Statement by

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of the

Committee on Financial Services

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Chairman Foster and Ranking Member Loudermilk, thank you for inviting me to testify about "Robots on Wall Street: The Impact of AI on Capital Markets and Jobs in the Financial Services Industry." My remarks provide background on the role and implications of automation and algorithmic systems on the financial services workforce, and I offer an opinion on how we might mitigate the negative impacts of such systems, in particular for those underrepresented in the financial services sector.

My name is Dr. Charlton McIlwain. I currently serve as a Vice Provost at New York University. I am a tenured Full Professor in the Department of Media, Culture, and Communication at New York University, where I have been a faculty member for nineteen years. I offer testimony today in my capacity as a professor and researcher, and my testimony today in no way represents the view or position of the institution I serve.

I started my academic career almost twenty years ago researching how racial discrimination is produced, and how it impacts our electoral politics, specifically how racial dynamics in our electoral system often undermine our country's principles of representation, equality, and equal opportunity. My expertise in this area has afforded me the opportunity to serve as an expert witness in two federal court cases. These cases have some bearing on my remarks today. Each of those cases focused on how financial service providers – mortgage lenders more specifically – targeted Black and Latinx homebuyers as a market for predatory mortgage products.[1]

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[1] I worked with Relman, Dane & Colfax, PLLC and South Brooklyn Legal Services, in the case of Saint-Jean v. Emigrant, United States District Court for the Eastern District of New York, case# 1:11-cv-02122 (involving racial targeting and housing discrimination); and for South Brooklyn Legal Services in the case of Barkley, et al. v. United Homes, et al., United States District Court for the Eastern District of New York, case #s 04-CV-875 (KAM), 05-CV-187 (KAM), 05-CV-4386 (KAM), 05-CV-5302 (KAM), 05-CV-5362 (KAM), 05-CV-5679 (KAM) (involving racial targeting and housing discrimination).

For the past ten years I have devoted my efforts to researching and illuminating the ways that Internet platforms and automated and algorithmic systems impact these same racial dynamics. I research how such systems may discriminate against, and disparately impact, individuals and communities of color. For instance, I have published work such as *Racial Formation, Inequality and the Political Economy of Web Traffic.* I am also a historian of technology, exemplified most recently in my new book *Black Software*[2] which, among other features, highlights the devastating outcomes resulting from automation, beginning in the 1960s, African Americans' persistent underrepresentation in the technology workforce, as well as highlighting the ways that African Americans have used computing technology and the Internet to advance their own economic, social and political interests. In 2017, I founded the Center for Critical Race & Digital Studies, a research center and network of experts who seek to better understand the ways that new technologies impact and are impacted by communities of color.

Key Questions

I have been asked to supply information about and insight into: (1) the types of automation currently being deployed in capital markets and the financial sector, and how that affects decision-making; (2) how AI and automation can help and hurt workers by disruption of the current and future financial services workforce; (3) what "regtech" is and how AI can be deployed to help regulators better supervise financial institutions; and (4) ways to deter algorithmic bias. I will do my best to address these points from my expertise as a historian of technology, a social scientist studying algorithmic systems and decision making, and my focus on the implications of these technologies on marginalized communities, particularly communities of color.

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[2] Charlton D. McIlwain (2019) *Black Software: The Internet & Racial Justice, From the Afronet to Black Lives Matter*, New York: Oxford University Press.

Financial Sector Automation

I use the term "automation" to refer to the application of computing technology (generally software-based) to control the execution of business processes, transactions and consumer services, with little human intervention. Automation is certainly not new in concept or application and is utilized across a wide range of industries and sectors of our economy. This means that the opportunities, anxieties, complications and implications of automation are also not new and provide evidence from the past that can provide us insight into what we should be concerned about now and in the future with regard to how increased automation will affect new sectors such as the financial services industry. I use the term "artificial intelligence" at its most basic level, to refer to software that: utilizes human-designed algorithms to rapidly process and analyze large volumes of data, utilizes data analytics to predict outcomes, then utilizes those predictions to inform and/or determine decisions. Automation and artificial intelligence might be separate or paired products and processes.

For example, a bank may automate the home loan application process by developing an app (a term I will use to distinguish the technology from the process of applying for something) that allows me to utilize my smartphone to supply the necessary information. The app may be designed to connect to and draw information from other databases and use the information I supply as an applicant (such as my social security number, address, etc.) to automatically verify my identity, and pull into my mortgage application additional information such as my credit bureau scores and/or reports. The automation aspect of this application, which arguably makes application submission and processing more efficient for both the bank and me, the individual applicant, could end there. At that point the information gathered could be turned over to a human loan officer to further process and make a loan decision.

