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With New Securitization Products, Green Finance Grows Up

Regulators and investors are driving a growing demand for sustainable investment products. Traditional sustainable investment options include equity investments in companies that perform well on sustainability measures and instruments such as green bonds, which raise capital for climate and environmental projects. As the sustainable finance sector matures, however, sophisticated new securitized products are emerging, enhancing the diversity of the sustainable finance market.

In response to growing investor demand, global asset management giant BlackRock announced in January that it would be overhauling its strategy to focus on sustainable investment. BlackRock's announcement drew fresh attention to the rapidly growing sustainable finance industry.

As the risks posed by income inequality, climate change, and resource depletion become evident, investors have been shifting capital into sustainable investment products, including equity funds focused on companies that perform well on environmental, social, and governance (ESG) measures and other socially responsible investment (SRI) options.

As assets under management with a sustainable mandate have grown, investment options have proliferated. Today, there are many equity indices and funds focused on companies with strong ESG characteristics, and many governments and companies are issuing green bonds and other green financing instruments.

One area that has, however, remained relatively underdeveloped is sustainable securitization.

Securitization is an essential component of the modern financial system. It lowers costs for borrowers and offers investors potentially attractive returns, helping to attract fresh capital. Yet sustainable securitization products have been slow to emerge because the sector faces unique challenges.

What is Securitization?

Securitization is a financial process. It involves taking a pool of assets – mortgages or credit card receivables, for example – and pooling them to create a security that can be sold to third-party investors, who then receive the cash flows generated by the underlying assets.

Securitization enables loan originators to reduce their credit risk exposures by selling on the debt they originate. It can reduce funding costs, as the collateralized debt used in securitization may be less risky than the originator's unsecured debt and may thus attract better rates..

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One such challenge is that securitization involves multiple parties and it is not easy to determine which party should be evaluated from an ESG or sustainability perspective. For example, the assets underlying a particular security may be sustainable, but the originator may have a poor ESG record. There are no established standards to say whether such an instrument should be considered sustainable.

Another challenge is that every securitized product is unique, which makes it difficult to develop broadly applicable standards for assessing the sustainability credentials of these products. Even in the less-complex world of equity investing, there are dozens of rival standards for assessing the ESG performance of individual companies, and their conclusions do not always agree. This problem is significantly more complex for securitized products, with their multiple parties, complicated structures, and unique underlying assets.

Despite these challenges, however, efforts are underway to grow the sustainable securitization market.

One rapidly developing area is the creation of asset-backed securities (ABS) using sustainable assets. The market for solar ABS – instruments backed by loans used to finance the installation of solar energy systems – is relatively well developed, for example.

So-called PACE bonds are another popular source of sustainable assets for securitization. Property Assessed Clean Energy (PACE) financing programs in California, Florida, and Missouri allow homeowners to fund weatherizing or renewable energy renovations using money from the sale of PACE bonds, which are then repackaged and sold as PACE ABS.

Even auto manufacturers have entered the sustainable ABS market – Toyota has created green auto ABS using auto loans issued to finance the purchase of hybrid, electric, and fuel-efficient vehicles.

Total Outstanding ABS (USD billions)

- PACE Bonds ABS: $3.1
- Solar ABS: $5.2
- Auto ABS: $4.6
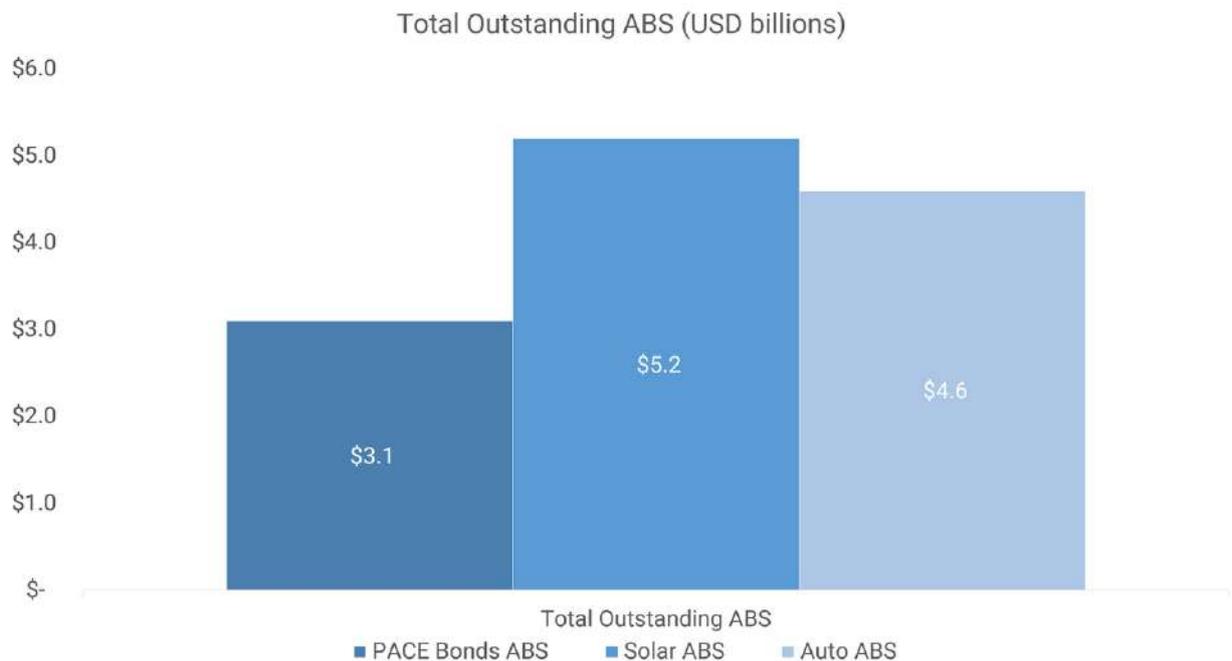
Source: ESG & Securitization: Early Days. Deutsche Bank.

