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July 1, 2021

Office of the Comptroller of the Currency
400 7th Street, SW., Suite 3E-218,
Washington, DC 20219
Via: Regulations.gov
Docket ID OCC-2020-0049

Consumer Financial Protection Bureau
1700 G Street, NW,
Washington, DC 20552
Via email: 2021-RFI-AI@cfpb.gov
Docket No. CFPB-2021-0004

Federal Reserve
20th Street and Constitution Avenue NW,
Washington, DC 20551
Via email: regs.comments@federalreserve.gov
Docket No. OP- 1743

National Credit Union Administration
1775 Duke Street,
Alexandria, VA. 22314-3428
Via: Regulations.gov
Docket No. NCUA-2021-0023

Federal Deposit Insurance Corporation
550 17th Street NW,
Washington, DC 20429
Via email: Comments@fdic.gov
RIN 3064-ZA24

Re: Request for Information and Comment on Financial Institutions' Use of Artificial Intelligence, including Machine Learning

Dear Officers,

On behalf of more than 500,000 members and supporters of Public Citizen across the country, we provide the following comments in response to the joint agency "Request for Information and Comment on Financial Institutions' Use of Artificial Intelligence, including Machine Learning."[1]

As the RFI explains, the agencies are gathering information and comments on financial institutions' use of artificial intelligence (AI), including the use of algorithms to track user data and other types of machine learning. The scope of the RFI includes financial institutions' use of AI in customer service, lending, operations, governance, risk management and any other bank activity. Through this RFI, agencies are

[1] Banking agencies, *Request for Information and Comment on Financial Institutions' Use of Artificial Intelligence, Including Machine Learning,* FEDERAL REGISTER, (March 31, 20210 https://www.govinfo.gov/content/pkg/FR-2021-03-31/pdf/2021-06607.pdf

specifically requesting comment on how AI affects the safety and soundness of banking and its bearing on how a bank complies with laws, particularly consumer protection statutes.

Public Citizen believes that transparency must be a central pillar to ensuring that AI promotes financial sector safety and compliance with consumer protection and other laws. We support adherence to the Universal Guidelines for Artificial Intelligence.[2] The first of these guidelines is a "right to transparency," in which "All individuals have the right to know the basis of an AI decision that concerns them. This includes access to the factors, the logic, and techniques that produced the outcome."[3]

Public Citizen emphasizes that transparency is the floor, and not the ceiling, for regulation of algorithms – especially as they impact Americans' livelihoods through decisions about credit, lending, and banking. Below, we detail our additional policy recommendations regarding AI use in financial institutions.

Artificial Intelligence: Background

While the agencies do not specifically define Artificial Intelligence, which is a broad term subject to interpretation and numerous subcategories, the tacit understanding in this request for comment is that it refers to the wide use of data and decision-making algorithms that are spontaneously updated based on results. More precisely, the agencies focus on machine learning.

An algorithm is a set of instructions that addresses a problem. Like a cookbook recipe, the algorithm lists steps in a particular order. Unlike a recipe, it can direct a different path depending incoming information. Machine learning is a division of AI where algorithms produce other algorithms. The "recipe" is constantly updated based on each new input of information. The machine "learns" over time, and ideally toward more accurate and fair results.

Currently, financial institutions deploy machine learning and other AI to combat money laundering (with the use of data understood to detect suspicious activity); credit decisions (including the use of alternative data that may better predict the chance of repayment); risk management (such as the myriad inputs that may affect the prospects for a complicated trading position); and cybersecurity (in the anticipation of malicious attacks).

