender 4 | 0.4% | 0.5% | 1.08 | 0.54 | 54.6 | 1 |
| Lender 5 | 0.3% | 0.8% | 1.14 | 1.27 | 52.8 | 2 |

Source: Yield Book

# Responsible servicing methodology

## Overview

Predatory servicing occurs after loan origination, defined by deceptive, unfair, abusive, or fraudulent mortgage servicing practices. While there is no explicit law and definition for predatory servicing, there are various levels of legislation in place that target specific aspects of predatory behavior; however, some practices remain more difficult to detect.

Yield Book has the capability of collating information regarding the below predatory servicing behaviors into servicer scores and rankings for deal comparison or within market segment, as per our approach to measuring predatory lending.

## Aggressive default practices

Predatory servicing can be approached from the perspective of the servicers' practices around helping borrowers out of difficult financial situations. Yield Book's database enables the quantification of the aggressiveness of these default practices through analyzing the average time between delinquency and application of defaulted status.

Clients can inspect typical delinquency rates per servicer, using original (at issuance) constituents of a portfolio. This can be compared to other servicers to establish which have more responsible and facilitative behavior when dealing with delinquencies. In addition, the portfolio can be grouped into delinquency buckets to enable profiles of different servicers to be compared.

**Figure 11. Assessment of average delinquencies per servicer**
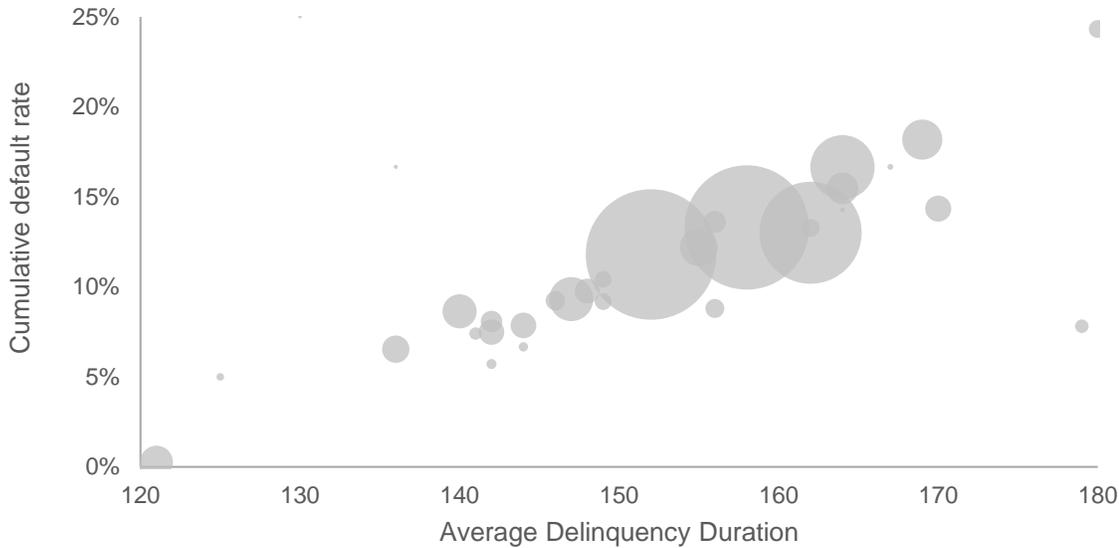


Source: Yield Book

# High fees

Unreasonable fees for a servicer can also be identified through peer analysis; identification of loans within a portfolio or deal with very high fees over a threshold that could indicate predatory servicing. In a sample of non-conforming loans over 2006-2020 we see that fees are relatively stable, but distribution of fees can be wide. The limit for fees to be labelled as predatory in terms of legislation note 3% of the original balance[25].

**Figure 12. Fee distribution of servicers across sample universe of loans**



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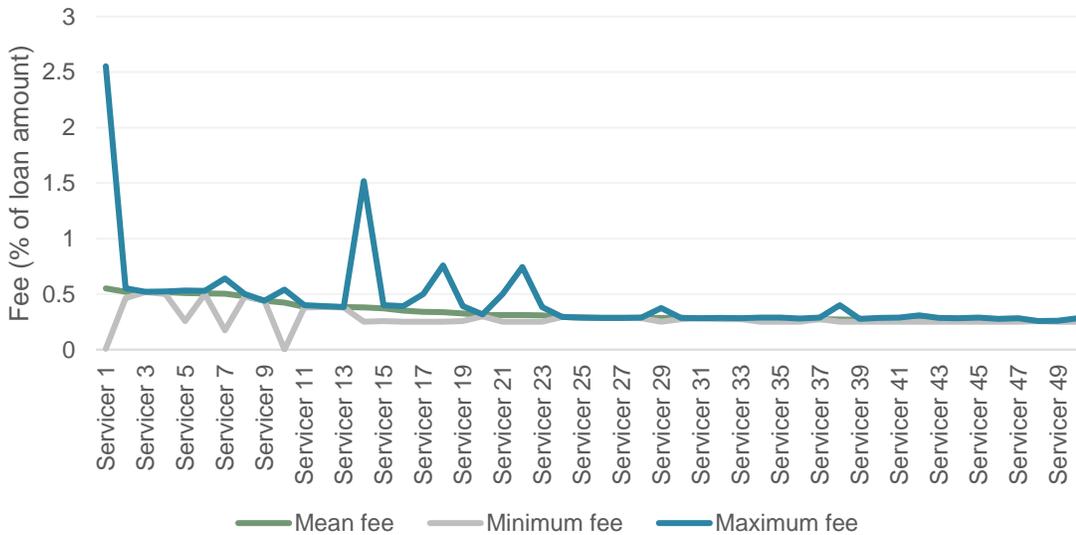
[25] Pennington-Cross, A., Ho, G*., Predatory Lending Laws and the Cost of Credit*, 2007