Another emerging area is sustainable collateralized loan obligations (CLOs). CLOs are special purpose vehicles (SPVs) that house pools of leveraged loans. In Europe, fund managers are creating ESG-compliant CLOs focused on leveraged loans of companies with strong ESG practices. New green CLOs, focused on the loans of companies that are engaged in improving the environment and fighting climate change, are forthcoming.

There is also a growing market for sustainable commercial mortgage-backed securities (CMBS) and residential mortgage-backed securities (RMBS), although defining which of these MBS instruments qualify as sustainable can be complex.

The world is engaged in significant financial transition. Trillions of dollars in capital will be needed to finance climate change adaptation and mitigation and to ensure a sustainable and prosperous future, and innovative and creative financial solutions will be necessary to meet this need. Sustainable securitized products will be an essential part of the process.

Intuition Know-How has a number of tutorials that are relevant to securitization and sustainable investment:

- ESG & SRI Investing
- Securitization – An Introduction
- Securitization – MBS Types & Risks
- Securitization – US MBS
- Securitization – US Non-MBS
- Securitization – Prepayment Risk
- Securitization – Credit Risk & Ratings
- Securitization – Pricing & Analysis
- Securitization – CDOs

Disruption in Financial Services

Racist Robots? How AI Bias May Put Financial Firms At Risk

Artificial intelligence (AI) is making rapid inroads into many aspects of our financial lives. Algorithms are being deployed to identify fraud, make trading decisions, recommend banking products, and evaluate loan applications. This is helping to reduce the costs of financial products and improve their efficiency and efficacy. However, there is growing evidence that AI systems are biased in ways that may harm consumers and employees. As regulators turn their attention to the impact of financial technology on consumers and markets, firms that deploy AI may be exposing themselves to unanticipated risks.

Every day, thousands of people receive automatic fraud alerts from their credit card companies informing them of suspicious transactions. What many don't realize is that behind those alerts lies an AI – an algorithm that searches and evaluates billions of credit card transactions, identifying normal spending patterns and flagging transactions that may be out of the ordinary. Fraud alert AI represents just one of the many ways in which AI is being woven into the day-to-day business of finance.

What is AI?

At its core, AI is simply the attempt to teach machines to imitate or reproduce human beings' natural intelligence – the ability to recognize objects, make decisions, interpret information, and perform complex tasks.

The advantages of creating AI systems capable of performing functions like fraud monitoring, customer service, trading, and transaction processing are obvious. Well-designed and effective AI systems can reduce errors, increase speed, and cut costs by reducing the need for human workers. They can also provide firms with a competitive edge and enable faster growth and the development of new products.

However, AI is not risk-free. On the contrary, the fundamental structure of AI creates a host of risks and vulnerabilities.

How does AI work?