Additionally, however, the bank may utilize a software application that uses key variables supplied/generated from the app (for example my credit score, annual income, and the amount of other debt) to compare to a larger database of loan applicants. That data would be analyzed to predict whether I am at low enough risk for defaulting on my loan, in which case I would be approved for a mortgage. If I posed high enough risk, my application would be rejected. This would be done by constructing an algorithm that predetermines what data variables will be utilized to model varying levels of risk (credit score, annual income, and amount of other debt), and how each of these variables will be weighted (e.g., credit score might be weighted highest, followed by income, followed by debt). Further, even if I meet a minimum risk threshold, a separate algorithm might be utilized to determine pricing, that is, how much I will pay in interest on the loan. This algorithm might automatically and positively correlate my risk score with the loan price (such that the higher my acceptable risk, the higher the loan price), based on a different algorithm that seeks to maximize potential profits for the bank. The end result of this automated, algorithmic product is a decision to reject my loan application or approve my application at a particular price point.

The example above (credit risk scoring) is but one of many that fall under the now colloquial category called "fintech." These are automated and algorithmic applications that seek to maximize consumer access to, interaction with, and benefits from the financial sector. A sample of additional examples include:

1. Fraud Prevention apps that, for example, a bank might use to algorithmically profile a consumer based on their past purchasing patterns, then alert the bank and the consumer about deviations from that pattern, prompting the consumer to verify whether they made and/or authorized a specific transaction;

2. High Frequency Trading apps that use algorithms to analyze market information and execute trades at high speeds to maximize potential profits or gain other advantages in the market;

3. Personalized Banking apps that automate routine consumer banking transactions such as paying bills or sending automated reminders that bill payments are due/overdue, or that provide personal finance apps that use algorithms to help a user track or forecast spending, etc.

Impact of Automation on Financial Sector Workers

The actual and perceived impact of computer driven automation has been a key labor and civil rights concern since its rise to prominence in the late 1950s and early 1960s. Two principles, advanced by labor and civil rights leaders from that time period – individuals who were no stranger to this legislative body – continue to be relevant to this day as a guide and framework for understanding how automation might impact workers in general, and have a disparate impact on African American and other racially and socioeconomically marginalized citizens in our society. Labor leader A. Philip Randolph suggested that automation should be guided by principles of inclusion, one that mitigates against the disparate positive and negative impacts of technology. This, he asserted, would be possible by making sure that we prepared the workforce for new jobs that could be produced by automation. He said,

> The great masses of the people should not be required to bear the brunt of the impact of this great automation revolution which is shaking the world. But what can be done about it? You cannot destroy the machine, you cannot stifle the invention of various geniuses in the world. Then what is to be done? We must reduce the hours of work, we must shorten the workday, the workweek, the workmonth, in order to make new jobs. For instance, in

our own field, if the Brotherhood of Sleeping Car Porters can win the fight for the forty-

hour week we will make one thousand new jobs.

Ahead of what later became President John F. Kennedy's Manpower and Development Training

Act of 1962, and motivated by early concerns about automation, Congressman Adam Clayton

Powell, Jr. framed how the outcomes from automation would be influenced by the more

overarching presence of racial discrimination. He said:

> I shall not quote statistics. To do so would be a waste of your time and that of my staff.
> We know that the Afro-American is the last-hired, first-fired. We know that he pays a tax
> on being black, which makes him the lowest wage earner in this Nation. We know that he
> is quarantined, regardless of ability and education, so that his highest achievement can be
> the attainment of only creature comforts. We know that he composes the largest number
> of unemployed in this Nation today. We know that the new era of automation does not
> include him. We know that Government—local, State and Federal—rigidly excludes him
> or gives him token consideration at high levels and mass menial jobs at low levels.[3]

As we reflect on our current moment and the future of automation in the financial services

sector, Randolph and Powell's principles give us ample reason to remain concerned. Why?

First, the financial services sector is ripe for automation and algorithm-driven innovation. A

2017 McKinsey Global Institute study estimated that fifty percent and upwards of key

financial/insurance service sector tasks (specifically those involving data/document collection

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[3] Charlton D. McIlwain (2019), *Black Software: The Internet & Racial Justice, from the Afronet to Black Lives Matter*.

and processing) are at risk of being automated.[4] Mckinsey also forecasted that "machines will do up to 10 to 25 percent of work across bank functions."[5]

Second, the fintech sector is on the rise. Both companies and consumers recognize its efficiencies and conveniences. For example, Ernst & Young's annual survey of fintech adoption, has shown a 16% to 64% increase in fintech adoption among consumers and small and medium size enterprises, between 2015 and 2019.[6]

