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Inclusive Capitalism Based on Binary Economics and Positive International Human Rights in the Age of Artificial Intelligence

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INCLUSIVE CAPITALISM BASED ON BINARY ECONOMICS AND POSITIVE INTERNATIONAL HUMAN RIGHTS IN THE AGE OF ARTIFICIAL INTELLIGENCE

INTRODUCTION

"Law is the invisible infrastructure that channels and facilitates economic activity. . . . In contemporary capitalism, property rights work to concentrate private wealth, when they could more profitably work to create and distribute much greater private wealth much more broadly without any redistribution or inflation."[1]

The global economy of the twenty-first century is marked by wealth disparity,[2] a declining labor share of total earnings,[3] and the emergence of technological innovations with the potential to disrupt the continuing reliability of labor income.[4] These trends have provoked new and

I am indebted to Professor Robert Ashford, the Bond, Schoeneck & King Distinguished Professor of Law at Syracuse University College of Law, for his generous commitment of time and energy in providing in-depth critiques, comments, interviews, and guidance in the final stages of drafting and researching this Note. Professor Ashford has asked me to note that his preferred term for "binary economics" is "inclusive capitalism based on binary economics." I am also very grateful for the incisive reviews and recommendations from Professors John N. Drobak, George Alexander Madill Professor of Real Property & Equity Jurisprudence; Professor of Economics; and Brian Z. Tamanaha, John S. Lehmann University Professor; both of Washington University School of Law. All mistakes are my own.

1. Martin Walls, *Professor Robert Ashford's 'Inclusive Capitalism' Gains International Support*, SYRACUSE U. NEWS BUS. & ECON. (Sept. 27, 2017), https://news.syr.edu/2017/09/professor-robert-ashfords-inclusive-capitalism-gains-international-support/ (quoting Professor Ashford) (emphasis added).

2. Alvaredo, et al., *infra* note 181. "Between 2007 and 2011, one-fourth of American families lost at least 75 percent of their wealth, and more than half of all families lost at least 25 percent of their wealth. . . . [T]hese large relative losses were disproportionally concentrated among lower-income, less educated, and minority households." Fabian T. Pfeffer, Sheldon Danziger & Robert F. Schoeni, *Wealth Disparities Before and After the Great Recession*, 650 ANNALS AM. ACAD. POL. & SOC. SCI. 98, 98 (2013).

3. "Since the 1970s, growth in inflation-adjusted, or real, hourly compensation has lagged behind labor productivity growth." Susan Fleck, John Glaser & Shawn Sprague, *The Compensation-Productivity Gap: A Visual Essay*, MONTHLY LAB. REV. 57, 57 (2011). *See* Roc Armenter, *A Bit of a Miracle No More: The Decline of the Labor Share*, FED. RES. BANK OF PHILA. RES. DEPT., 2015, at 1.

4. *See generally infra* Section I; *see also The Dawn of Artificial Intelligence: Hearing Before the Subcomm. on Space, Science, and Competitiveness*, 114th Cong. 14 (2016) (statement of Eric Horvitz, Technical Fellow and Director, Microsoft Research—Redmond Lab, Microsoft Corp.):

> [Artificial intelligence] systems will likely have significant influences on jobs and the economy. Few dispute the assertion that AI advances will increase production efficiencies and create new wealth . . . add[ing] [an estimated] 2.2 trillion U.S. dollars to the U.S. GDP by 2025. There are rising questions about how the fruits of AI productivity will [sic] distributed and on the influence of AI on jobs. Increases in the competencies of AI systems in both the cognitive and

compelling inquiries into the institutions and ideals driving the distribution of wealth.[5] Observers are left wondering whether the evolution or survival of these institutions might generate or require an economic order capable of enshrining not only the protection of individual property rights, but also the capitalist imperative to broaden the distribution of capital acquisition.[6]

An approach to a more inclusive capitalism based on the theory of binary economics has special relevance to this discussion.[7] It reveals market opportunities for low- and moderate-income people to acquire productive capital with the earnings of capital[8] by employing the same market

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> physical realms will have influences on the distribution, availability, attraction, and salaries associated with different jobs. We need to focus attention on reflection, planning, and monitoring to address the potential disruptive influences of AI on jobs in the U.S.—and to work to understand the broad implications of new forms of automation provided by AI for domestic and international economics.

Id. at 4 (statement of Sen. Gary Peters):

> [W]hile we must strive to optimize the full economic potential of AI, we must also address its potential impacts on the workforce. While new jobs will be created because of AI, we also have to think critically about the steps we can take today and in coming years to make sure that American workers are not left behind.

5. *See, e.g.,* Reich, *infra* note 13; Freeman, *infra* note 58; Estlund, *infra* note 226. For instance, scholars like Professor Robert Ashford wonder why protestors merely *occupied* Wall Street in 2011-12 when they should have advanced wealth-enhancing strategies based on binary economics to *own* it. (Viewed from another angle, an understanding of binary economics, according to Professor Ashford, reveals how Wall Street could derive profitable ownership-broadening opportunities from private initiatives aimed at long-term stimulation of consumer demand. *See infra* Section II.) *See generally* JEFF GATES, THE OWNERSHIP SOLUTION: TOWARD A SHARED CAPITALISM FOR THE TWENTY-FIRST CENTURY (1998); *see also* Robert Ashford, Ralph P. Hall & Nicholas A. Ashford, *Broadening Capital Acquisition with the Earnings of Capital as a Means of Sustainable Growth and Environmental Sustainability*, EURO. FIN. REV., Oct.-Nov. 2012, at 70-74.

6. Robert Ashford, Ralph P. Hall & Nicholas A. Ashford, *Broadening Capital Acquisition with the Earnings of Capital as a Means of Sustainable Growth and Environmental Sustainability*, EURO. FIN. REV., Oct.-Nov. 2012, at 70-74 (emphasis added).

7. Robert Ashford, *Why Working but Poor? The Need for Inclusive Capitalism*, 49 AKRON L. REV. 507, 510-17 (2016) (providing an overview of inclusive capitalism based on binary economics).

8. LOUIS O. KELSO & PATRICIA HETTER KELSO, DEMOCRACY AND ECONOMIC POWER: EXTENDING THE ESOP REVOLUTION THROUGH BINARY ECONOMICS 7, 21 (Ballinger Publ'g Co. 1986) (articulating a theory of "democratic capitalism" that can make "all consumers economically autonomous.") The term "binary" distinguishes two factors of production: labor and capital. The barrier to opportunity can be understood as the "diminished understanding of the importance of widespread ownership as a necessary component of widespread earning capacity and democracy [traceable to the] emergence of mainstream economics" Robert Ashford, *Economics, Democracy, and the Distribution of Capital Ownership*, 40 F. SOC. ECON. 361, 363 (2011). Another barrier is the disproportionate influence of "extractive" institutions over "inclusive" institutions. DARON ACEMOGLU & JAMES A. ROBINSON, WHY NATIONS FAIL: THE ORIGINS OF POWER, PROSPERITY, AND POVERTY 74-75 (2012) (defining "[i]nclusive economic institutions" as "those that allow and encourage participation by the great mass of people in economic activities that make the best use of their talents and skills and that enable individuals to make the choices they wish" and noting that inclusivity requires "secure private property, an unbiased system of law, and a provision of public services that provides a level playing field in which people can exchange and contract; it also must permit the entry of new businesses and allow people to choose their careers."). Accordingly, the overarching goals of binary economics include:

institutions that facilitate capital acquisition for more affluent individuals.[9] It envisions broadening access to the existing system of corporate finance to people who have historically encountered barriers to such systems to acquire income-generating portfolios of stock[10] by securing more equal access to competitive, individual property rights.[11] It also has particular relevance amidst transformational technological change,12 addresses social

increasing industrial productivity, investments in innovation, and reinforcing long-term wealth generation. *See* S. REP. NO. 94-690, at 99-100 (1976):

> Providing ownership opportunities not just to employees but to citizens at large could be accomplished through various devices. One example would be the establishment of funds which would accumulate personal savings on a tax-preferred basis and use them to acquire a diversified portfolio of equity shares in corporations. For instance, individuals with earned income not exceeding $20,000 could be allowed to save up to $3,000 a year in one or more funds and to deduct this amount from their taxable incomes.
>
> Whatever the means used, a basic objective should be to distribute newly created capital broadly among the population. Such a policy would redress a major imbalance in our society and has the potential for strengthening future business growth.
>
> To provide a realistic opportunity for more U.S. citizens to become owners of capital, and to provide an expanded source of equity financing for corporations, it should be made national policy to pursue the goal of broadened capital ownership.

9. *See* Robert Ashford & Demetri Kantarelis, *Enhancing Poor and Middle Class Earning Capacity with Stock Acquisition Mortgage Loans*, 11 ECON., MGMT., & FIN. MKTS. 11, 12 (2016).

10. *See* Robert Ashford, *Broadening the Right to Acquire Capital with the Earnings of Capital: the Missing Link to Sustainable Economic Recovery and Growth*, 39 F. SOC. ECON. 89, 89 (2009). Professor William Darity, Jr. and Professor Darrick Hamilton say that for about $80 billion per year (two percent of annual budget), the U.S. could create trust funds of between $500 and $50,000 to every newborn as a means of stimulating economic growth. John Ydstie, *Professors Suggest 'Baby Bonds' Could Fix Widening Inequality in The U.S.*, NAT'L PUB. RADIO (Jan. 9, 2018), https://t.co/nOcG8Sqbtd.

11. *See infra* Section III. The argument for subsistence income from capital retention also resembles an argument for a constitutional right to welfare which courts have uniformly rejected. *See* Susan Frelich Appleton, *Commentary—Professor Michelman's Quest for a Constitutional Welfare Right*, 1979 WASH. U. L. Q. 715 (1979). This Note uses the terms "property rights" and "ownership" interchangeably to refer to entitlements to the "exclusive use of valuable resources." RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 39 (9th ed. 2014). Essential to the binary approach, discussed *infra* at Section II, is to secure the competitive right to "acquire capital with the earnings of capital." Robert Ashford, *Beyond Austerity and Stimulus: Democratizing Capital Acquisition with the Earnings of Capital As a Means to Sustainable Growth*, 36 J. POST KEYNESIAN ECON. 179, 180 (2014).

12. *See infra* Section I.

anxieties occasioned by economic marginalization,[13] and has attracted endorsements from a growing number of mainstream economists.[14]

Recognized by its proponents as a distinct economic paradigm,[15] binary economics recognizes that (1) capital does work and distributes income,[16] (2) advancing technology "makes capital much more productive than labor,"[17] and (3) a broader distribution of capital acquisition with the earnings of capital promotes more growth than a narrower one.[18] As

13. *E.g.*, ROBERT B. REICH, SAVING CAPITALISM: FOR THE MANY, NOT THE FEW xii (2015).

> Confidence in the economic system has declined sharply. The apparent arbitrariness and unfairness of the economy have undermined the public's faith in its basic tenants. Cynicism abounds. . . . The threat to capitalism is no longer communism or fascism but a steady undermining of the trust modern societies need for growth and stability.

Cf. Employee Stock Ownership Plans (ESOP's), *Hearings Before Joint Econ. Comm.*, 94th Cong. 214-15 (1975) (statement of Louis O. Kelso):

> So close to breakdown is our myth-ridden, over-inflated, labor-strife-torn, craftsmanship-atrophied, debt-burdened, bureaucratized boondoggle economy, that steps to broaden the capital ownership base must be given priority over every other aspect of economic reform if we are to recapture the American innocence that once made the United States the epitome of a good society.

In mainstream news, political debate often collapses into stale arguments over the importance of (de)regulation, (cutting) welfare, (raising) taxes, etc. However, participants in such debates too often overlook unconventional but theoretically sound policy proposals premised on deeply shared values. *See* Miranda Perry Fleischer & Daniel Jacob Hemel, *Atlas Nods: The Libertarian Case for a Basic Income*, 3 WIS. L. REV. (forthcoming 2018) (showing how redistributive taxation comports with the underlying principles of minimal state libertarianism and classical liberalism).

14. *See Walls*, *supra* note 1 (referring to the work of Professor Robert Ashford, leading scholar in the field of binary economics):

> Paul Davidson, founding editor of The Journal of Post Keynesian Economics, endorses Ashford's work, calling it a "promising antidote to the eroding earning capacity of poor and middle-class people." Richard Hattwick, founding editor of The Journal of Socio-Economics, agrees, noting that Ashford's innovative approach to fuller employment and per capita growth based on capital productiveness and broadening property rights deserves a prominent place in mainstream economic analysis. Moreover, Demetri Kantarelis, founding editor of Global Business & Economics Review—who has co-authored several articles based on Ashford's scholarship—calls Ashford's scholarship "the most important contribution to economic theory in many decades."

15. *See, e.g.*, ROBERT ASHFORD & RODNEY SHAKESPEARE, BINARY ECONOMICS: THE NEW PARADIGM (1999).

16. Robert Ashford, *Binary Economics: The Economic Theory that Gave Rise to ESOPs*, 2007 OWNERS AT WORK, Winter 2006, at 13; Robert Ashford, *Unutilized Productive Capacity, Binary Economics and the Case for Broadening Capital Ownership*, 10 ECON., MGMT., & FIN. MKTS. 27 (2015).