Attempts to replicate how human brains acquire and interpret information have been largely unsuccessful. Researchers have therefore turned to other methods to create effective AI. A traditional approach has been to use huge amounts of data to teach machines how to perform tasks.
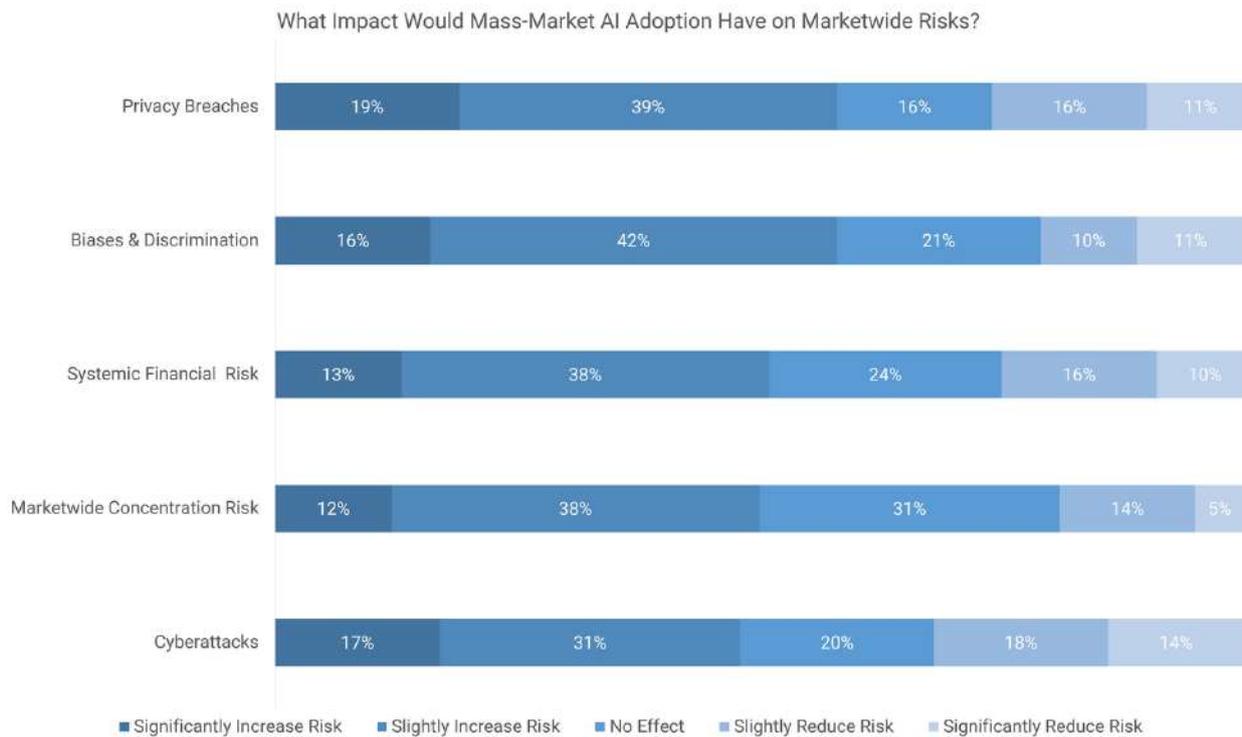
Consider, for example, image recognition. Human toddlers can quickly learn to distinguish between pictures of cows and horses, but machines historically struggled to do so because the animals are too similar. However, researchers found that by showing algorithms millions of images of cows and horses – and telling them which was which – over time, they could train the algorithms to accurately tell whether a new picture showed a cow or a horse. This basic technique can be used to train applied AIs to perform a range of tasks. For example, to train a fraud monitoring AI, the algorithm can be provided with transaction data and told what a suspicious transaction looks like. After a while, it will be able to identify suspicious transactions based on the parameters it is given.

A more contemporary approach, known as machine learning, is to provide algorithms with basic programming and a huge trove of data – pictures of cows and horses, say, or credit card transaction data – and allow them to train themselves. Over time, the algorithm figures out how to group images into categories or identify transactions that do not fit the general pattern, thus teaching itself to recognize images or identify fraudulent transactions.

Big breaches and biased bots

This reliance on data and programming creates the risks inherent in AI. First, the accumulation of huge troves of data creates a security vulnerability. A World Economic Forum survey of financial firms found that 58% of respondents believed that AI adoption would increase the risk of major privacy breaches. Hackers frequently target financial firms' databases and major data breaches can be costly – they may lead to reputational damage and sizeable fines.

What Impact Would Mass-Market AI Adoption Have on Marketwide Risks?

	Significantly Increase Risk	Slightly Increase Risk	No Effect	Slightly Reduce Risk	Significantly Reduce Risk
Privacy Breaches	19%	39%	16%	16%	11%
Biases & Discrimination	16%	42%	21%	10%	11%
Systemic Financial Risk	13%	38%	24%	16%	10%
Marketwide Concentration Risk	12%	38%	31%	14%	5%
Cyberattacks	17%	31%	20%	18%	14%

Source: Transforming Paradigms: A Global AI in Financial Services Survey. World Economic Forum.