Technology, of which AI is part, has long fueled advances in the basic engine of banking, which is information. As AI and technology become more complex, both the potential for progress and hazards also grows. AI has the potential to reduce human bias in banking, but in practice, often exacerbates it. Computers can marshal countless data points from around the web that go beyond the financial transactions that previously informed, say a credit score, and in turn, lending terms.[4] But this process is less transparent, less accessible, and more difficult to explain or understand—and thus, more difficult to

[2] The Public Voice, *Universal Guidelines for Artificial Intelligence*, THE PUBLIC VOICE (Oct. 23, 2018) https://thepublicvoice.org/ai-universal-guidelines/

[3] The Public Voice, *Universal Guidelines for Artificial Intelligence*, THE PUBLIC VOICE (Oct. 23, 2018) https://thepublicvoice.org/ai-universal-guidelines/

[4] Jason Scott Johnston, *The Freedom to Fail: Market Access as the Path to Overcoming Poverty and Inequality*, 40 HARV. J.L. & PUB. POL'Y. 41, 44 (2017); Jonelle Marte, *Here's How Much Your Credit Score Affects Your Mortgage Rate*, WASH. POST (Nov. 17, 2016), https://www.washingtonpost.com/news/getthere/wp/2016/11/17/heres-how-much-your-credit-score-affects-yourmortgagerate/?noredirect=on&utm_term=.dab31a344b39.

audit and regulate. This lack of transparency is the reason many call decision-making algorithms "black box" algorithms.[5]

Artificial Intelligence in Banking

Lending: The fundamental reason for banking is loan making. A bank gathers savings from depositors, and then lends this money to borrowers, such as through a business loan or a mortgage. Information is critical to loan-making decisions. The ability to repay turns on the income of a person or business, which also depends on other circumstances, such as market forces, including employment, changing appetites for a business' product or its competition. These simple circumstances are often subject to conjecture. AI can enhance these decisions by absorbing large amounts of data and detecting patterns that might anticipate changing circumstances. Information technology departments now figure prominently at most businesses.

Discrimination against certain classes, such as minorities or women has festered in the banking industry for decades. Multiple laws forbid such discrimination. AI, in its best use, could combat this problem. For example, a pharmaceutical industry consultant who is African American applied for a mortgage from a conventional lender and was rejected. She thought this might have been due to a number of factors including her race, gender, or perhaps her uneven consulting income or relatively low credit rating. She then discovered a digital lending platform online and secured the loan. This platform drew on a number of data points from the applicant.[6] This broader understanding of her creditworthiness, and arguably the absence of human bias, may have been the difference. One study found that online lenders using algorithms discriminated 40 percent less compared to face-to-face lenders in loan pricing. (While the researchers found less discrimination, the loan prices for Latinx and African American mortgage applicants were higher than the average for these online lenders. Forty percent less is not 100 percent less.)[7]

AI promises to widen access to credit where traditional credit rating-based information can frustrate loan-making. The Consumer Financial Protection Bureau (CFPB) estimates that 45 million Americans lack access to mainstream credit because they have insufficient, outdated, or no credit history. Traditional decision-making tools used to assess credit risk can be ineffective and disproportionately harm people of color.[8] Alternative data or modeling techniques "…could increase access to credit for that population by providing more information about them and enabling them to be reliably scored," according to the CFPB.

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[5] Jenna Burrell, *How the Machine 'Thinks': Understanding Opacity in Machine Learning Algorithms*, JANUARY-JUNE 2016 BIG DATA & SOCIETY 1, https://journals.sagepub.com/doi/pdf/10.1177/2053951715622512.; Elin Wihlborg, Hannu Larsson, Karin Hedström, *"The Computer Says No!" – A Case Study on Automated Decision-Making in Public Authorities*, 2016 INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS 2903, https://ieeexplore.ieee.org/document/7427547.

[6] Jennifer Miller, *Is an Algorithm Less Racist than a Loan Officer?* NEW YORK TIMES (Sept. 18, 2020) https://www.nytimes.com/2020/09/18/business/digital-mortgages.html

[7] Robert Bartlett et all, *Consumer-Lending Discrimination in the FinTech Era,* UNIVERSITY OF CALIFORNIA, BERKLEY (Nov. 2019) http://faculty.haas.berkeley.edu/morse/research/papers/discrim.pdf?_ga=2.161360829.1884437453.1583517590-1779220203.1578413279

[8] Lisa Rice & Deidre Swesnik, *Discriminatory Effects of Credit Scoring on Communities of Color*, 46 SUFFOLK U.L. REV. 935 (2013), https://cpb-us-e1.wpmucdn.com/sites.suffolk.edu/dist/3/1172/files/2014/01/Rice-Swesnik_Lead.pdf.