17. Ashford, *Unutilized Productive Capacity*, *supra* note 16, at 27.

18. *See infra* Section II. The use of "capital" in this article (and as used in binary economics), "includes land, animals, structures, and machines—anything capable of being owned and employed in production. It does not include 'financial capital,' which [does not do work but rather] is a claim on, or ownership interest in, real capital." Ashford, *Beyond Austerity*, *supra* note 11, at 180 n.1. This is consistent with the foundational economic theorists (including Smith, Ricardo, Marx, Marshal, Walras, and Keynes). This usage contrasts with the usage in financial economics in which "capital" usually means "financial capital." However, many writers use a broader definition of capital that includes

technology advances, production becomes more capital intensive, automation increases, jobs become obsolete, and workers become comparatively more expensive to employ than smart machines.[19] While the rate of job displacement by AI is subject to much speculation,[20] startling breakthroughs in artificial intelligence (AI) have drawn renewed attention to the distinction between human labor and capital assets as wealth producers.[21]

This Note reviews the state of property rights in international law and suggests that binary economics merits greater attention in a time of ever more advanced automation technologies. The first section discusses the potential impact of AI on labor income and the global economy. The second section explores the fundamental principles of binary economics, its economic implications, and alleged theoretical weaknesses. The third section highlights several positive international obligations, conventions, and norms concerning economic resilience through the lens of binary economic reasoning. The Note concludes with a call for increased research and experimentation in economic democratization based on binary economic principles.

money, human capital, and refers to natural resources, physical capital, technology, corporate stock, knowledge, and/or anything else that can enhance an individual's capacity to perform economically useful work or generate income. This broader definition tends to confuse real capital assets (tools, machines, factories)—which, according to binary economics, do work—with financial capital (securities, bonds, notes, and shares)—which do not. Telephone Interview with Robert Ashford, the Bond, Schoeneck & King Distinguished Professor of Law, Syracuse Univ. Coll. of Law (Nov. 1, 2017) [hereinafter "Ashford Interview"].

19. *See infra* Section I. This dynamic runs contrary to economic orthodoxy which states that technology increases worker efficiency.

20. *See, e.g.,* Judy Wajcman, *Automation: Is It Really Different this Time?*, 68 BRITISH J. SOC. 1, 124 (2017) ("[T]here is little convincing evidence that large-scale technological unemployment is actually happening or will happen in the immediate future."); Joss Fong (@JossFong), *Will robots and AI cause mass unemployment? There are reasons to be skeptical.*, TWITTER (Nov. 13, 2017, 11:11 AM), https://twitter.com/JossFong/status/930151068494974981.

21. *See, e.g.,* Gar Alperovitz & Steve Dubb, *The Possibility of a Pluralist Commonwealth and a Community-Sustaining Economy*, 22 GOOD SOC'Y 1, 10 (2013) ("At the heart of the spectrum of emerging institutional change is the traditional radical principle that the ownership of capital should be subject to democratic control."); Stefan J. Padfield, *The Inclusive Capitalism Shareholder Proposal*, 17 U.C. DAVIS BUS. 147, 154 (2017) ("[I]t may be true that corporate managers have a fiduciary duty to implement Inclusive Capitalism financing once they recognize the shareholder wealth implications . . . .").

I. THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE CONTINUING RELIABILITY OF LABOR INCOME

Cultural anxiety over technological innovation has a long and storied history.[22] While predictions of widespread technological unemployment during periods of technological innovation have proved largely inaccurate, some workers were indeed displaced during the Industrial Revolution and never lived to reap the benefits of increased factory productivity.[23] Today, the reliability of labor income has again come into question with the advent of advanced automation technology and artificial intelligence (AI).[24]

Powered by investments and education initiatives worldwide,[25] AI is undergoing rapid increases in capabilities and applications.[26] This trend suggests that machines may displace some forms of labor,[27] render millions

22. Joel Mokyr, Chris Vickers & Nicolas L. Ziebarth, *The History of Technological Anxiety and the Future of Economic Growth: Is This Time Different?*, 29 J. ECON. PERSP. 31, 31 (2015).

23. *Id*. at 38.

24. As used in this Note, "AI" refers to machines that automate complex tasks. Industry analysts use AI as an umbrella term for a host of interrelated technologies including "speech recognition, natural language processing, semantic technology, biometrics, machine and deep learning, swarm intelligence, and chatbots or voice bots." Christopher Stancombe et al., *Turning AI Into Concrete Value: The Successful Implementers' Toolkit*, CAPGEMINI DIGITAL TRANSFORMATION INSTITUTE 5, https://www.capgemini.com/wp-content/uploads/2017/09/dti-ai-report_final1.pdf (last visited Nov. 17, 2017). "Artificial intelligence (AI) refers to a set of computer science disciplines aimed at the scientific understanding of the mechanisms underlying thought and intelligent behavior and the embodiment of these principles in machines that can deliver value to people and society." The Dawn of Artificial Intelligence, *supra* note 4, at 9 (2016). Notably, technological convergence is central to automation. *See, e.g.*, Noela Invernizzi & Guillermo Foladori, *Nanotechnology Implications for Labor*, 7 NANOTECHNOLOGY L. & BUS. 68, 77 (2010) ("[T]he multifunctional, trans-sectoral nature of many nanotechnology products, will favor a greater centralization of industrial sectors, such as the growing merger of the food, pharmaceutical and cosmetics industries.").

25. The Dawn of Artificial Intelligence, *supra,* note 4, at 26 (statement by Greg Brockman, Co-Founder and CTO, OPENAI) ("This year, Chinese teams won the top categories in a Stanford annual image recognition context. South Korea declared a billion-dollar AI fund. Canada actually produced a lot of the technologies that have kicked off the current boom. And they recently announced their own renewed investment into AI.")

26. *E.g.*, Gill A. Pratt, *Is a Cambrian Explosion Coming for Robotics?*, 29 J. ECON. PERSP., 51, 59, 60 (2015) (concluding that "[r]obots are already making large strides in their abilities, but as the generalizable knowledge representation problem is addressed, the growth of robot capabilities will begin in earnest, and it will likely be explosive. The effects on economic output and human workers are certain to be profound.").

27. The rate and magnitude of potential job displacement attributable to automation has become the subject of intense debate. Several commenters sharply question the conclusion that the future will yield technological unemployment. *See, e.g.,* David H. Autor, *Why Are There Still So Many Jobs? The History and Future of Workplace Automation*, 29 J. ECON. PERSP. 3, 27 (2015) ("[A] significant stratum of middle-skill jobs combining specific vocational skills with foundational middle-skills levels of literacy, numeracy, adaptability, problem solving, and common sense will persist in coming decades."); *see also* Tom Lehman, *Countering the Modern Luddite Impulse*, 20 INDEP. REV. 265, 280 (2015) ("Ongoing automation is not likely to reduce the total number of jobs but instead will change the types of jobs that people do or shift people from the role of wage-earning laborers to the role of rent-earning

of jobs obsolete,[28] and exert downward pressure on wages. While the extent and pace of displacement are highly contested,[29] some analysts estimate that "Almost half the activities people are paid almost $16 trillion in wages to do in the global economy have the potential to be automated by adapting currently demonstrated technology."[30] Others estimate that "about a third of workplace tasks can be automated for the majority of workers."[31] This could equate to a "disruptive tidal wave" in employment, with as much as six percent of jobs being eliminated by 2021.[32] "The proportion of jobs threatened by automation in India is 69 percent, 77 percent in China and as high as 85 percent in Ethiopia."[33] More than 5.1 million jobs may be displaced by automation worldwide as early as 2020.[34] Some posit truly

capitalist (robot) owners."). Consequently, the crux of Section I of this Note hinges on at least a decades-long time horizon. *See generally* Vice, *infra* note 29; James Bessen, *How Computer Automation Affects Occupations: Technology, Jobs and Skills* (Bos. Univ. Sch. of Law L. & Econ., Working Paper No. 15-49, 2016); Martin Ford, *Could Artificial Intelligence Create an Unemployment Crisis*, 56 COMM. OF THE ACM 37 (2013); ERIC BRYNJOLFSSON & ANDREW MCAFEE, THE SECOND MACHINE AGE: WORK, PROGRESS AND PROSPERITY IN A TIME OF BRILLIANT TECHNOLOGIES (2014).

28. EXEC. OFFICE OF THE PRESIDENT, ARTIFICIAL INTELLIGENCE, AUTOMATION, AND THE ECONOMY, (Dec. 20, 2016), https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Artificial-Intelligence-Automation-Economy.PDF (estimating "threatened jobs over the next decade or two range from 9 to 47 percent" and stating that it is unknown how rapidly the changes might happen and "how concentrated the losses are in specific occupations that are hard to shift from."). *See also*, COMM. FOR ECON. DEV. OF AUSTRALIA, *Australia's Future Workforce?*, 60 (2015) ("40 per cent of current jobs have a high probability (greater than 0.7) of being computerised or automated in the next 10 to 15 years. . . . [which] is comparable to the UK.")

29. Commenters point out that throughout history technology has created more jobs than it has driven into obsolescence. *See, e.g.*, Autor, *supra* note 27 and accompanying text; Tom Lehman, *supra* note 27 and accompanying text.

Economic and social theorist Jeremy Rifkin predicts two generations of "massive employment" will be required to build new energy and digital infrastructures before a more automated, smart, "sharing economy" can emerge. Vice Documentary Films, *The Third Industrial Revolution: A Radical New Sharing Economy*, YOUTUBE (Feb. 13, 2018), https://youtu.be/QX3M8Ka9vUA?t=1h12m57s.

30. James Manyika et al., *A Future That Works: Automation, Employment, and Productivity*, MCKINSEY GLOBAL INSTITUTE (2017). The report goes on to say that "[w]hile less than 5 percent of all occupations can be automated entirely using demonstrated technologies, about 60 percent of all occupations have at least 30 percent of constituent activities that could be automated. More occupations will change than will be automated away." *Id.*

31. ALEX CAMPOLO ET AL., AI NOW 2017 REPORT 3 (Andrew Selbst & Solon Barocas eds. 2017), https://ainowinstitute.org/AI_Now_2017_Report.pdf.

32. Harriet Taylor, *AI Will Eliminate 6 Percent of Jobs in Five Years, Says Report*, CNBC (Sept. 12, 2016, 5:03 PM), https://www.cnbc.com/2016/09/12/ai-will-eliminate-six-percent-of-jobs-in-five-years-says-report.html.

33. *Speech by World Bank President Jim Yong Kim: The World Bank Group's Mission: To End Extreme Poverty*, THE WORLD BANK (Oct. 3, 2016), http://www.worldbank.org/en/news/speech/2016/10/03/speech-by-world-bank-president-jim-yong-kim-the-world-bank-groups-mission-to-end-extreme-poverty.

34. WORLD ECONOMIC FORUM, THE FUTURE OF JOBS: EMPLOYMENT, SKILLS, AND WORKFORCE STRATEGY FOR THE FOURTH INDUSTRIAL REVOLUTION, 13 (2016), http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf (projecting "net employment impact of more than 5.1

revolutionary implications, claiming that AI represents a nascent economic force unlike anything in historical experience, including the Industrial Revolution.[35] In fact, according to some futurists, labor markets may be approaching the cusp of *geometric* change, far outpacing the rate at which farming and factory work was automated in the twentieth century.[36] "The next wave of economic dislocations won't come from overseas," [37] President Obama remarked in 2016. "It will come from the relentless pace of automation that makes a lot of good, middle-class jobs obsolete."[38]

To reckon with the power of AI, one need look no further than self-driving cars. Automated vehicles (AVs)[39] promise to save hundreds of thousands of lives by reducing the number of traffic accidents caused by human error.[40] Car manufacturers are deploying AV technologies around

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million jobs lost to disruptive labour market changes over the period 2015–2020, with a total loss of 7.1 million jobs . . . and a total gain of 2 million jobs . . . .").

35. KLAUS SCHWAB, THE FOURTH INDUSTRIAL REVOLUTION 1-2, 34, 37, 47 (2016) (arguing that society now faces a transformative "technology revolution . . . unlike anything humankind has experienced before" which is evolving at an exponential pace. "The early signs point to a wave of labour-substituitive innovation across multiple industries and job categories which will likely happen in the coming decades." That structural factors (over-indebtedness and ageing societies) and systemic ones will "force us to rewrite our economic textbooks." And that insufficient demand for labor and a "winner-takes-all dynamic" would further "increase social tensions and conflicts and create a more volatile world."). *See generally* MARTIN FORD, RISE OF THE ROBOTS (2015); RICHARD SUSSKIND & DANIEL SUSSKIND, THE FUTURE OF THE PROFESSIONS: HOW TECHNOLOGY WILL TRANSFORM THE WORK OF HUMAN EXPERTS (2015). *See also* Amy Bernstein, *Globalization, Robots, and the Future of Work: An Interview with Jeffrey Joerres*, HARV. BUS. REV., Oct. 2016, at 74-79 (anticipating that "we'll see enormous waves of workers put out of work and ill prepared to take on very different jobs. This is going to create challenges that our institutions are not ready for.").

36. *Id.*

37. *Remarks by the President in Farewell Address*, THE WHITE HOUSE (Jan. 10, 2017), https://obamawhitehouse.archives.gov/the-press-office/2017/01/10/remarks-president-farewell-address (discussing education, unions and tax code reform as possible avenues for coping with technological change, warning, "if we don't create opportunity for all people, the disaffection and division that has stalled our progress will only sharpen in years to come").

38. *Id.*

39. NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., PRELIMINARY STATEMENT OF POLICY CONCERNING AUTOMATED VEHICLES 5 (2013) (defining fully autonomous vehicles as those which are "designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip," whereby the driver "is not expected to be available for control at any time during the trip." Thus, by design, "safe operation rests solely on the automated vehicle system."). *See also*, Panos J. Antsaklis et al., *An Introduction to Autonomous Control Systems*, INST. ELECTRICAL AND ELECTRONICS ENGINEERS CONTROL SYS., June 1991, at 5-13.