## Source: Yield Book Responsible servicing scores

As with lending in the previous section, the above metrics are then normalized and aggregated into both scores and rankings per servicer, with weightings of 75% and 25%. Again, the universe against which scores and rankings are provided is flexible and can be user-defined.

**Table 4. Responsible Servicing scores and rankings in a sample universe of loans**

| Servicer | Responsible Delinquency policy (average days) | Fee policy (%) | Score | Ranking |
|---|---|---|---|---|
| Servicer 1 | 62 | 0.55 | 46.0 | 5 |
| Servicer 2 | 60 | 0.52 | 55.1 | 1 |
| Servicer 3 | 26 | 0.52 | 48.8 | 3 |
| Servicer 4 | 44 | 0.52 | 53.0 | 2 |
| Servicer 5 | 5 | 0.51 | 47.0 | 4 |

Source: Yield Book

# Predatory behaviors in the context of COVID-19

## Forbearance patterns

As discussed above, COVID-19 has had a huge impact on health and livelihoods, in particular the ability to fulfil obligations on mortgages. The widespread income risk of families led to over $600 billion of the total $2.2 trillion CARES Act relief package being dedicated to individuals, in particular forbearance schemes as well as unemployment payments or student loans[26]. In order to ease the financial burden while employment is scarce, homeowners may delay or reduce repayments to their federally or GSE-backed mortgages until December 31, 2020, and may request an additional 180 or 360 days.

In terms of non-government backed mortgages or private loans, forbearance options for the borrower fully depend on the servicer[25], potentially leading to risk of exploitation of the borrower through lack of options. In particular, those borrowers who have non-conforming loans are usually directed there due to their credit history or non-standard loan requests, which already put their affordability status more at risk.

We also note that due to the few requirements on borrowers to prove need for forbearance—to allow as many as possible to access emergency funding where needed—this also could allow the option to be used by those who do not strictly require it, potentially putting further stress on servicers.

## Impact of predatory behavior on reactions to forbearance

The current situation is unprecedented in scale, and the ongoing impact to all participants in the mortgage value chain is unknown. Once support is withdrawn for forbearance policies, many homeowners may still be in a position of unaffordable repayments or have to undergo restructuring.

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[26] www. consumerfinance.org/coronavirus

The above scores and metrics can be used to facilitate understanding of which lenders and servicers will react in a responsible manner to the difficulties faced by borrowers. Although servicers are required to work with borrowers to avoid foreclosure, servicers with a history of aggressive pursuit of default after delinquency—as measured by the average duration of delinquency—are more likely to move towards foreclosure quickly and less likely to meaningfully attempt a route with loss mitigation. Servicers with historically lower default rates within particular segments and features are more likely to attempt restructuring to make loans more affordable.

Additionally, those servicers with a higher score on responsible servicing behavior are more likely to work with holders of non-federally backed loans in a reasonable and meaningful way though the coronavirus pandemic. They may be more likely to avoid aggressive reactions to the end of forbearance, such as requiring the entire unpaid lump repaid as soon as the pause period is over, or even offer forbearance as an option in the first instance. As the stress on servicers is high to continue provision of services, understanding this behavior is key to mitigating risk in this area.

## Conclusion

As further understanding of the principles of Sustainable Investment and ESG grows in asset classes beyond listed equity, market participants must ensure they are prepared for widespread demand from asset owners, drive from policy and the subsequent implementation. Within securitized assets, we see it is a key area of importance to understand for full risk management purposes, despite the complexity, lack of framework and difficulty in data sourcing.

Detection of responsible lending and servicing behaviors is key to understanding full dynamics of the market, particularly in the current state of the market where uncertainty due to COVID-19 is widespread. The mitigation of risks from predatory behaviors is facilitated through the use of the above metrics to understand underlying drivers of default and prepayment, and allows a quantitative basis from which engagement can be actioned.

## About Yield Book

Yield Book is a trusted and authoritative source for fixed income analytics that enables market makers and institutional investors to perform complex analysis of their portfolios, benchmarks, trading decisions, historical performance, and risk. Yield Book products offer analytical insight into an extensive range of financial products in the fixed income space including governments, agencies, corporates, high yield, emerging markets, mortgages, ABS, CMBS, CMOs, and derivatives. The platform utilizes dedicated centralized servers that help ensure reliable, prompt data delivery. Yield Book forms part of London Stock Exchange Group's Information Services Division, which includes FTSE Russell, a global leader in indexes.

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