For example, some individuals may lack a history of paying an installment loan, but might be a stable payer of other bills, such as a mobile phone, from which AI could learn to glean.[9] But these methods have not yet proven effective in reducing bias and improving fairness. Nevertheless, one study found that both in-person and online lenders charge Latinx and African American borrowers 6 to 9 basis points in higher interest rates. (A basis point is 1 percent of 1 percent.)[10]

Algorithmic bias, however, poses a serious problem. For example, Amazon applied AI to help it review resumes for job applicates in an attempt to identify the most desirable candidates. It focused on education and skills and related these to recently hired employees.[11] But the algorithms began to discriminate against women because the earlier hires that populated the algorithm data were largely male. Proxies such as women's colleges or women-only clubs, or even the absence of "male" words such as "executed" or "captured" on the resume resulted in proportionally fewer women identified for interviews. Amazon reportedly scrapped the experiment. [12] [13] Amazon's retreat from this experiment may have resulted when it discovered an identifiable set of proxies. For banking, where the proxy is not identifiable for discrimination, regulators should consider banning the particular firm from using AI in credit decisions.

In financial services, Apple introduced its own credit card, called AppleCard in 2019. One couple found that while applying for the card, the man was offered a spending limit 20 times higher than that of the woman.[14] Notably, the couple submitted similar information from their shared tax returns; the woman actually reported a higher credit score. Goldman Sachs, the bank issuing the AppleCard, denied that the algorithm determining credit scores is biased. Instead, the bank defended itself with the claim that the algorithm had been audited by a third-party and did not use gender as a decision-making factor.[15] Goldman Sachs's defense, however, may reveal another problem with AI, namely that the absence of explicit gender-based decisions may mask less obvious proxies that result in the same discrimination.

The use of additional data can also embed discrimination, since bias pervades society and presumably the resulting data.

Ultimately, as with Apple, the results from AI-based lending should be measurable. Home Mortgage Disclosure Act (HMDA) data and other sources can test the results of AI lending. Even before discrimination emerges, though, regulators should inspect the AI algorithms to determine what data may be responsible for discrimination. For individuals, the Equal Credit Opportunity Act (ECOA), requires

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[9] *Data Point: Credit Invisibles*, CONSUMER FINANCIAL PROTECTION BUREAU (May 2015), available at http://files.consumerfinance.gov/f/ 201505_cfpb_data-point-credit-invisibles.pdf

[10] Robert Bartlett, Adair Morse, Richard Stanton, & Nancy Wallace, *Consumer-Lending Discrimination in the FinTech Era*, FEDERAL DEPOSIT INSURANCE CORPORATION (February 2019), https://www.fdic.gov/bank/analytical/fintech/papers/stanton-paper.pdf.

[11] See Jeffrey Dastin, *Amazon Scraps Secret AI Recruiting Tool That Showed Bias Against Women,* REUTERS (Oct. 9, 2018), https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G.

[12] Daniel Schwarcz and Anya Prince, *Proxy Discrimination In The Age Of Artificial Intelligence And Big Data,* IOWA L.REV.(Forthcoming 2020) Cited in: https://financialservices.house.gov/uploadedfiles/hhrg-117-ba15-wstate-johnsonk-20210415.pdf

[13] See Jeffrey Dastin, *Amazon Scraps Secret AI Recruiting Tool That Showed Bias Against Women,* REUTERS (Oct. 9, 2018), https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G.

[14] Alexandra Ossola, *The Real Hero of the Sexist AppleCard Saga Has Issued a Statement*, QUARTZ (November 11, 2019), https://qz.com/1746446/the-real-hero-of-the-sexist-applecard-saga-has-issued-a-statement/.

[15] Will Knight, *The Apple Card Didn't 'See' Gender – And That's The Problem*, WIRED (November 19, 2019), https://www.wired.com/story/the-apple-card-didnt-see-genderand-thats-the-problem/.

creditors to notify an applicant of the principal reasons for taking adverse action for credit or to provide an applicant a disclosure of the right to request those reasons. Ideally, this can guard against credit proxies that lead to discrimination. Where some proxies may not be obvious, banking agencies should subject financial institutions' AI to rigorous study.