40. *E.g.,* Adrienne LaFrance, *Self-Driving Cars Could Save 300,000 Lives Per Decade in America*, THE ATLANTIC (Sept. 29, 2015), https://www.theatlantic.com/technology/archive/2015/09/self-driving-cars-could-save-300000-lives-per-decade-in-america/407956/; S. SINGH, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., CRITICAL REASONS FOR CRASHES INVESTIGATED IN THE NATIONAL MOTOR VEHICLE CRASH CAUSATION SURVEY 1 (2015), https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115 (reporting that an estimated ninety-four percent of crashes are attributable to human error).

the world[41] with numerous anticipated benefits including reduction of carbon emissions and increased mobility.[42] These pilot projects are generating complex debates around machine learning, ethics, and law.[43] AV will change laws[44] and force societies to grapple with challenges to privacy rights[45] and the loss of millions of jobs held by drivers of trucks, busses, taxis, and other vehicles.[46]

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41. *The Clockspeed Dilemma: What Does it Mean for Automotive Innovation?*, KPMG, Nov. 2015, at 23 ("[D]evelopments in autonomous vehicles may appear in any number of locations worldwide.").

42. NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., PRELIMINARY STATEMENT OF POLICY CONCERNING AUTOMATED VEHICLES (2013):

> Vehicle control systems that automatically accelerate and brake with the flow of traffic can conserve fuel more efficiently than the average driver. By eliminating a large number of vehicle crashes, highly effective crash avoidance technologies can reduce fuel consumption by also eliminating the traffic congestion that crashes cause every day on our roads. Reductions in fuel consumption, of course, yield corresponding reductions in greenhouse gas emissions . . . Preventing significant numbers of crashes will, in addition to relieving the enormous emotional toll on families, also greatly reduce the enormous related societal costs—lives lost, hospital stays, days of work missed, and property damage—that total in the hundreds of billions of dollars each year. Moreover, these dramatic changes will offer significant new opportunities for investments in the underlying technologies and employment in the various industries that develop, manufacture, and maintain them.

43. *See, e.g.*, Bryant Walker Smith, Note, *Automated Vehicles Are Probably Legal in the United States*, 1 TEX. A&M L. REV. 411 (2014); Yueh-Hsuan Weng et al., *The Legal Crisis of Next Generation Robots: On Safety Intelligence*, Presented on the Eleventh International Conference on Artificial Intelligence and Law (2007) (discussing intelligence consisting of "reactive behavior, deliberative behavior, adaptive behavior, cooperative behavior, and mutual understanding" enabling "intelligent interactions possible between robots and people and to allow robots to move about in complex environments" and "perform their tasks in unstructured environments"); David Shepardson & Bernie Woodall, *Tesla Crash Raises Concerns About Autonomous Vehicle Regulation*, REUTERS (July 1, 2016, 7:39 AM), http://www.reuters.com/article/us-tesla-autopilot/tesla-crash-raises-concerns-about-autonomous-vehicle-regulation-idUSKCN0ZH4VO; David C. Vladeck, *Machines Without Principals: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117, 150 (2014).

44. JOHN FRANK WEAVER, ROBOTS ARE PEOPLE TOO: HOW SIRI, GOOGLE CAR, AND ARTIFICIAL INTELLIGENCE WILL FORCE US TO CHANGE OUR LAWS 45 (2014); John O. McGinnis, *Accelerating AI*, 104 NW. U. L. REV. 1253, 1269 (2010) (describing "unparalleled cascades of benefits" and "new risks of catastrophe" arising from the acceleration of AI advancement).

45. Matthew Gillespie, Note, *Shifting Automotive Landscapes: Privacy and the Right to Travel in the Era of Autonomous Motor Vehicles*, 50 WASH. U. J.L. & POL'Y, 147, 169 (2016) ("[I]n order to protect the right to access to such transportation, privacy rights must be defined and adequately enforced."); *cf.* Kate Crawford & Jason Schultz, *Big Data and Due Process: Toward a Framework to Redress Predictive Privacy Harms*, 55 B.C. L. REV. 93, 93 (2014) (discussing how "Big Data" frustrates existing privacy protections).

46. DANIEL VERYARD ET AL., INT'L TRANSP. FORUM, MANAGING THE TRANSITION TO DRIVERLESS ROAD FREIGHT TRANSPORT 7 (2017) ("Of the 6.4 million driver jobs [projected to be needed across Europe and the United States by 2030] between 3.4 and 4.4 million would become redundant if driverless trucks are deployed quickly."); CTR. FOR GLOB. POLICY SOL., STICK SHIFT: AUTONOMOUS VEHICLES, DRIVING JOBS, AND THE FUTURE OF WORK 3 (2017) ("More than four million jobs will likely be lost with a rapid transition to autonomous vehicles. Driving occupations, including delivery and heavy truck drivers, bus drivers, and taxi and chauffeur drivers, would be heaviest hit.").

Consequently, AI has revived preexisting concerns about technological unemployment,[47] provoking renewed debate about potential interventions to stabilize consumer demand.[48] As AI demonstrates increasing success at executing ever more complex tasks—including performing surgery,[49] trading on the stock market,[50] performing legal analysis,[51] composing

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Other types of automated vehicles should be considered in an analysis of jobs in the transportation and logistics sector including unmanned sea vessels. *See generally* Esa Jokioinen, *Towards Remote Controlled Ships*, ROLLS-ROYCE PLC (Oct. 10, 2014), http://www.unmanned-ship.org/munin/wp-content/uploads/2014/10/MUNIN-WS@SMM-140909-4-Rolls-Royce-Approach-EJ.pdf; Isaac Arnsdorf, *Rolls-Royce Drone Ships Challenge $375 Billion Industry: Freight,* BLOOMBERG TECH. (Feb. 25, 2014), https://www.bloomberg.com/news/articles/2014-02-25/rolls-royce-drone-ships-challenge-375-billion-industry-freight; ROSE GEORGE, NINETY PERCENT OF EVERYTHING: INSIDE SHIPPING, THE INVISIBLE INDUSTRY THAT PUTS CLOTHES ON YOUR BACK, GAS IN YOUR CAR, AND FOOD ON YOUR PLATE (2013). *See also* Mark Purdy & Paul Daugherty, *Why Artificial Intelligence is the Future of Growth*, ACCENTURE 23 (2016), https://www.accenture.com/t20170524T055435__w__/ca-en/_acnmedia/PDF-52/Accenture-Why-AI-is-the-Future-of-Growth.pdf ("[P]olicy makers need to actively address and preempt the downsides of AI. Some groups will be affected disproportionately by these changes. To prevent a backlash, policy makers should identify the groups at high risk of displacement and create strategies that focus on reintegrating them into the economy.").

47. JOHN MAYNARD KEYNES, ECONOMIC POSSIBILITIES FOR OUR GRANDCHILDREN (1930), *reprinted in* ESSAYS IN PERSUASION, 358-73 (W. W. Norton & Co. 1963) (defining technological unemployment as "unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour"); Ford, *supra* note 27, at 37-38:

> [T]here are good reasons to be concerned that advances in artificial intelligence and robotics are rapidly pushing us toward an inflection point where the historical correlation between technological progress and broad-based prosperity is likely to break down—unless our economic system is adapted to the new reality . . . The percentage of people who are paid primarily to engage in truly creative or non-routine occupations is fairly small . . . As progress continues, it seems certain that more and more jobs and tasks will move from the 'non-routine' column to the 'routine' column, and as a result, an ever increasing share of work will become susceptible to automation. This goes to the heart of why the historical record many not be predictive with regard to technological unemployment. In order to remain essential to the production process, workers will have to make a historically unprecedented transition. Rather than simply acquiring new skills and moving to another routine job, workers will have to instead migrate to an occupation that is genuinely non-routine and therefore protected from automation—and they may have to do this rapidly and repeatedly in order to remain ahead of the advancing frontier.

48. *E.g.*, Richard McGahey, *Universal Basic Income and the Welfare State* 1 (Institute for New Economic Thinking, Working Paper No. 2863954, 2016) ("[E]vidence on technological displacement seems too uncertain to justify major disruptions in the welfare state. . . . Rather than a historically unique event, advanced technology may just be the latest factor to harm both labor's ability to bargain and overall macroeconomic performance by contributing to weaker overall demand and growing inequality."); Ashford, et al., *Broadening Capital Acquisition*, *supra* note 6, at 70.

49. Sveta McShane, *The Future of Surgery is Robotic, Data-Driven, and Artificially Intelligent*, SINGULARITY HUB (Oct. 11, 2016), https://singularityhub.com/2016/10/11/the-future-of-surgery-is-robotic-data-driven-and-artificially-intelligent/.

50. Cade Metz, *The Rise of the Artificially Intelligent Hegde Fund*, WIRED (Jan. 21, 2016), https://www.wired.com/2016/01/the-rise-of-the-artificially-intelligent-hedge-fund/.

51. Chris Sorensen, *Big law is having its Uber moment*, MACLEAN'S (Jan. 16, 2017), http://www.macleans.ca/economy/business/big-law-is-having-its-uber-moment/; Michael Mills, *Artificial Intelligence in Law: The State of Play 2016*, THOMSON REUTERS, http://www.neotalogic.com /wp-content/uploads/2016/04/Artificial-Intelligence-in-Law-The-State-of-Play-2016.pdf (last visited

symphonies,[52] shaping elections,[53] coaching in the workplace,[54] replicating itself,[55] and winning citizenship rights not enjoyed by many humans[56]—calls have grown increasingly urgent[57] for significant legal, political, and

Sept. 27, 2017) ("Cognitive technologies in the law are riding a wave of ever smarter algorithms, infinite scaling of computer power by faster chips and cloud-clustered servers, intense focus by companies led by seasoned experts, and an ever-greater demand from clients for cheaper, faster, better services."); Blake A. Klinkner, *Artificial Intelligence and Virtual Law Offices Expected to Be Top Technological Trends Impacting the Legal Profession in 2017*, 40 WYO. LAW. 52, 52 (2017) (noting that artificial intelligence is becoming capable of "analyzing historical judicial rulings and jury verdicts in order to simulate and predict the outcomes of future lawsuits . . . analyzing an opposing counsel's past legal maneuvering in order to make predictions as to how that counsel will try future cases"); Christian Barker, *Artificial Intelligence: Direct and Indirect Impacts on the Legal Profession*, 19 TORTSOURCE 1, 4 (2017) (noting "vast indirect effects on the legal services industry"); Daniel Ben-Ari et al., *"Danger, Will Robinson"? Artificial Intelligence in the Practice of Law: An Analysis and Proof of Concept Experiment*, 23 RICH. J.L. & TECH. 3, 64 (2017) (noting reduced demand for lawyers in the future).

52. Stacy Liberatore, *The AI That Can Write A Symphony Just For You: Headset Claims To Be Able To Lift Wearer's Mood With A Personalized Score Made From Their Brain Waves*, DAILYMAIL (Jan. 17, 2017), http://www.dailymail.co.uk/sciencetech/article-4129678/The-AI-write-symphony-just-you.html

53. *See, e.g.,* John Markoff, *Automated Pro-Trump Bots Overwhelmed Pro-Clinton Messages, Researchers Say*, N.Y. TIMES (Nov. 17, 2016), https://www.nytimes.com/2016/11/18/technology/automated-pro-trump-bots-overwhelmed-pro-clinton-messages-researchers-say.html. "The way Russia has exploited social media to sow confusion and discontent across the world—that's also an AI problem. Artificial intelligence is becoming tightly woven into nearly every aspect of society." Katharine Dempsey, *Democracy Needs a Reboot for the Age of Artificial Intelligence*, THE NATION (Nov. 8, 2017) https://www.thenation.com/article/democracy-needs-a-reboot-for-the-age-of-artificial-intelligence/. *See* Julia Angwin et al., *Facebook Enabled Advertisers to Reach 'Jew Haters,'* PROPUBLICA (Sept. 14, 2017) https://www.propublica.org/article/facebook-enabled-advertisers-to-reach-jew-haters (investigating how Facebook's algorithm "automatically transforms people's declared interests into advertising categories" enabling exploitation of voter animus)*; see also* Dhiraj Murthy et al., *Bots and Political Influence: A Sociotechnical Investigation of Social Network* Capital, 10 INT'L J. COMM. 4952, 4955, 4967 (2016) (examining the phenomenon of how "social media bots—computer programs or algorithms controlling accounts on social media" can and do exert influence in political communication.)

54. Jeanne Meister, *The Future of Work: How Artificial Intelligence Will Transform The Employee Experience*, FORBES (Nov. 9, 2017, 3:08 PM), https://www.forbes.com/sites/jeannemeister/2017/11/09/the-future-of-work-how-artificial-intelligence-will-transform-the-employee-experience (discussing how chatbots can streamline the workplace by providing a range of services including scheduling meetings, automatically generating documents, and providing personalized health data and concluding that businesses should "consider embracing a productivity chatbot as your newest HR team member.")

55. Cade Metz, *Building A.I. That Can Build A.I.*, N.Y. TIMES (Nov. 5, 2017), https://nyti.ms/2j1KU0d ("Google may soon find a way to create A.I. technology that can partly take the humans out of building the A.I. systems that many believe are the future of the technology industry.").