Third, large numbers of workers will likely be displaced in the financial services sector (as well as others), even if automation and AI development is projected to create new types of jobs. As two Brookings Institution researchers put it, "Robots kill jobs. But they create jobs, too".[7] If the financial services sector is ripe for automation, if increased adoption and development of fintech increases the propensity for automation, and if automation is likely to displace significant numbers of workers, then the cause for concern is clear. It lies with the fact that African Americans and Latinx workers in particular, are already vastly underrepresented in the financial service sector workforce. Government Accountability Office analysis of Equal Employment Opportunity Commission (EEOC) data showed that African Americans, "Hispanics," and Asians make up only 22% of the financial service industry workforce. African American representation in the financial services sector (both entry and senior level jobs)

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[4] https://www.ncci.com/Articles/Pages/II_Insights_QEB_Impact-Automation-Employment-Q2-2017-Part1.aspx

[5] https://www.mckinsey.com/industries/financial-services/our-insights/the-transformative-power-of-automation-in-banking

[6] https://www.ey.com/en_us/financial-services/eight-ways-fintech-adoption-remains-on-the-rise

[7] https://www.brookings.edu/blog/up-front/2019/03/18/robots-kill-jobs-but-they-create-jobs-too/

declined from 2007 to 2015.[8] Less than 3.5% of all financial planners in the U.S. are Black or Latinx.[9] According to the EEOC, African Americans make up just 4.4% and Hispanics just 2.9% of the securities subsector, and Asians make up just 2.8% of the central banking and insurance subsectors. Further, the EEOC concluded each subsector in the financial industry has a large portion of establishments where the chances of moving into management are "unfavorable to women, African Americans, Hispanics and Asians when compared to white males. Entry into management may be a particular concern for Asians."[10]

My point is simple. Racial groups that are already extremely underrepresented in the financial services industry will be most at risk in terms of automation and the escalation of fintech development. This is especially true given the vast underrepresentation of African Americans and Latinx in the adjacent technology sector workforce. There, African Americans and Hispanics represent only 4% and 7% respectively of all workers, 2% and 5% respectively of managers, and 1% and 3% respectively of executives.[11] Further, automation's displacement patterns are likely to mirror the same disparities found during other forms of economic and workforce downturns. For instance, "Even though the poverty gap between blacks and whites has narrowed, a Pew study released last year found that blacks were still at least twice as likely as whites to live in poverty or be unemployed.[12]

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[8] Highlights of GAO-18-64. 2017. Financial Services Industry. Trends in Management Representation of Minorities and Women and Diversity Practices, 2007-2015.

[9] https://centerforfinancialplanning.org/wp-content/uploads/2018/10/Racial-Diversity-in-Financial-Planning.pdf

[10] https://www.eeoc.gov/eeoc/statistics/reports/finance/index.html

[11] https://github.com/cirlabs/Silicon-Valley-Diversity-Data

[12] https://www.cnn.com/2017/05/05/opinions/empathy-gap-in-viewing-black-poverty-and-pain-tanzina-vega/index.html

I close this section with another statement by one of our civil rights forbears, Bayard Rustin, who had one of the most sophisticated understandings at the time of computerized automation and its workforce implications. In his essay, *Automation and the Negro,* Rustin emphasized that the only hope we have to curb the devastating effects of automation on the black workforce is to plan deliberately for the inevitability of job displacement brought on by automation. If we are to mitigate the likelihood that automation will disproportionately and negatively affect those already underrepresented in the financial services industry, we must plan ahead, long into the future, rather than allowing the market to run its course toward predictable outcomes. Such planning requires developing an agenda that focuses on better understanding the potential effects of automation on the workforce. But it also means developing an agenda for how the public and private sector, higher education institutions and others will set and implement specific goals for educating and retraining the existing workforce. It also means committing to develop and fully utilize those who come through a more robust pipeline of underrepresented workers into the financial and technology sectors. The stagnant representation of people of color in both the financial services and technology sectors demonstrates our need to do something above and beyond the status quo.

"Regtech"

Regtech products help monitor regulatory and compliance processes within the financial and other industries. A recent report by Deloitte[13] identified 347 regtech companies worldwide actively developing such solutions across five regulatory areas including: regulatory reporting, risk management, identity management, compliance, and transaction monitoring.

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[13] https://www2.deloitte.com/lu/en/pages/technology/articles/regtech-companies-compliance.html

The most important characteristic of regtech is that they are a combination of automated and algorithmically-driven systems. As such, they provide the potential to improve the financial industry regulatory landscape. But they are, by no means, a panacea. Whether automated and algorithmically driven technologies are developed to serve consumers, produce financial profits for businesses, help industry comply with regulatory mandates, or help government regulate the financial sector, they are susceptible to biases that may produce tangible harms on citizens, and potentially disparate harms on certain groups.