There is also a more insidious risk. By relying on programmers or existing pools of data to train AIs, firms risk baking existing prejudices into their algorithms. Indeed, 58% of respondents to the World Economic Forum survey expect AI adoption to increase the risk of bias and discrimination in the financial system.

Consider, for example, a hypothetical US bank creating an AI to evaluate mortgage applications. Taking a machine learning approach, the bank may use its historical mortgage approval data to teach the algorithm what a creditworthy applicant looks like. However, those historical mortgages were approved by humans and may display a pattern of bias against people of color, single female applicants, blue-collar workers, or the young. By using this data to train the algorithm, the bank would teach it to avoid such applicants in the future.

This creates two risks. First, the bank may risk losing out on a large pool of potential customers. If, for example, many young people or people of color moved into the neighborhood, they would find their applications for mortgages rejected by the AI and

would use a different bank. Second, the bank may expose itself to the risk of complaints under anti-discrimination laws. If the government or consumers were able to show a systematic pattern of bias, the bank may face fines and other penalties.

A similar problem arises if, instead, the bank asks its mortgage team to work with programmers to create a set of rules for approving loans. In this case, the inherent biases of the programmers and employees would be baked into the algorithm.

What can firms do?

Protecting against the risks posed by AI bias must be a priority for firms planning to use algorithms in decisions and processes that affect customers and employees. However, mitigating bias is not a simple task. One crucial step is ensuring that development teams are diverse. Research has shown that more-diverse programming teams build fairer and less biased algorithms.

Another important step is to prioritize identifying potential bias during testing. Test simulations should be designed to identify patterns of bias so that steps can be taken to address issues – such as biased data or instructions – that are causing problems.
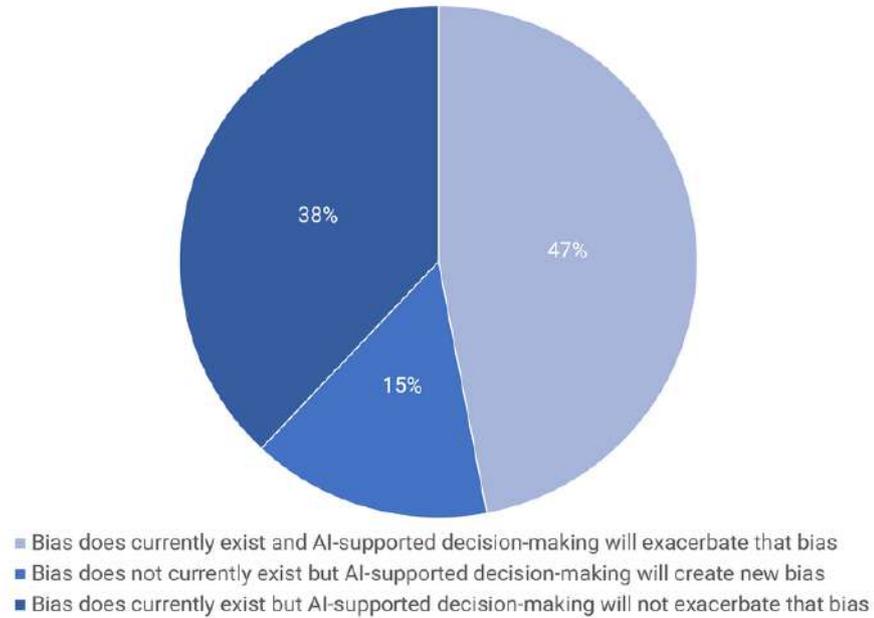

What Impact Will AI Have on Bias in Credit Decision-Making?

- 47%
- 38%
- 15%

- Bias does currently exist and AI-supported decision-making will exacerbate that bias
- Bias does not currently exist but AI-supported decision-making will create new bias
- Bias does currently exist but AI-supported decision-making will not exacerbate that bias

Finally, it is important to ensure that bias is not introduced after launch. Well-designed

Source: Transforming Paradigms: A Global AI in Financial Services Survey. World Economic Forum.

AIs engage in constant learning, refining themselves over time. This process may introduce biases that were not present during initial testing. Thus, ongoing monitoring is needed to ensure good outcomes.

AI has the potential to transform the financial system, reducing errors, lowering costs, improving accessibility, and benefiting consumers. However, the issue of bias means that some consumers are at risk of being harmed by the adoption of AI. To protect themselves and their customers, firms must ensure that bias considerations form a core part of their AI development processes.

Intuition Know-How has a number of tutorials that are relevant to AI and other topics discussed by the above article:

- Robotic Process Automation (RPA)
- Artificial Intelligence (AI)
- Data Analytics
- Risk – Primer

- Risk Management – An Introduction
- Credit Risk – An Introduction
- Credit Risk Customer Management – An Introduction