56. Cleve R. Wootson Jr., *Saudi Arabia, Which Denies Women Equal Rights, Makes A Robot A Citizen*, WASH. POST (Oct. 29, 2017), https://www.washingtonpost.com/news/innovations/wp/2017/10/29/saudi-arabia-which-denies-women-equal-rights-makes-a-robot-a-citizen/.

57. *E.g.,* James M. Hennessy, *Handling Human-Created Risks*, 56 JURIMETRICS J. 319, 327 (2016) ("The pace of change is accelerating and the margin for error is shrinking."). *See also* Olivia Solon, *More Than 70% Of US Fears Robots Taking Over Our Lives, Survey Finds*, GUARDIAN (Oct. 4, 2017), https://www.theguardian.com/technology/2017/oct/04/robots-artificial-intelligence-machines-us-survey.

economic measures to ensure that the risks and benefits of AI are distributed fairly.[58]

The precise impact of AI is impossible to predict, particularly given its potential impact on financial markets,[59] consumption patterns,[60] and the legal system.[61] Yet its increasing sophistication raises questions about the long-term reliability of jobs, labor income, and aggregate demand.[62] To the extent that AI replaces human workers, it will suppress wages and slow economic growth.[63] This possibility has stimulated a renewed debate about

58. *See, e.g.*, Dempsey, *supra* note 53 (quoting deep learning expert Yoshua Bengio, "AI will probably exacerbate inequalities, first with job disruptions—a few people will benefit greatly from the wealth created, [while] a large number will suffer because of job loss—and second because wealth created by AI is likely to be concentrated in a few companies and a few countries."); David Rotman, *Who Will Own the Robots?*, MIT TECH. REVIEW (June 16, 2015), https://www.technologyreview.com /s/538401/who-will-own-the-robots; Richard B. Freeman, *Who Owns the Robots Rules the World*, IZA WORLD OF LABOR, https://wol.iza.org/articles/who-owns-the-robots-rules-the-world/long (last visited Oct. 12, 2017) (noting the critical nature of the "distribution of ownership of robots and related machines" and concluding that "[a]s companies substitute machines and computers for human activity, workers need to own part of the capital stock that substitutes for them to benefit from these new 'robot' technologies. Workers could own shares of the firm, hold stock options, or be paid in part from the profits."); James S. Albus, *Robots and the Economy*, 18 THE FUTURIST 32, 42 (1984) (arguing for distributed private ownership of stock in automated robotics and associated companies and personal ownership of individual robots as means of allocating increased profits generated by automated manufacturing).

59. Lawrence G. Baxter, *Adaptive Financial Regulation and Regtech: A Concept Article on Realistic Protection for Victims of Bank Failures*, 66 DUKE L.J. 567, 602 (2016) ("automation will produce an ever-expanding range of regulatory techniques.").

60. Brett Frischmann & Evan Selinger, *Utopia?: A Technologically Determined World of Frictionless Transactions, Optimize Production, and Maximal Happiness*, 64 UCLA L. REV. DISCOURSE 372, 391 (2016) ("Humans are naturally inefficient. We are very costly beings to sustain."). Michal S. Gal & Niva Elkin-Koren, *Algorithmic Consumers*, 30 HARV. J.L. & TECH. 309, 352 (2017) ("We are standing on the verge of a brand-new world with respect to how we buy and sell. Roles that for centuries have been performed by humans will soon be transferred to algorithms.").

61. Curtis E.A. Karnow, Note, *Liability for Distributed Artificial Intelligences*, 11 BERKELEY TECH. L.J. 147, 204 (1996) (arguing that courts will be challenged in evaluating liability for artificial intelligences gone awry, noting that "We may know that AIs are involved as one of an infinite number of causes in fact. But against the background of ephemeral, distributed, polymorphic processing elements, judges will not be able to pluck out specific program applets, or human agencies, as proximate causes").

62. SELIM JAHAN, U.N. DEV. PROGRAMME, U.N. HUMAN DEVELOPMENT REPORT 98, 101 (2015) (recommending policy instruments to avoid outcomes whereby "[r]ows of desks could become empty, not because workers are unfit for their purpose, but because that purpose no longer exists" and noting that workers overall are "getting a smaller share of total corporate income based on analysis from 27 developed countries and 28 developing countries").

63. BRYNJOLFSSON & MCAFEE, *supra* note 27, at 232.

> As digital labor becomes more pervasive, capable, and powerful, companies will be increasingly unwilling to pay people wages that they'll accept and that will allow them to maintain the standard of living to which they've been accustomed. When this happens, they remain unemployed. This is bad news for the economy, since unemployed people don't create much demand for goods and overall growth slows down. Weak demand can lead to further

the future of labor, income, and consumption[64]—and the possibility of a parallel expansion of capital ownership.[65]

While no existing enforceable legal norms require or afford compensation for the economic impacts of technological change, the current

deterioration in wages and unemployment as well as less investment in human capital and in equipment, and a vicious cycle can take hold.

See also, Bessen, *supra* note 27, at 30 ("[C]omputer automation of an occupation is associated with increased demand for that occupation, partly by substituting for the inputs of other occupations. . . . [A]lthough computer automation is not associated with job losses overall, specific groups of occupations are negatively affected.").

64. *See, e.g.*, Estlund, *infra* note 226; Vivek Wadhwa, *We Need A New Version Of Capitalism For The Jobless Future*, WASH. POST (July 20, 2015), https://www.washingtonpost.com/news/innovations/wp/2015/07/20/we-need-a-new-version-of-capitalism-for-the-jobless-future/ (suggesting economic reforms); Paul Mason, *Paul Mason: What Would Keynes Do?*, NEW STATESMAN (June 12, 2014), https: // www. newstatesman. com/ economics/ 2014/ 06/ paul- mason- what- would- keynes-d (uncoupling work and income); Max Koch, *Welfare after Growth: Theoretical Discussion and Policy Implications,* 3 INT'L J. SOC. QUALITY 1, 17 (2013) (comparing policy proposals addressing climate change, inequality, economic growth, and consumption); Jeremy Rifkin, *A New Social Contract*, 544 ANNALS AM. ACAD. POL. & SOC. SCI. 16, 25 (1996) (inquiring into whether every member of society, has "a right to participate in and benefit from the productivity gains of the information and communication technology revolutions").

65. Pratt, *supra* note 26, at 59:

> Imagine a hypothetical economy in which everyone owned a robot and sent their robot to work in their stead. In such a world, the economy could proceed without a hitch, except that we would all have much more leisure time while our robotic stand-ins earned our keep. Of course, the matter of how to initially distribute, trade, and provide safeguards against bankruptcy for robot capital would have to be worked out. But essentially the present system of trading capital, where the intelligence (and significant luck) of investors determines who gets more and who gets less could provide at least some basis for distribution.

See also, Nils J. Nilsson, *Artificial Intelligence, Employment and Income*, 5 AI MAGAZINE, no. 2, 1984, at 13 ("[P]art of the automation-derived benefits realized by businesses and consumers should be used to help pay the salaries of the workers on public projects."); Noah Smith, *The End of Labor: How to Protect Workers From the Rise of Robots*, ATLANTIC (Jan. 14, 2013), https://www.theatlantic.com/business/archive/2013/01/the-end-of-labor-how-to-protect-workers-from-the-rise-of-robots/267135/ ("What if, when each citizen turns 18, the government bought him or her a diversified portfolio of equity? . . . This portfolio of capital ownership would act as an insurance policy for each human worker; if technological improvements reduced the value of that person's labor, he or she would reap compensating benefits through increased dividends and capital gains."). According to binary economics, with a widespread understanding and implementation of binary economic principles, such a diversified portfolio can be acquired, without the need for government subsidy, with the earnings of the capital acquired. Ashford, *Unutilized Productive Capacity*, *supra* note 16, at 35.

As used in this Note, "expansion of capital ownership," "democratization of capital," and similar phrases address the phenomenon of "capital deepening." *See, e.g.*, Armenter, *supra* note 3, at 6 (defining *capital deepening* as a condition in which "[b]etter or cheaper equipment replaces workers and redistributes income from labor to capital. The result is that production becomes more intensive in capital . . ."); Erik Brynjolfsson, Andrew McAfee & Michael Spence, *New World Order: Labor, Capital, and Ideas in the Power Law Economy*, FOREIGN AFF. 44, 47 (forecasting that capital deepening will be "accelerated further as robots, computers, and software (all of which are forms of capital) increasingly substitute for human workers. Evidence indicates that just such a form of capital-based technological change is taking place in the United States and around the world.")

acceleration of automation could trigger social upheaval[66] precipitating their creation. Various stock ownership diffusion plans have long been recommended as prophylactics against declines in the share of labor-based income and consumer demand in the face of efficient machines.[67] However, the current convergence of evolving international legal theory and accelerating technological change may now spur their reintroduction into meaningful political discourse.[68]

II. BINARY ECONOMICS

"*If democracy is someday to regain control of capitalism, it must start by recognizing that the concrete institutions in which democracy and capitalism are embodied need to be reinvented again and again.*"[69]

66. *See, e.g.,* Global Risks Report 2016, *infra* note 236; G. BOWMAN ET AL., CENTRE FOR RISK STUDIES, U. CAMBRIDGE, STRESS TEST SCENARIO: MILLENNIAL UPRISING SOCIAL UNREST SCENARIO 3 (hypothesizing a scenario in which "[s]ocial unrest poses a serious and growing societal threat. Social disenfranchisement and polarizing opportunity differences, particularly in the world's youth, is the current driving force. It is now systemic and has the potential to manifest in large scale simultaneous occurrences.").

In theory, AI developers and established business enterprises could protect future investments by championing measures to foster economic stability. *Cf.* Alberto Alesina & Roberto Perotti, *Income Distribution, Political Instability, and Investment*, 40 EURO. ECON. REV. 1203, 1203-28 (1996); *see also* Larry Catá Backer, *Multinational Corporations, Transnational Law: The United Nations' Norms on the Responsibilities of Transnational Corporations as a Harbinger of Corporate Social Responsibility in International Law*, 37 COLUM. HUM. RTS. L. REV. 287, 372 (2006).

67. *See, e.g.*, JAMES S. ALBUS, PEOPLES' CAPITALISM: THE ECONOMICS OF THE ROBOT REVOLUTION (1976).

68. *Cf.* Larry Catá Backer, *Moving Forward the UN Guiding Principles for Business and Human Rights: Between Enterprise Social Norm, State Domestic Legal Orders, and the Treaty Law That Might Bind Them All*, 38 FORDHAM INT'L L.J. 457, 458-60 (2015); *Employee Stock Ownership Plans (ESOP's)*, *Hearings Before Joint Econ. Comm.,* 94th Cong. 394 (1975) (statement of Louis O. Kelso) (announcing Floyd B. McKissick's plan to "use Second Income Plan financing to build the industrial base of Soul City, North Carolina, on broad capital ownership . . . .").

> Abraham Lincoln freed the slaves only in the legal sense. Technology was the slave's real emancipator. Technology freed the human slave by transferring his toil onto the tireless backs of non-human slaves driven by water, steam, petroleum, and electricity. But the Black man has been alienated a second time, because he never has owned, and never had a chance to own, the machines that replaced [him] . . . For all his good intentions, Lincoln didn't free the slaves. He fired them . . . This time, Black people are determined to be the slavemasters. But our slaves won't be weak and defenseless human beings. They will be the non-human things that produce industrial wealth . . . We intend to work, and to work hard. But we do not intend merely to work. We intend to own.

69. THOMAS PIKETTY, CAPITAL IN THE TWENTY-FIRST CENTURY 570 (Arthur Goldhammer trans., Belknap Press 2014). *See also* DOUGLASS C. NORTH, STRUCTURE AND CHANGE IN ECONOMIC HISTORY 17 (W. W. Norton & Co. 1981) ("Ultimately it is the state that is responsible for the efficiency of the property rights structure, which causes growth or stagnation or economic decline.").

A. The Fundamental Principles of Binary Economics

To understand how binary economics can address the potentially destabilizing consequences of the declining labor share of total income on consumer demand driven by the twin trends of concentrated ownership and advanced AI,[70] it is necessary to understand three inter-related foundational binary economic principles:

> 1. Both labor and (real) capital do work and (via property rights, including financial capital) distribute income;
>
> 2. Although advancing technology is widely understood to make labor more productive, it may also be understood to make capital more productive than labor in task after task (which helps to explain why profitable corporations continually employ capital to replace and vastly supplement the work of labor); and
>
> 3. The prospect of a broader distribution of capital acquisition with the present and future earnings of capital carries with it the prospect of more broadly distributed capital earnings in future years, which in turn will provide the market incentives to profitably employ more labor and capital in earlier years. In other words, the more broadly capital is acquired with the present and future earnings of capital (through borrowing, via capital credit), the more an economy will grow. The third of these premises (the principle of "binary growth") identifies a distinct cause of economic growth that is based on the distribution of capital acquisition with the present and future earnings of capital. The binary approach is distinct in that it is not found in the work of Adam Smith and all other economic approaches based on its foundation.[71]

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70. Concentration of capital ownership combined with increasingly powerful automation technology can contribute to declines in consumer demand. *See* Jonathan Hujsak, *The Fourth Industrial Revolution: Factors of Production Misalignment on a Global Scale*, COST MGMT., Oct. 2017, at 1. (observing the nonlinear evolution of technology and predicting that "[a] monotonic decline in consumer spending will be a driving force behind future economic downturns and ultimately undermine prospects for timely recovery" and warning of the possibility of a "violent cataclysm of social reorganization" or "a long-term period of decline and stagnation characterized by severe economic polarization and worsening resource shortages"); Rune Skarstein, *Overaccumulation of Productive Capital or of Finance Capital? A View from the Outskirts of a Marxist Debate*, 70 INVESTIGACIÓN ECONÓMICA 276, 52 (2011) ("[T]he present crisis was caused by overaccumulation of finance capital in relation to its profit possibilities. This crisis has turned into a general economic crisis characterised by increasingly deficient effective demand.").