Such biases generally become part of algorithmic systems by relying on data that is inaccurate, unrepresentative, or sourced from unreliable datasets. It also comes from algorithms that draw incorrect inferences from data, especially when that data is aggregated from multiple, disparate datasets and sources. Biases potentially become part of such systems when the variables and weighting of variables is not transparent, obscuring how algorithms draw connections between variables and draw inferences from large bodies of data to drive decisions. This problem is further exacerbated when we cannot trace (audit) the ways that an algorithm processes data that leads to apparent disparate outcomes, or when there is no "human in the loop" to monitor and scrutinize the outputs of algorithmic systems, at the very least to verify whether or not it actually accomplishes what it was designed to produce.

The Michigan Integrated Data Automated System (MiDAS) is one of the most recent and high-profile examples of how an algorithmic system utilized by a government agency, can produce tangible harms. In this case, the likely reliance on inaccurate and corrupt data to help detect unemployment fraud misidentified, accused, and commenced punitive financial actions against more than 34,000 Michigan residents. In this case, the algorithm that powered MiDAS misidentified potential fraud 85% of the time, resulting in devastating financial outcomes for

those falsely accused by the algorithmic system Further, the system allowed for no human review or verification before it commenced punitive actions against those accused.[14]

Deterring Algorithmic Bias

I want to conclude my remarks by briefly addressing the very important question about what we can do to deter algorithmic bias. Certainly, one course of action is to develop best practices for constructing and deploying algorithmic systems and providing more oversight from industry, government, and non-governmental bodies who are able to assess how such systems are used and the outcomes they produce. As cited above, this includes "technical" solutions that make algorithms more transparent and auditable to mitigate against potential biases *before* such systems gain widespread use, rather than trying to simply correct their effects once their damage is done.

But I want to emphasize that, especially when it comes to mitigating the potential disparate outcomes that biased algorithms might have on individuals and communities of color, simple reliance on "technical" fixes by technologists is not a complete solution. I argue that algorithmic bias, algorithmic discrimination, is not merely a financial issue. It is a civil rights issue. I want to end by again drawing on the wisdom of Bayard Rustin, who said of his time,

> Today the unskilled and semiskilled worker is the victim, but cybernation [an early term used in part to refer to algorithmic processes] invades the strongholds of the American middle class as once-proud white-collar workers begin sinking into the alienated world of the American underclass. And as the new poor meets the old poor, we find out that automation is a curse. But it is not the only curse. The chief problem is not automation, but social injustice itself.

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[14]https://spectrum.ieee.org/riskfactor/computing/software/michigans-midas-unemployment-system-algorithm-alchemy-that-created-lead-not-gold

Rustin's point, as applied to our current situation, is this. While we must do all that we can to make algorithmic systems fairer, more accurate, and more transparent, we cannot expect that such actions will remedy a central problem, which is social and racial injustice and discrimination. Take, as a final example, the findings from a recent National Bureau of Economic Research study titled, "Consumer-Lending Discrimination in the FinTech Era." There researchers sought to determine whether an algorithmic system could reduce discrimination in mortgage lending as compared to traditional face-to-face lending processes. Their findings were mixed. Yes, the algorithmic system discriminated 40% less than the traditional process. But that also meant that the process still discriminated against a large number of Black and Latinx loan applicants. Further, even though the algorithmic system did not, on balance, discriminate in terms of loan approval, it did discriminate against Black and Latinx users in terms of what they had to pay for their loans. One of the key conclusions of the study states that

> Both FinTechs and face-to-face lenders may discriminate in mortgage issuance through pricing strategies. We are just scratching the surface in the role of pricing strategy discrimination in the algorithmic area of data use. In short, algorithmic lending may reduce discrimination relative to face to face lenders, but algorithmic lending is not alone sufficient to eliminate discrimination in loan pricing.[15]

Even with the aid of a fair, accurate, and transparent algorithmic system, racial discrimination persists, the result of what can only be ascribed to systemic and structural racial discrimination that has plagued this sector throughout our history.

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[15] Bartlett, R., Morse, A., Stanton, R., & Wallace, N. (2019). *Consumer-lending discrimination in the FinTech era* (No. w25943). National Bureau of Economic Research.

What does this mean for us? It means that beyond our technical fixes, we must urge technologists and all of those who have a hand in developing and regulating algorithmic systems not to take a race-blind approach to solving the problems of algorithmic bias and discrimination. It means we must, as a general rule, demand that technologists, researchers, regulators, and others who have a stake in these systems specifically understand and determine how such systems will impact citizens based on racial group demographics. Finally, we must continue to do what we can to curb the underlying problem of racism. Such an approach must be ongoing, systemic and institutionalized.

Thank you again for allowing me the opportunity to contribute to these proceedings.