One technique to address this may be "adversarial debiasing." As explained by one AI expert, "It pits two machine learning models against each other: the first model predicts creditworthiness and the second one tries to predict the race, gender, or other potentially-protected class attributes of the applicant scored by the first model. Competition in this game drives both models to improve their methods until the predictor can no longer distinguish the race or gender outputs of the first model, resulting in a final model that is accurate *and* fair."[16]

AI's promise can also be its hazard, namely, that the algorithms aren't stagnate. The decision tree that led to a rejection for one applicant may be different than a rejection for another because of machine learning. This may be an intractable problem. We welcome the agencies' acknowledgement of this problem in their discussion of "dynamic updating." As noted, "Dynamic updating techniques can produce changes that range from minor adjustments to existing elements of a model to the introduction of entirely new elements."[17]

Bank trading: Beyond interactions with individual customers, AI plays a prominent role in risk management and trading. With trillions of dollars in assets, the size of the nation's largest banks presents an enormous vulnerability to the economy should they fail to manage risk well. The 2008 financial crash followed massive fraud in what should have been tightly managed risk assessment for mortgage-making and securitization. Actions brought by the Department of Justice revealed willful disregard for common quality control measures, such as ensuring borrowers' ability to repay on a flood of new mortgages.[18] AI and better technological oversight may not have provided a solution to a future similar situation given the overriding frauds at issue in the 2008 crash. But such AI oversight, when reviewed by alert federal agencies could perhaps help to prevent the next crash.

The Dodd-Frank Wall Street Reform and Consumer Protection Act restricted banks from engaging in proprietary trading under Section 619, colloquially known as the Volcker Rule. The rule still permits market making. It also permits banking institutions to partner with hedge funds and other investment firms through prime brokerage, which offers loans and low-cost trading services. Even prime brokerage can be risky, as evidenced by the recent implosion of Archegos Capital Management. Archegos secured billions of dollars in loans from a series of banks then made investments that proved fatal. That left a number of major banks with billions in losses.[19] Whatever machine learning these banks deployed to monitor their credit risk failed.

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[16] Kareem Salah, *There's A Fix To The Problem Of Biased Algorithms in Lending,* LINKEDIN (Dec. 10, 2019) https://www.linkedin.com/pulse/theres-fix-problem-biased-algorithms-lending-kareem-saleh

[17] Banking agencies, *Request for Information and Comment on Financial Institutions' Use of Artificial Intelligence, Including Machine Learning,* FEDERAL REGISTER, (March 31, 20210 https://www.govinfo.gov/content/pkg/FR-2021-03-31/pdf/2021-06607.pdf

[18] Bartlett Naylor, TOO Big, Public Citizen (2016) https://www.citizen.org/wp-content/uploads/toobig.pdf

[19] Margot Patrick, *Archegos Losses Top $10 Billion as UBS, Nomura Add to Damage*, (April 27, 2021) https://www.wsj.com/articles/ubs-takes-surprise-774-million-archegos-hit-11619501547?mod=hp_lead_pos1

AI computers may have also been missing from the London Whale episode at JP Morgan, where the bank lost billions from trading.[20]

Nevertheless, bank trading generally relies on computers. One firm reported that where it employed 600 human traders in its equities trading division, it now employs two human traders supplemented by 200 computer engineers.[21] For regulators, understanding the integrity of these massive trading computer models is an enormous responsibility. Public Citizen calls for public transparency in Volcker Rule compliance. Publishing trading positions and results after a period of time (such as a quarter or year) can help marshal academic and other oversight.[22] While this does not mean the public can look into the computer models themselves, it can help detect where certain trading strategies pose risk.