71. Ashford, *Why Working but Poor?*, *supra* note 7, at 510-11.

The implications that flow from these three principles suggest that with modest changes in the existing global system of corporate finance the capital that literally buys itself (i.e. repays its cost of acquisition) primarily for the wealthiest investors could do so more quickly and more profitably as more and more people are included in the capital acquisition process.72 The binary growth principle explains how it is possible to do so without inflation or redistribution. According to binary economists:

> (1) the broader pattern of capital acquisition facilitated in a binary economy, (2) the consequent broader distribution of capital ownership, (3) the market based incentives for additional investment, employment, and consumption, and (4) the consequent growth are not redistributionary.[73]

This is because:

> (1) all related transactions are voluntary, at fair market value, not in violation of existing property or contractual rights, and competitively open to all would-be purchasers (including the existing shareholders via their retained earnings); and (2) no capital income is distributed to the binary beneficiaries unless and until all financial obligations of capital acquisition, maintenance, and operation required to produce that capital income have been paid.[74]

Coupled with widespread understanding of the prospects of enhanced aggregate growth and investment profits that seemingly flow from broadening capital acquisition, corporate fiduciaries of the world's major corporations, their shareholders, lenders, and underwriters, would have both the financial and moral incentive to expand the share of ownership of major corporate capital acquisition, provided that those corporations can capture a sufficient share of the profits to be derived from the enhanced distribution of consumer demand resulting from the broader distribution of capital acquisition.[75]

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72. *Id. See also* Ashford, *Beyond Austerity*, *supra* note 11, at 202.

73. Ashford, *Unutilized Productive Capacity*, *supra* note 16, at 43.

74. *Id.*

75. *Id.* at 47-49. *See also* Robert Ashford, *Memo on Binary Economics to Attorneys for Women and People of Color Re: What Else Can Public Corporations Do For Your Clients?*, 79 ST. JOHN'S L. REV. 1221, 1221 (2005); Robert Ashford, *Binary Economics, Fiduciary Duties and Corporate Social Responsibility: Comprehending Corporate Wealth Maximization for Stockholders, Stakeholders, and Society*, 76 TUL. L. REV. 1531, 1531 (2002).

B. The Originator and Early History of Binary Economics

In 1958, Louis Kelso observed that economic sustainability requires broad-based inclusivity in capital ownership.[76] Technological advancement, he reasoned, makes capital, not labor, more productive.[77] Thus in the context of advancing automation, to distribute the consumer demand needed to profitably promote technologically achievable growth in a capitalist economy, a broadening distribution of capital ownership and capital is needed to replace and supplement the declining labor share of total income resulting from its declining contribution to total production.[78]

On this basis, Kelso developed the theory of binary economics, which principally aims to expand private ownership of capital owned in the form of common stock to more productively distribute capital-based earning power.[79] Under this theory, consumer demand would be substantially supplemented by capital earnings by expanding the distribution of capital

76. LOUIS O. KELSO & MORTIMER J. ADLER, THE CAPITALIST MANIFESTO 218 (1958) (describing how "private property in capital in an industrial society eventually becomes untenable unless its ownership is broadly diffused . . . ."); *See also* LOUIS O. KELSO & PATRICIA HETTER, TWO-FACTOR THEORY: THE ECONOMICS OF REALITY 19-23, 141-43 (1967).

77. *Employee Stock Ownership Plans (ESOP's)*, *Hearings Before Joint Econ. Comm.,* 94th Cong. 393-94 (1975) (statement of Louis O. Kelso) (arguing that, contrary to mainstream economic analysis, "[t]echnological change does not raise the productiveness (or 'productivity') of labor—— ever." But rather, it "raises the productiveness of capital instruments, both through facilitating the addition of more capital instruments, and through the addition or substitution of better capital instruments").

78. KELSO & HETTER, *supra* note 8, at 46-47 (1986) (advancing a notion of "simulfinancing" whereby acquisition of corporate capital assets is paired with a like value for "financially underpowered consumers" as a solution to the problem of declining spending power. "[A]s the production of goods and services constantly changes from labor intensive to capital intensive, the sources of consumer income must make the same transition."); Robert Ashford, *Louis Kelso's Binary Economy*, 25 J. SOCIO-ECON. 1, 2 (1996).

79. Ashford, *supra* note 78 ("[I]ndividual prosperity and sustained growth require widespread individual participation in production not only as workers but increasingly as owners of productive capital."). *See also,* Thomas Piketty, *Putting Distribution Back at the Center of Economics: Reflections on Capital in the Twenty-First Century*, 29 J. ECON. PERSP. 67, 82 (2015) (observing that arguably the most important reason why the rate of return on capital relative to the growth rate of the economy might be high in the twenty-first century is due to unequal access to high financial returns).

acquisition and ownership of AI-intensive industries[80] and facilitating the availability of dividend-earning shares efficiently among the citizenry.[81]

The theory rests on the "binary" sources of wealth production: human (labor) and non-human (capital).[82] According to binary economics, capital — the "nonhuman factor of production" — becomes increasingly more productive than labor with advances in automation; and as a result, relative to capital employment, labor becomes increasingly costly to employ.[83] Indeed, this trend is borne out by recent research. Major increases in corporate wealth since the 1850s correspond to "discontinuous, sometimes explosively large, changes in productive capacity," yielding skewed distributions of demand.[84] Binary economics aims to mitigate disruption by incentivizing "broader and more effective private capital ownership" and the "expansion of privately-owned competitive enterprise."[85]

Reforms proposed by binary economists have attracted limited attention, and also some scathing criticism.[86] For instance, some contend that the

80. *E.g.,* Freeman, *supra* note 58 ("Workers can benefit from technology that substitutes robots or other machines for their work by owning part of the capital that replaces them."); *See generally* Ashford, *Why Working but Poor?*, *supra* note 7 (discussing the feasibility of overcoming collective-action problems through an ESOP-like system backed by various tax incentives); Smith, *supra* note 65; Ashford, *Unutilized Productive Capacity*, *supra* note 16, at 24-25; Geoffrey D. Korff, *Reviving the Forgotten American Dream*, 113 PENN ST. L. REV. 417, 459 (2008) (arguing that "binary economics" appears to be a viable theoretical framework for enabling a wealthier America via "reasonable, voluntary, market-based" measures for broader capital ownership. "The advantage of the binary approach is that it identifies the right to acquire capital with the earnings of capital as the essential right that must be extended to all people by opening the system of corporate finance").

81. This may be accomplished by indexing the allocation of stock to measures of job displacement attributable to AI. *Cf.* James S. Albus, *Robotics: Where Has it Been? Where is it Going?*, 6 ROBOTICS AND AUTONOMOUS SYSTEMS 199, 215 (1990) (advocating the creation of a "National Mutual Fund" (NMF) financed by a saving tax that invests in "Industrial Development Bonds" (IDB) to create new productive capacity, invest in research and development, and distribute NMF dividends and IDB interest to taxpayers). Further analysis of the mechanics and feasibility of this approach is beyond the scope of this Note. For instance, the details in implementing population-wide stock ownership may require government intervention to create tax incentives and authorize administrative oversight.

82. Ashford, *Louis Kelso's Binary Economy*, *supra* note 78.

83. *Id.*

84. *Robert Ashford, The Socio-Economic Foundation of Corporate Law and Corporate Social Responsibility*, 76 TUL. L. REV. 1187, 1188, 1201 (2002) (identifying bursts in innovation as one oversight in classical economic theory and observing that the resulting inefficiencies of capitalism are rooted in man-made structures including "technological progress and capital investment, subject to specified property rights and limited competition, aided by government policy (including the benefits of incorporation and protection of the financial markets)").

85. KELSO & HETTER, *supra* note 76, at 97.

86. *E.g.*, Timothy D. Terrell, *Binary Economics: Paradigm Shift or Cluster of Errors?*, 8 Q. J. AUSTRIAN ECON. 31, 32-50 (2005); William R. Levin, *The False Promise of Worker Capitalism: Congress and the Leveraged Stock Ownership Plan*, 95 YALE L.J. 148, 151 (leveraged ESOPs are "costly, harmful, and unnecessary, and should be abolished"). Other critics question the soundness of Kelso's theories in light of the failure of technology to devalue human labor. Andrew W. Stumpff, *Fifty Years of Utopia: A Half-Century After Louis Kelso's the Capitalist Manifesto, A Look Back at the Weird*

implementation of binary economics on a large scale could create inflation or unfairly restrict the lawful unlimited accumulation of capital.[87] In response, Professor Ashford maintains that these criticisms are without merit because they rest on a fundamental misunderstanding of binary economics.[88] The predictions of inflation assume an economy operating at full capacity in which market participants (acting under compulsion and/or irrationally) will implement ownership-broadening financing, whereas with binary-based principles, all ownership-broadening transactions are voluntary. Because no transactions are required, there is no reason to believe that capital financing will irrationally proceed on a voluntary basis in an economy in which the prospects of inflation exceed the real wealth-enhancing growth consequences of real capital financing.[89] Nor will the widespread understanding of binary growth and the voluntary pursuit of ownership-broadening financing impose any limit on lawful capital accumulation.[90] Market participants will be no less free to accumulate capital competitively in whatever way they choose, and the opportunities for profitable capital accumulation will increase as the distribution of capital acquisition broadens.[91]

A growing number of scholars in law, economics, and business have recently articulated policies—whether directly associated to Kelsonian theory or not—grounded in the principles of inclusive capitalism.[92] Professor Edward Kleinbard, for instance, highlights the conclusion that investments in lower-income households promotes "faster and more durable" economic growth.[93] Recurring economic downturns fueling the privatization of gains and the socialization of losses have provoked increased attention to the distribution of capital ownership.[94]

History of the ESOP, 62 TAX LAW. 419, 429 (2009) ("*The Capitalist Manifesto*'s central premise seems to have been proven wrong over the last half-century. Technology has not destroyed the value of labor.").

87. Terrell, *supra* note 86, at 41-43.

88. Ashford Interview, *supra* note 18.

89. *Id.*

90. *Id.*

91. *Id.*

92. Walls, *supra* note 17; Ydstie, *supra* note 10; *cf.* Dominic Barton, *Capitalism for the Long Term*, HARV. BUS. REV. (Mar. 2011), https://hbr.org/2011/03/capitalism-for-the-long-term (discussing the need for executives to focus on long term business interests inclusive of "all major stakeholders" including customers and improved governing principles to avert further challenges to "capitalism itself" following the "near meltdown of the financial system" and the ensuing Great Recession).

93. Edward D. Kleinbard, *Capital Taxation in an Age of Inequality*, 90 S. CAL. L. REV. 593, 656-60 (quoting the International Monetary Fund and noting that capital income taxation "can lead to higher growth if used to fund investment in the human capital of lower-income households.").

94. *See generally* PETER BARNES, WITH LIBERTY AND DIVIDENDS FOR ALL: HOW TO SAVE OUR MIDDLE CLASS WHEN JOBS DON'T PAY ENOUGH (Berett-Koehler 2014).

C. Binary Economics and Employee Stock Ownership Plans

Kelso successfully introduced a small portion of the proposals rooted in binary economics by transforming stock bonus retirement plans into corporate finance vehicles that became known as Employee Stock Ownership Plans (ESOPs).[95] Convinced by the correctness and singular importance of Kelso's views, Sen. Russell B. Long first advanced legislation creating the ESOP in 1974 as part of the Employee Retirement Income Security Act (ERISA) as a means of strengthening the free market system and re-industrializing the national economy.[96] Long's support of Kelso's ESOP continued for several decades until his retirement from the U.S. Senate and is reflected in an impressive list of federal laws.[97] Long successfully argued that a more equitable distribution of capital ownership would benefit both consumers and corporations.[98] The 1976 report of the Joint Economic Committee recommended that to "provide a realistic opportunity for more U.S. citizens to become owners of capital, and to provide an expanded source of equity financing for corporations, it should be made national policy to pursue the goal of broadened capital ownership"[99] ESOPs are seen as generally successful.[100] Although they have garnered criticism about their risks and their potential for abuse,[101] while

95. 26 U.S.C.A. § 401 (West 2003) (defining an ESOP as a "qualified pension, profit-sharing, or stock bonus plan."); Employee Retirement Income Security Act of 1974 (ERISA), 29 U.S.C.S. §§ 1001-1461 (1994); Treas. Reg. § 1.401(b)(iii) (West 1990).

96. For a general history of ESOPS, *see* JOSEPH RAPHAEL BLASI, EMPLOYEE OWNERSHIP: REVOLUTION OR RIPOFF? (Ballinger Publ'g Co. 1988); Elana Ruth Hollo, Note, *The Quiet Revolution: Employee Stock Ownership Plans and Their Influence on Corporate Governance, Labor Unions, and Future American Policy*, 23 RUTGERS L.J. 561 (1992).

97. *See* Jeffrey R. Gates, *A Brief History of U.S. ESOP Legislation,* 3 J. EMP. OWNERSHIP L. & FIN. 34, 75 (1991); Stumpff, *supra* note 86 at 429, 431 (While "Kelso's full binary economics program was never tried, only the ESOP part, and so we cannot say for sure what would have happened if it had been. . . . ESOPs remain decidedly helpful.")

98. *See* BLASI, *supra* note 96, at 1-29; Hollo, *supra* note 96.

99. U.S. CONG., J. ECON. COMM., 1976 J. ECONOMIC REP., S. REP. NO. 94-690, at 17 (1976).

100. Michael E. Murphy, *The ESOP at Thirty: A Democratic Perspective*, 41 WILLAMETTE L. REV. 655, 705 (2005) (explaining that ESOPs have "often succeeded as a support for participatory management practices . . . the ESOP is the only form of employee stock ownership that can serve meaningful democratic values . . . it is worth cultivating by appropriate legislative reform.").

101. *E.g.*, Deborah Groban Olson, *Union Experiences with Worker Ownership: Legal and Practical Issues Raised by ESOPs, TRASOPs, Stock Purchases and Co-Operatives*, 1982 WIS. L. REV. 729, 823 (1982) (characterizing ESOPs as "flexible mechanisms which unions and workers should understand and be able to analyze, use or fight with sophistication."); *cf.* Richard L. Doernberg & Jonathan R. Macey, *ESOPs and Economic Distortion*, 23 HARV. J. ON LEGIS. 103, 104 (1986) (arguing that ESOP legislation imposes "severe limitations and restrictions on corporate behavior" resulting in "inefficiency and distortion."); *see also* BLASI, *supra* note 96, at 64-84; Sean M. Anderson, *Risky Retirement Business: How ESOPs Harm the Workers They Are Supposed to Help*, 41 LOY. U. CHI. L.J.

also attracting suggestions as to how to preserve[102] and modernize them,[103] ESOPs serve as a model for the further enactment of policy rooted in binary economics.[104]

As envisioned by Kelso and others who agreed with the systemic importance of broadening the distribution of capital acquisition, ESOPs are only one means of broadening capital acquisition—the benefits of capital acquisition should be open not only to corporate employees, but to all people. As Sen. Long explained to Congress in 1983, the preservation of the free market system in the face of technological change requires an institutional framework that supports "a more democratic form of private property ownership."[105] Thus the wealth-enhancing theory underlying ESOPs, rather than their present limited implementation under federal law, reveals their true importance to enhanced economic prosperity and justice.[106] Based on the underlying theory, Kelso proposed a number of innovative stock ownership plans[107] which spurred ideas including "Capital Homesteading"[108] and "Stock Acquisition Mortgage Loans."[109]

1, 37 (2009) ("ESOPs expose workers to dramatic, uncompensated investment risks in comparison to diversified retirement plans.").

102. Lauren E. Berson & Nicholas L. Cushing, *Safeguarding Employee Stock Ownership Plans: Insurance as Assurance*, 26 HOFSTRA LAB. & EMP. L. J. 539, 582 (2009) ("By implementing a system of insurance, ESOPs will be able to provide the best of both worlds — a retirement plan that offers unlimited upside potential from stock increases and decreased downside risk from a mitigation of the possible harm from fiduciary misconduct and company bankruptcy.").

103. Hollo, *supra* note 96, at 562 ("[C]urrent legal doctrine is inadequate to meet the needs of today's marketplace and that ESOPs are challenging the traditional balance of power in corporations.").

104. KELSO & KELSO, *supra* note 8, at 8.

105. *Employee Stock Ownership Plans (ESOP's)*, *Hearings Before Joint Econ. Comm.*, 94th Cong. 214-15 (1975) (floor statement of Sen. Russell B. Long on the Employee Stock Ownership Act of 1983).

106. Ashford, *Binary Economics*, *supra* note 16, at 12-14.

107. These include Mutual Stock Ownership Plan (MUSOP); Consumer Stock Ownership Plan (CSOP), General Stock Ownership Plan (GSOP), Individual Capital Ownership Plan (ICOP); Commercial Capital Ownership Plan (COMCOP); Public Capital Ownership Plan (PUBCOP); and Residential Capital Ownership Plan (RECOP). KELSO & KELSO, *supra* note 8, at 59, 75, 85, 99.

108. NORMAN G. KURLAND, DAWN K. BROHAWN & MICHAEL D. GREANEY, CAPITAL HOMESTEADING FOR EVERY CITIZEN: A JUST FREE MARKET SOLUTION FOR SAVING SOCIAL SECURITY 27 (Center for Economic and Social Justice ed., 2004) (advocating a series of legal reforms centered on "democratization of productive credit," simplifying the tax code, and linking tax and monetary reforms to the goal of "expanded capital ownership").

109. Ashford & Kantarelis, *supra* note 9, at 14-15.

The realization and facilitation of some of these proposals could entail tax reforms which are beyond the scope of this Note. *See e.g., Federal Taxation and Economic Stability*, 57 YALE L.J. 1229, 1255 (1948) (noting that "use of taxes, banking policy and its arsenal of weapons for controlling the size and flow of national income" can be used to "promote the desirable level of private investment expenditures in relation to savings without direct government intervention in private business management"); *Cf.* Samuel B. Graves & Sandra A. Waddock, *Institutional Ownership and Control: Implications for Long-Term Corporate Strategy*, 4 EXECUTIVE 75, 81 (1990) (noting the importance of equity positions

D. The Magnitude of Binary Growth[110]

The principle of binary growth posits a qualitative connection between the distribution of capital acquisition and growth, but not the magnitude of growth. To understand the magnitude of the posited growth, it is necessary to focus on the first and second fundamental principles set forth above, and to consider the growth and distributive implications that flow from the difference between the widely understood concept of "productivity" and the less widely understood concept of *productiveness*.[111]

> The metric "labor productivity" is commonly used in the design and evaluation of economic policies. Productivity is a ratio; it is not a measure of output. It is calculated by dividing an output by a factor of input (labor or capital), that is, it is the amount of output per unit of input. In contrast, *productiveness* is a measure of the quality of being productive or the capacity for producing. Examples are a more productive machine that is capable of faster output (an example of capital productiveness) and a more productive worker who is capable of more creative or faster work and higher-quality outputs (labor productiveness) if his/her skills have been enhanced. As a statistical artifact, either can increase labor productivity. Productivity does no work; (physical) capital and labor do work.[112]

To provide a quantitative appreciation of the magnitude of binary growth based on the increasing productiveness of capital (an appreciation that is obscured by the conventional focus on increasing productivity as the primary explanation for economic growth), Professor Ashford offers but two of a myriad of examples of dramatic changes in the way that goods and services are produced as a result of advancing technology that have occurred since 1776 when Adam Smith first published *Wealth of Nations*:

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requiring longer time horizons "than one or two quarters" and recommending measures including "tax measures that provide incentives for long-term investments, for example in R&D . . . .").

110. Ashford describes the "binary growth principle" as the "direct result of corporations voluntarily deciding to operate in a potentially more profitable manner by ethically including their employees, customers, and neighbors in the process by which they acquire capital with the earnings of capital." Ashford, *supra* note 6, at 71.

111. Ashford, *Why Working but Poor?*, *supra* note 7, at 512 (defining productivity as "the ratio of the output of all factors of production, divided by the input of one factor, usually labor" and productiveness as "a special focus of binary economics, which retrospectively means 'work done' and prospectively means 'productive capacity'").

112. Nicholas A. Ashford, Ralph P. Hall & Robert Ashford, *Addressing the Crisis in Employment and Consumer Demand: Reconciliation with Environmental and Financial Sustainability*, EURO. FIN. REV., Oct.-Nov. 2012, at 68.

> Although most people believe that the primary role of capital in contributing to per-capita economic growth is to increase labor productivity, there is another (binary) way to understand the primary role of capital: to do an increasing portion of the total work done. According to the widely shared perception, per-capita growth might be understood by the example of a person sawing ten boards per hour with a handsaw and one hundred boards per hour with a machine saw. Thus, human productivity has increased tenfold. Most people do not usually think of saws, themselves, as doing work, but rather as merely enabling people to do a particular kind of work (such as sawing) or as enabling people to do such work more productively and to do more work per unit of time. But consider the example of a person who in one hour can haul (1) one sack one mile by carrying it, (2) ten sacks one mile with the help of a horse, and (3) one thousand sacks thirty miles with the help of a truck. From a binary perspective, the horse and truck are doing more than enabling the person to do more work; they are doing more of the total work; and the same can be said for saws and any capital employed in production. Thus, per-capita growth can be understood as capital increasing labor productivity, but it can also be understood as capital doing an ever-increasing portion of the total work done.[113]

These examples of technology are representative of countless other instances by which capital is increasingly employed to both replace and vastly supplement the work of labor. This binary understanding of the increasing productiveness of capital relative to labor reveals how:

> [I]n a private property, market economy, it is the capacity of capital both to do much more work and to distribute much more income and leisure that helps to explain how broadening capital acquisition with the earnings of capital promotes much greater employment of existing capacity (both labor and capital), capital accumulation, and growth than would result from merely redistributing a portion of the earning capacity of capital that is formed if it is more narrowly acquired.
>
> . . . .
>
> According to binary economics, however, in contributing to economic growth, capital does much more than increase the productivity of the people who work with it. Increasingly capital is doing both ever more and an increasing portion of the work, and

113. Ashford et al., *supra* note 6, at 70-71.

> therefore, absent redistribution and institutional restraints on its broader acquisition, would be distributing an increasing portion of the income. Per unit of output, a major economic incentive is generally to produce more with more productive capital and less labor. And as capital does ever more of the work, the recognition of its increasing ability to do work (its productive capacity) and distribute the income it earns or could earn if more broadly acquired (its distributive capacity) becomes increasingly important to achieving a virtuous cycle of growth.[114]

III. BINARY ECONOMICS AND THE ADVOCACY OF POSITIVE INTERNATIONAL RIGHTS

International human rights law has historically been confined to the protection of universal, non-derogable individual rights and liberties.[115] It emerged in the wake of World War II to deter and punish war crimes, genocide, and other "unimaginable atrocities that deeply shock the conscience of humanity."[116] Today international human rights encompass a shared understanding of human dignity in a just society.[117] United Nations member states have agreed to uphold the "conditions of stability and well-being" and promote "higher standards of living, full employment, and the conditions of economic and social progress and development."[118] Furthermore, transnational corporations (TNCs) have also undertaken de facto obligations to protect human rights.[119] As Professor Peter Spiro notes,

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114. Ashford, *Beyond Austerity*, *supra* note 11, at 188-89.

115. "Non-derogable" rights generally refer to rights which are fundamental. *See generally* Teraya Koji, *Emerging Hierarchy in International Human Rights and Beyond: From the Perspective of Non-derogable Rights*, 12 EUROPEAN J. OF INT'L L. 5 (2001). *Cf.* Eduardo Moises Penalver, *Redistributing Property: Natural Law, International Norms, and the Property Reforms of the Cuban Revolution*, 52 FLA. L. REV. 107, 110 (2000) (arguing that "the human rights model is the correct one for exploring the problems raised by property redistribution."). JACK DONNELLY, UNIVERSAL HUMAN RIGHTS IN THEORY AND PRACTICE 70 (Cornell Univ. Press 1989) ("Human rights are morally prior to and superior to society and the state").

116. Rome Statute of the International Criminal Court, July 17, 1998, 2187 UNTS 90, *reprinted in* 37 I.L.M. 1002 (1998).

117. Paolo G. Carozza, *Human Dignity*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL HUMAN RIGHTS LAW 345, 359 (Dinah Shelton ed., 2013); Guy Mundlak, *The Right to Work: Linking Human Rights and Employment Policy*, 146 INT'L LABOUR REV. 189, 212 (2007).

118. U.N. Charter art. 55.

119. Backer, *supra* note 66, at 372:

> TNCs must encourage social progress and development, adopt and internalize specific labor policies in their global operations, and contribute to [the] realization of such rights as the rights to development, adequate food and drinking water, the highest attainable standard of physical and mental health, adequate housing, privacy, education, freedom of thought, conscience, and

"today we find an increasingly consequential umbrella of individual rights protections in the form of international human rights norms"[120] including the right to economic development, employment, independence, and self-development.

This modernized conception of human rights has not yet addressed economic displacement.[121] International concern for economic security—including the right to food, housing, health services, education, and land[122]—remains largely aspirational[123] and not fully integrated into

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> religion and freedom of opinion and expression, and shall refrain from actions which obstruct or impede the realization of those rights.

(internal citations and quotes omitted).

120. Peter J. Spiro, *Treaties, International Law, and Constitutional Rights*, 55 STAN L. REV. 1999, 2000, 2001 (2003) ("In the modern era, international human rights norms played an important part in the expanded conception of domestic civil rights, while other individual rights were constrained in the face of foreign relations concerns. No account of twentieth-century constitutional rights is complete without international geopolitical referents.").