Some regulators are exploring the use of AI to monitor suspicious market activity. For example, the Commodity Futures Trading Commission (CFTC) argues that AI can help detect spoofing, where a manipulator places a larger buy order, then, when the price rises owing to this order, sells high, then cancels the original buy order. This entire episode can take place in five seconds. The CFTC says that "An AI system can train on market data and then develop a model to detect potentially illicit activity." [23]

High frequency trading: Automated trading run by machine learning algorithms in what's known as high frequency trading accounts for around half of stock trades.[24] As Public Citizen has found, high-frequency trading may pose a risk to ordinary investors because the phenomenon of computers acting on other computers' signals could trigger a runaway chain reaction, causing a stock market meltdown. High-frequency traders have been blamed in part for the 2010 "flash crash," in which the Dow Jones Industrial Average lost about 10 percent of its value in 10 minutes for no clear reason.[25] These strategies may be unfair, as high-frequency traders enjoy advantages that enable them to receive information and complete orders a split-second sooner than others. This allows them to profit at the expense of other traders.[26]

Public Citizen joins a large, diverse coalition of allies in promoting a financial transaction tax that would reduce the incentive of these sorts of trades. Short of that, regulators should examine the machine learning

[20] David Smith, *Did and Excel Error Bring Down the London Whale*, REVOLUTIONS (Feb. 11, 2013) https://blog.revolutionanalytics.com/2013/02/did-an-excel-error-bring-down-the-london-whale.html
[21] Raghav Bharadwaj, *Artificial Intelligence at Investment Banks,* EMERJ (Oct. 4, 2019) https://emerj.com/ai-sector-overviews/artificial-intelligence-at-investment-banks-5-current-applications/
[22] Traders who leave one company for another are given "gardening leave," a euphemism for a time where they work for neither company. It can be as little as a month. This means that the proprietary information that an outgoing employee knows is stale after that time.
[23] A Primer on Artificial Intelligence in Financial Markets, Commodity Futures Trading Commission, (website visited May 4, 2021) https://www.cftc.gov/LabCFTC/Primers/index.htm
[24] Gregory Meyer, Nicole Bullock and Joe Rennison, *How High-Frequency Trading Hit a Speed Bump*, Financial Times (Jan. 1, 2018), https://on.ft.com/2MVw89U.
[25] Andrei Kirilenko, Albert S. Kyle, Mehrdad Samadi, Tugkan Tuzun, *The Flash Crash: High-Frequency Trading in an Electronic Market*, Journal of Finance (forthcoming) (last revised March 10, 2018), http://bit.ly/2IqmXdm
[26] Taylor Lincoln, *A Progressive Tax with Beneficial Effects,* PUBLIC CITIZEN, (Sept. 16, 2019) https://www.citizen.org/article/financial-transactions-tax-report/#_ftn7

trading algorithms themselves. To date, regulation has focused mainly on steps to prevent another flash crash including herding behavior.[27] But regulators should be able to inspect the computer models as well.

Robo advisors: Robo-advisers are a type of financial adviser that provide investment advice with minimal or even no human intervention. These are automated, algorithmically driven services that help identify arguably sound investment opportunities for individuals. Robo-advisers can reduce costs, reduce conflicts of interest, and advantage a broader range of information than a human advisor.[28] But robo-advisors could be programed to promote certain products that generate a higher commission for the platform sponsor, a problem endemic in the investment sector. Again, transparency overseen by regulators is key to preventing abuse by this type of AI.

Regulating Artificial Intelligence

Better understand harms and causes.

Transparency. As noted throughout this comment, the foundational policy required to promote the advantages of AI while guarding against problems such as discrimination, conflicts of interest, inadequate risk management and other problem areas within the financial services will be transparency. Public Citizen supports the Universal Guidelines for Artificial Intelligence, which should be codified into law.[29] The Guidelines are intended to maximize the benefits of AI, minimize the risk, and ensure the protection of human rights. As the guidelines explain, "Modern data analysis produces significant outcomes that have real life consequences for people in employment, housing, credit, commerce, and criminal sentencing. Many of these techniques are entirely opaque, leaving individuals unaware whether the decisions were accurate, fair, or even about them." Transparency must be the founding principle. That will allow independent accountability for automated decisions so that an individual can understand the basis for an adverse determination.

Explainability. In addition to these principles, AI must be "explainable." It is one thing for an algorithm to be presented, and another for it to be understood. This is especially problematic for average citizens who may not be conversant with complex decision trees that underpin AI. Regulators should consider issuing standards of explainability for financial institutions using AI. For example, we might require explanations to conform to a consistent template of terms and organization, not unlike U.S. Securities and Exchange Commission (SEC) filings, which exemplify consistent templates.

FTC 6(b) studies. The Federal Trade Commission can and should commission studies through its authority in section 6(b) of the Federal Trade Commission Act to further explore

[27] Joseph Lee, *Access to Finance for Artificial Intelligence Regulation in the Financial Services Industry,* EUROPEAN BUSINESS ORGANIZATION LAW REVIEW, (Nov. 18, 2020) https://link.springer.com/content/pdf/10.1007/s40804-020-00200-0.pdf

[28] Joseph Lee, *Access to Finance for Artificial Intelligence Regulation in the Financial Services Industry,* EUROPEAN BUSINESS ORGANIZATION LAW REVIEW, (Nov. 18, 2020) https://link.springer.com/content/pdf/10.1007/s40804-020-00200-0.pdf

[29] The Public Voice, *Universal Guidelines for Artificial Intelligence*, THE PUBLIC VOICE (Oct. 23, 2018) https://thepublicvoice.org/ai-universal-guidelines/

discriminatory commercial practices underlying algorithms in lending, bank trading, high frequency trading, and robo advisors. Findings of these studies related to the relevant commercial firms, makeup and use of algorithms, development process for algorithms, scale of impact on consumers and markets, and harms on communities of color in particular, should help inform future government regulation.

Create new rules for the road.

Impact assessments. Public Citizen also recommends that regulators issue guidance to financial institutions to complete algorithmic impact assessments (AIAs). AI Now, a research institute examining the social implications of AI, has published a framework the government could follow:

- *"Agencies should conduct a self-assessment of existing and proposed automated decision systems, evaluating potential impacts on fairness, justice, bias, or other concerns across affected communities.*
- *Agencies should develop meaningful external researcher review processes to discover, measure, or track impacts over time.*
- *Agencies should provide notice to the public disclosing their definition of "automated decision system," existing and proposed systems, and any related self-assessments and researcher review processes before the system has been acquired.*
- *Agencies should solicit public comments to clarify concerns and answer outstanding questions; and*
- *Governments should provide enhanced due process mechanisms for affected individuals or communities to challenge inadequate assessments or unfair, biased, or otherwise harmful system uses that agencies have failed to mitigate or correct."*[30]

Update existing law. James Allen in the Fordham Law Review suggests updating existing law and regulation created to prevent analogue methods of discrimination, so that they extend to modern methods of both unintended and intended discrimination.[31] For example:

- The CRA could be updated to apply beyond banks and their locale. Rather, Allen proposes amendments to the act to apply to all online lending institutions, and not just geographic locale.
- The ECOA could be amended to include a provision that requires lenders to disclose the exact metrics or data points they use to generate scores or interest rates.
- Credit card companies, credit reporting bureaus, and mortgage lenders should be required to disclose the data inputs they use to formulate credit scores and mortgage rates.

Antidiscrimination disparate impact claims. While AI has the potential to improve financial products and services, regulators must combat against unintended consequences that lead to discrimination in credit, lending, and banking against low-income communities and people of color, who have historically been discriminated against in financial services. The agencies should

[30] Dillion Reisman, Jason Schultz, Kate Crawford & Meredith Whittaker, *Algorithmic Impact Assessments: A Practical Framework for Public Agency Accountability*, AI NOW INSTITUTE (April 2018), https://ainowinstitute.org/aiareport2018.pdf.
[96] Allen, *supra* note **Error! Bookmark not defined.**.

consider working with Congress to ensure that individuals who are discriminated against as a result of unintentional discriminatory AI actions can challenge those actions in court through disparate impact claims.

With all its possible benefits, AI contains potential for abuse and to exacerbate societal ills such as discrimination. Government regulators need increased authority to ensure maximum transparency and other elements critical to oversight to make these complex decision making trees accountable to the public. We thank you for taking comment on this critical topic and Public Citizen and our allies look forward to working with you to craft safeguards to end the use of black box algorithms in financial services. For questions, please contact Bartlett Naylor at bnaylor@citizen.org, or Jane Chung at jchung@citizen.org.

Sincerely,

Public Citizen