121. Scott Leckie, *Another Step Towards Indivisibility: Identifying the Key Features of Violations of Economic, Social and Cultural Rights*, 20 HUM. RTS. Q. 81, 124 (1998) ("[T]he international legal community has yet to come to terms with the fact that homelessness, hunger, social and economic exclusion, discrimination on the basis of poverty, displacement, illiteracy, unemployment, and many other social ills can and usually do constitute human rights violations."). Another instance of the harmonization of international law and binary economics is the right to social security as expressed in the International Covenant on Economic, Social and Cultural Rights [hereinafter "ICESCR"]. This right embraces "the right to access and maintain benefits, whether in cash or in kind, from (a) lack of work-related income." U.N. Comm. on Econ., Soc. & Cultural Rts., General Comment No. 19: The Right to Social Security, U.N. Doc. E/C.12/GC/19 (Feb. 4, 2008). Such benefits are explicitly contemplated within Kelso's capital-based income model via securities dividends and interest on bonds. Importantly, some international norms, while initially non-binding, become integrated over time into domestic jurisprudence. *See, e.g.,* Martha F. Davis, *Participation, Equality, and the Civil Right to Counsel: Lessons from Domestic and International Law*, 122 YALE L. J. 2260, 2281 (2013) (discussing the concept of "equality of arms," which was developed in international law and is now "inching its way into U.S. due process jurisprudence"); Neil A. Friedman, Comment, *A Human Rights Approach to the Labor Rights of Undocumented Workers*, 74 CALIF. L. REV. 1715, 1745 (1986):

> The process of infusing the many open-ended provisions of domestic law with positive meaning derived from the international law of human rights recommends itself as historically and technically sound, judicially palatable, and effective in gaining tangible benefits for undocumented workers and expanding the content of both constitutional law and customary international law.

122. *See* ICESCR, *infra* note 176; Rep. of the H.C. for Human Rights, at 17, U.N. Doc. E/2014/86 (July 11, 2014) ("The access to, use of and control over land directly affect the enjoyment of a wide range of human rights. At the same time, disputes over land are often the cause of human rights violations, conflicts and violence.") Ulrike Davy, *The Rise of the "Global Social": Origins and Transformations of Social Rights under UN Human Rights Law*, 3 INT'L J. SOC. QUALITY 41, 47-59 (2013) ("The United States accepted social rights because personal liberty required some form of economic security.").

123. Paul Arnell, *Extraterritorial Human Rights: A Tool for Poverty Reduction*, 38 COMP. & INT'L L. J. S. AFR. 396, 414 (2005) ("[T]he extraterritorial application of human rights is at present only a limited weapon in the war against poverty. It is limited in that it is generally reactive, only ever applying after action had occurred that led to or exacerbated poverty.")

domestic law.[124] Scholars continue to explore the ways in which international human rights law has brought about unforeseen consequences, [125] how it should be reimagined,[126] and its capacity to uphold egalitarian ideals.[127]

A. The Universality of Inclusive Capitalism vs. Conventional Exclusivity

The aspirations of international human rights are premised on universality of application: the benefits of international rights are to be bestowed on *all* people—with special consideration for vulnerable populations—and not limited to preferred groups based on discriminatory principles or practices.[128] However, as Professor Ashford has observed, the language of international human rights is frequently couched in the exclusionary logic of mainstream economics[129]— (1) the invisible hand, per capita growth logic of Adam Smith's classical economics based on labor

124. *E.g.,* Catherine Powell, *Dialogic Federalism: Constitutional Possibilities for Incorporation of Human Rights Law in the United States*, 150 U. PA. L. REV. 245, 295 (2001) ("[B]y cultivating the ability of state and local initiatives to serve as a vector for incorporation of human rights law, the U.S. government could develop a broader and deeper commitment to human rights.").

125. Moria Paz, *Between the Kingdom and the Desert Sun: Human Rights, Immigration, and Border Walls*, 34 BERKELEY J. INT'L L. 1, 7 (2016) ("And so, more human rights also means more exclusion.").

126. *See, e.g.,* Tony Evans, *International Human Rights Law as Power/Knowledge*, 27 HUM. RTS. Q. 1046, 1068 (2005) ("[T]he human rights regime must be understood as a discourse of both freedom and domination and cannot be understood as one or the other."); Ernst-Ulrich Petersmann, Editorial, *From the Hobbesian International Law of Coexistence to Modern Integration Law: The WTO Dispute Settlement System*, 1 J. INT'L ECON. L. 175, 176 (1998) ("The worldwide recognition of human rights as part of general and conventional international law implies that public international law, and its Hobbesian doctrines, need to be revisited from a human rights perspective.").

127. Margot E. Salomon, *Why Should It Matter That Others Have More? Poverty, Inequality, and the Potential of International Human Rights Law*, 37 REV. INT'L STUD., 2137, 2137, 2143 (2011) ("[P]ositive international human rights law can be applied beyond efforts at poverty alleviation to accommodate a doctrine of fair global distribution.").

128. Beyond universality and equal treatment under the law, there is scholarly support for the existence of an international right to *equality*—i.e. prohibition of discrimination—through such instruments as the Convention on the Rights of Persons with Disabilities (CRPD). Jarlath Clifford, *Equality*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL HUMAN RIGHTS LAW 420, 443 (Dinah Shelton ed., 2013) ("A right to equality aimed at addressing the position of the vulnerable and the disadvantaged benefits not only the individual as a right holder, but also broader society, by nurturing social harmony through seeking improvements in democratic institutions."). Clifford approximates this right to the definition given by the Declaration of Principles of Equality:

> The right to equality is the right of all human beings to be equal in dignity, to be treated with respect and consideration and to participate on an equal basis with others in any area of economic, social, political, cultural or civil life. All human beings are equal before the law and have the right to equal protection and benefit of the law.

Id. at 442.

129. Ashford Interview, *supra* note 18.

specialization,[130] (2) the efficiency maximization and full employment logic of neoclassical economics,[131] (3) the logic of neoclassical growth theorists,[132] and the fuller employment logic of J.M., Keynes[133] and the so-called Keynesians,[134] "all of which are employed in mainstream discourse separately or in combination to support and rationalize an exclusionary market approach to private property and capitalism that facilitates capital acquisition with the earnings of capital primarily for people in proportion to their existing wealth."[135]

The different instrumental perspectives reflected above evoke an important distinction in the binary economic analysis between "market rights" and "welfare rights."[136] A *market right* is a right to participate voluntarily with others in market exchanges for goods and services either through direct barter or through the medium of money or credit.[137] In a world of perfect efficiency—devoid of such considerations as transaction costs, frictions, uncompensated positive and negative externalities, conspiracies in restraint of competition, monopolistic profits, fraud, natural resource depletion, barriers to market participation, coercion, duress, and limits to perfect foresight—such voluntary exchanges through the exercise of market rights would seem to be just and wealth-enhancing to the participants and others in ways that promote fuller employment, per-capita growth, and an over-all enhanced societal standard of living.[138] Such market rights include rights to labor, contract, lend, borrow, invest, and acquire and earn from property. In each of these instances, the market participants bring to the market something representing past or potential production or other

130. ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 5-23 (Edwin Cannan ed. 1904) (1776).

131. *See generally* ALFRED MARSHALL, THE FUTURE OF THE WORKING CLASSES (A.C. Pigou ed., Macmillan 1925) (1873); LÉON WALRAS, ELEMENTS OF PURE ECONOMICS 399 (W. Jaffe trans. 1926, Allen & Unwin eds. 1954) (1874) (delineating the essential nature of scarcity in economics, "[a]ll things which form part of social wealth—land, personal faculties, capital goods proper and income goods of every kind—exist only in limited quantities").

132. *E.g.*, Robert Solow, *A Contribution to the Theory of Economic Growth*, 70 Q. J. ECON. 65 (1956); Robert E. Lucas, Jr., *Some International Evidence on Output-Inflation Tradeoffs*, 63 AM. ECON. REV. 326 (1973).

133. *See generally* JOHN MAYNARD KEYNES, THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY (1936).

134. *E.g.*, Paul A. Samuelson, *Parable and Realism in Capital Theory: The Surrogate Production Function*, 29 REV. ECON. STUD. 193 (1962).

135. Ashford Interview, *supra* note 18.

136. *See* ASHFORD & SHAKESPEARE, *supra* note 15, at 47-48, 344-46 (1999). The substance of the text includes insights that are beyond those found in the foregoing reference, but that have been provided in the Ashford Interview, *supra* note 18.

137. Ashford Interview, *supra* note 18.

138. *Id*.

benefit offered in voluntary exchange for other past or potential production or other benefit.[139]

In contrast, *welfare rights* (including the money for basic living expenses, medical care, subsidies for farms and other producers, and other benefits)[140] endow recipients on whom they have been bestowed rights to past or future production, without the requirement of any antecedent or future production or other benefit provided by the recipients in voluntary exchange for the benefits received by them.[141] Such welfare rights are sometimes justified as needed to render the recipients more productive in the future by eliminating social disadvantages and otherwise empowering them, and are sometimes justified purely on conscientious, charitable grounds as inherent in the right to life at a socially acceptable standard of living.[142] However justified, welfare rights are rights to receive from the market something without the condition of voluntary exchange and without specifying on whom is imposed the cost of producing that which is received.[143] In a vast array of literature, this receipt is called *redistribution*; and divergent views regarding the positive and normative effects of such redistributions provide the bases of the much of the disagreement manifest among the commentators on positive human rights.[144] In the context of such controversy, the principle of binary growth takes on special significance because "once it is widely understood by market participants, the resultant more broadly distributed earning capacity can be realized as market rights by way of wealth-enhancing voluntary exchange, without any redistribution, in ways that provide the benefits that welfare rights are legislated to provide."[145]

B. Individual Property Rights in International Law

"[I]n a free government, almost all other rights would become worthless if the government possessed power over the private fortune of every citizen."[146]

139. *Id*.
140. *See, e.g.*, Dandridge v. Williams, 397 U.S. 471 (1970) (addressing the legal limitations on welfare rights).
141. Ashford Interview, *supra* note 18.
142. *Id*.
143. *Id*.
144. *Id*.
145. *Id*.
146. Chicago, Burlington & Quincy R.R. v. Chicago, 166 U.S. 226, 236 (1897).

As in domestic law, individual property rights on the international stage are essential to the pursuit of prosperity.[147] This may be particularly apparent among small entrepreneurs in developing countries where legal recognition, recording, and credible enforcement of property rights are frequently insufficient.[148] In the international context, individual rights are largely defined by treaties.[149] For instance, the Organization of American States provides individual property protections in its American Declaration of the Rights and Duties of Man, giving all people the right "to own such private property as meets the essential needs of decent living and helps to maintain the dignity of the individual and of the home."[150] In addition, the International Covenant on Economic, Social, and Cultural Rights provides: "[a]ll peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit, and international law."[151]

Scholars have advanced arguments for strengthening and augmenting individual property rights in international law under the law of state sovereignty over natural resources.[152] Professor Fernando Tesón argues that natural resources do not belong to collective entities such as the people or the state, but to individuals.[153] When a state encroaches on those private parties' property rights through regulation, international law mandates full

147. *See, e.g.,* Fernando R. Tesón, *Revising International Law: A Liberal Account of Natural Resources*, 52 SAN DIEGO L. REV. 1123, 1148 (2015) ("Strong and secure property rights are more likely to alleviate world poverty than redistributive schemes that pay no heed to the importance of wealth creation. Property rights create wealth, and only by creating wealth can a rule on natural resources serve the needs of all persons in the globe.").

148. HERNANDO DE SOTO, THE MYSTERY OF CAPITAL: WHY CAPITALISM TRIUMPHS IN THE WEST AND FAILS EVERYWHERE ELSE (2000) 160-214.

149. *See, e.g.,* American Declaration of the Rights and Duties of Man, O.A.S. Official Rec., OEA/Ser.L/V./II.23, doc.21 rev.6, art. 23 (1948) [Hereinafter "ADRDM"]; G.A. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948).

150. *See* ADRDM, *supra* note 149.

151. G.A. Res. 2200A (XXI), at 49 (Dec. 16, 1966).

152. *See, e.g.,* Lindsey L. Wiersma, Note, *Indigenous Lands as Cultural Property: A New Approach to Indigenous Land Claims*, 54 DUKE L.J. 4, 1061, 1061 (2005) (arguing that "rights to lands and resources are property rights that are prerequisites for the physical and cultural survival of indigenous communities.") (quoting S. James Anaya & Robert A. Williams, Jr., *The Protection of Indigenous Peoples' Rights over Lands and Natural Resources Under the Inter-American Human Rights System*, 14 HARV. HUM. RTS. J. 33, 53 (2001)).

153. Tesón, *supra* note 147, at 1125 (advancing an individualist argument that the principle of Permanent Sovereignty over Natural Resources is unjust because it "fails to recognize the moral and economic importance of private property rights.").

and fair compensation.[154] Further, environmental regulation in the context of climate change may reshape traditional formulations of property rights.[155]

Property law "should protect liberty when and to the extent that the recognition of liberty promotes the common good."[156] However, on the surface at least, the conception of the public good in human rights literature overlooks the productiveness of capital. No existing treaties or international legal practices currently recognize, protect, or seek to broaden the binary competitive right to *acquire* property.[157] The right to "own" and "freely dispose" of property, *once acquired,* are certainly important human rights "but those post-acquisition property rights provide little substance and protection to the vast majority of people who own little or no property, and who face a systemic (but unnecessary) denial of practical access to competitive capital acquisition rights" by reason of widespread ignorance of the three fundamental principles of binary economics.[158]

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154. Barry Appleton, *Regulatory Takings: The International Law Perspective*, 11 N.Y.U. ENVTL. L.J. 35, 47 (2002) ("International law makes no distinction about the bona fide public policy purpose of a taking . . . but international law guarantees compensation. Customary international law details full and fair compensation. NAFTA details an explicit standard of compensation which is set at fair market value at the time of the taking."). However, economic regulation must reach a higher standard under international law to be considered a taking. George C. Christie, *What Constitutes A Taking of Property Under International Law?*, 38 BRIT. Y. B. INT'L L. 307, 330 (1962); Jon A. Stanley, Comment, *Keeping Big Brother out of Our Backyard: Regulatory Takings as Defined in International Law and Compared to American Fifth Amendment Jurisprudence*, 15 EMORY INT'L L. REV. 349, 350 (2001) ("[W]hile regulatory takings do exist in international law, they currently have a much higher threshold than their American counterparts."). A sovereign state can exercise eminent domain powers to regulate in such a way as to control economic activity up until the point it becomes a taking. Hassan Sedigh, *What Level of Host State Interference Amounts to a Taking under Contemporary International Law*, 2 J. WORLD INV. 631, 681-82 (2001) ("[T]he [not unqualified] right of a sovereign State to regulate and control economic and commercial activities in its territory is an accepted principle of international law.").

155. *See generally* Prudence E. Taylor, *From Environmental to Ecological Human Rights: A New Dynamic in International Law?*, 10 GEO. INT'L ENVTL. L. REV. 309, 311, 395 (1998) (examining the existence of "ecological rights" or the "right to a healthy environment" which "extends to duties of the international community to preserve the global environment" and concluding that as "traditional concepts of property begin to disappear, as the lines between private and public property begin to blur, problems of potential abuse of rights increase"); Michael G. Parisi, Comment, *Moving Toward Transparency? An Examination of Regulatory Takings in International Law*, 19 EMORY INT'L L. REV. 383, 425 (2005) ("[G]overnments will have the right to establish their own level of protection against risks of environmental harm without creating an obligation to compensate.").

156. Eric T. Freyfogle, *Property and Liberty*, 34 HAR. ENVTL. L. REV. 75, 117 (2010). *See also* Amnon Lehavi & Amir N. Licht, *BITs and Pieces of Property*, 36 YALE J. INT'L L. 115, 161 (2011) ("Imposing a one-size-fits-all property jurisprudence to illuminate the meaning of 'fair and equitable treatment' or of 'expropriation' for land, intellectual property, chattels, or shares would create prohibitive constraints on each one of the host countries . . . .").

157. *Cf.* Ashford, *Why Working but Poor?*, *supra* note 7, at 510-11; *See generally* ASHFORD & SHAKESPEARE, *supra* note 15.

158. Ashford Interview, *supra* note 18.

Significantly, the constitutions of Massachusetts[159] and Virginia[160] (two of the prime movers in America's Revolutionary War) explicitly protect not only the right to property (once acquired) but also the right to *acquire* property,[161] thereby reflecting the belief of Thomas Jefferson and many of America's founders that widespread *access* to property ownership is an essential requisite for the robust, independent, individual political participation needed for enduring, democratic self-governance.[162]

C. Right to Free and Meaningful Participation in Economic Development

The Declaration on the Right to Development articulates an international commitment to an inalienable human right entitling individuals to "participate in, contribute to, and enjoy" economic development.[163] While the justiciability of this right arguably relies on its interpretation as a "people's right" instead of an individual right, it could nevertheless create legally binding obligations.[164] Indeed, international economic development could be democratized and people-centered.[165] Such obligations could then impel legislatures to promote ownership broadening financing consistent with the protection of existing property rights. The following three provisions of the Declaration, in particular, suggest alignment with human rights principles underpinning a policy built on inclusive capitalism.

First, under Article 2.3, states have the "right and duty" to enact policies aimed at the "constant improvement" of the well-being of the "entire population and of all individuals," on the basis of their "active, free, and

159. MASS. CONST. art. CVI.

160. VA. CONST. art. 1.

161. For a detailed exploration of the philosophical, political, and legal roots of the right to capital acquisition, *see* Korff, *supra* note 80, at 424, 420-27 (noting, for instance, that at the time of the American Revolutionary War "political momentum clearly favored not only the rights and legal protections of property possession, but also acquisition of real property.").

162. *See generally* Ashford, *supra* note 8; Robert Ashford, *Milton Friedman's Capitalism and Freedom: A Binary Economic Critique*, 44 J. ECON. ISSUES 533, 537-38 (2010).

163. U.N. GAOR, 41st Sess., 97th plen. mtg. at 3, U.N. Doc A/RES/41/128 (Dec. 4, 1986) [hereinafter "U.N. GAOR"].

164. *Id.*; MAURIZIO RAGAZZI, THE CONCEPT OF INTERNATIONAL OBLIGATIONS *ERGA OMNES* 144-45 (Clarendon Press ed., 1997). *See also,* Noel G. Villaroman, *The Right to Development: Exploring the Legal Basis of a Supernorm*, 22 FLA. J. INT'L L. 299, 307, 332 (2010) (positing that the right to development is comprised of "several legally binding norms" whose "collective nature and inter-state dimension" make it capable of serving as grounds for redress).

165. James C. N. Paul, *The United Nations and the Creation of an International Law of Development*, 36 HARV. INT'L. L. J. 307, 312 (1995) (discussing the influence of the international law of development and noting that development "should be people-centered, sustainable, and primarily concerned with the welfare of the poor and powerless, and that the processes of development should be 'democratized' and sensitized to 'human rights.'").

meaningful participation in development" and in the "fair distribution of the benefits resulting therefrom."[166] Insofar as "development" entails "economic growth," Article 2.3 appears tailor-made for enacting the core principles of binary economics which address the economic fairness imperative of broad-based productive participation in the economy via capital ownership and acquisition. Second, the Declaration's preamble calls for states to establish a "new international economic order" and recognize the rights of people to have "full control over their natural wealth and resources."[167] Pursuant to the reasoning of binary economics, the concept of *wealth* and *resources,* when employed in production, are included within the definition of *capital*.

Third, under Article 8(2), states should encourage popular participation in "all spheres" as an "important factor in development" further affirming that "[a]ll human rights and fundamental freedoms are indivisible and interdependent," and that states should take measures to "eliminate obstacles to development."[168] It further urges states to take measures to "eliminate obstacles to development." In the context of binary economic reform, such obstacles may include the overconcentration of capital ownership, subsequent lags on consumer demand,[169] and overreliance on a conventional view of labor as the sole means of participation and development.[170] Seen through the lens of binary economics, these three principles suggest that a citizen's participation in the economy should be unimpeded by regulations, taxes, and other governmental policies.[171]

Although "economic development" almost invariably goes hand-in-hand with fuller employment and per-capita growth, the Declaration and related commentary reveal no explicit recognition that robust participation in "economic development" requires widely distributed participation not only by way of labor, but also by way of capital acquisition. To the same effect,

166. U.N. GAOR, *supra* note 163.

167. Villaroman, *supra* note 164, at 300.

168. U.N. GAOR, *supra* note 163.

169. *See* Hujsak *supra* note 70 and accompanying text; Skarstein *supra* note 70 and accompanying text; MICHAEL SPENCE, THE NEXT CONVERGENCE: THE FUTURE OF ECONOMIC GROWTH IN A MULTISPEED WORLD (Picador 2012) (discussing how the "abundance of underemployed labor in the world economy" delays "labor saving technology" and how this phenomenon will end "in the current century"); Adrien Auclert & Matthew Rognlie, *Inequality and Aggregate Demand* (Wash. Center Equitable Growth, Working Paper 2018) (modeling the connection between income inequality and output and noting "if inequality is caused by an increase in individual income risk, and monetary policy does not or cannot lower interest rates enough to offset it, then a large, long-lasting slump can ensue.")

170. *See supra* notes 129-35 and accompanying text.

171. "The most notable facilitative government action would be to eliminate the corporate tax on corporate income paid to the ownership-broadening trusts to enable them to repay the lender and to pay dividends to binary beneficiaries." Ashford, *Beyond Austerity*, *supra* note 11, at 202.

the numerous declarations regarding the right to earn a living by decent and freely chosen work,[172] reflect no understanding of the binary perspective that (1) there are two (i.e., binary) ways of working, participating in employment and production, earning a living, and achieving economic security (i.e., via labor and via property rights in capital),[173] (2) unless supplemented by the earnings of capital, the labor earnings of most people produce little more than subsistence,[174] and (3) sustainable fuller employment in the context of technological advance cannot be achieved without broadening the distribution of capital acquisition.[175]

D. Right to Productive Employment

Employment rights implicate deep humanitarian values and as such are recognized by several international agreements.[176] For example, the right to physical security is often inextricably linked to the soundness of state economies and opportunities for people to earn a living.[177] As Pauli Murray noted in 1945, "[a]n urgent prerequisite to the preservation of world peace is the attainment of economic security for the peoples of the earth."[178] In the aftermath of World War II, nations recognized that saving "succeeding generations from the scourge of war" required international measures to rectify economic conditions known to precipitate it.[179] "The broad over-all problem of security in our time is the right to employment, the interest which the individual has in obtaining a good livelihood . . . this interest is on a par with the right to existence itself."[180]

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172. U.N. Comm. on Econ., Soc. & Cultural Rts., General Comment No. 18: The Right to Work (Art. 6), E/C.12/GC/18 (Feb. 6, 2006).

173. *See generally* KELSO & KELSO, *supra* note 8.

174. *Id*. at 7 ("Labor produces subsistence at best. Capital can produce affluence.").

175. Ashford, *supra* note 8.

176. *Cf.* International Covenant on Economic, Social and Cultural Rights, Dec. 16, 1996, 993 U.N.T.S. 3 (entered into force Jan. 3, 1976) (recognizing "the right of everyone to the opportunity to gain his living by work which he freely chooses or accepts," and a right to subsistence by means of working or not) [hereinafter "ICESCR"]. *See, e.g.*, HENRY SHUE, BASIC RIGHTS: SUBSISTENCE, AFFLUENCE, AND U.S. FOREIGN POLICY 55 (2d ed. 1996).

177. *Cf.* U.N., INT'L. INSTRUMENTS RELATED TO THE PREVENTION AND SUPPRESSION OF INT'L. TERRORISM, at 356, U.N. Sales No. E.08.V. (2006) (affirming member states' commitment to "confront oppression, eradicate poverty, promote sustained economic growth, sustainable development, global prosperity, good governance, human rights for all and rule of law" in order to preserve peace). *See generally,* RICHARD HAASS, A WORLD IN DISARRAY: AMERICAN FOREIGN POLICY AND THE CRISIS OF THE OLD ORDER (Penguin Press 2017); GUY STANDING, THE PRECARIAT: THE NEW DANGEROUS CLASS (Bloomsbury Academic 2011).

178. Pauli Murray, *The Right to Equal Opportunity in Employment*, 33 CALIF. L. REV. 388, 431 (1945).

179. U.N. Charter pmbl.

180. Murray, *supra* note 178.

Despite the foundational nature of employment in international human rights law, no existing treaty or declaration reveals any recognition that full employment includes not only labor employment, but also *capital* employment and that fuller employment of labor and capital requires a broader distribution of capital acquisition. This omission makes inclusive capitalism based on binary economics a vital consideration in a time of disparities in capital income,[181] a growing divergence between labor productivity and real hourly compensation,[182] and a state of technology that threatens to put even more "downward pressure on wages and upward pressure on inequality."[183] Against this backdrop—and insofar as advocates of a right to work strive for the right to earn a livelihood—binary economics offers a clarified picture of the issue.

In 2005, The United Nations issued a General Comment on the "right to work."[184] The Comment articulated both general and specific legal obligations for States parties to the International Covenant on Economic, Social and Cultural Rights.[185] The Comment proclaims that the "right to work is essential for realizing other human rights and forms an inseparable and inherent part of human dignity."[186] Yet while international agreements like this one could theoretically provide a foundation for recognizing "economic oppression as a form of human rights violation that could justify protection of the economic refugee by the receiving country,"[187] no international consensus has arisen to develop the right to work into an enforceable rule.[188]

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181. Claudia Goldin & Lawrence F. Katz, *Long-Run Changes in the Wage Structure: Narrowing, Widening, Polarizing*, BROOKINGS PAPERS ON ECON. ACTIVITY, Fall 2007, at 135 (analyzing the widening of the U.S. wage structure and observing that "[e]ven though productivity growth surged again starting in the mid-1990s, the benefits of economic growth have been concentrated at the top end of the distribution. America has been 'growing apart.'"); FACUNDO ALVAREDO ET AL., WORLD INEQUALITY REPORT (2018) 17, 32, 84, 86-87 (showing:

> The vast majority of Americans have earned little capital income over the last century, with the bottom 90%...rarely receiving more than 10% of their income from capital before the 1970s…[Whereas] the top 10% income earners still derive over 40% of their incomes from capital in 2014; this figure was almost 60% or the top 1%, and 70% for the top 0.1% in 2014.)

182. Fleck, et al., *supra* note 3.

183. EXEC. OFFICE OF THE PRESIDENT, *supra* note 28, at 2.

184. U.N. Comm. on Econ., Soc. & Cultural Rts., General Comment No. 18: The Right to Work (Art. 6), E/C.12/GC/18 (Feb. 6, 2006).

185. *Id.*

186. *Id.* at 1.

187. Francis Gabor & John B. Rosenquest IV, *The Unsettled Status of Economic Refugees from the American and International Legal Perspectives - A Proposal for Recognition Under Existing International Law*, 41 TEX. INT'L L.J. 275, 275 (2006).

188. Jeremy Sarkin & Mark Koenig, *Developing the Right to Work: Intersecting and Dialoguing Human Rights and Economic Policy*, 33 HUM. RTS. Q. 1, 40 (2011) ("While the [International Labour Organization] and [the Committee on Economic, Social and Cultural Rights] have generated

More fundamentally, binary economists would categorize the U.N.'s espousal of the value of work as dysfunctionally unrealistic because it conceptually limits work to *labor work* and ignores the fact that *capital also does work*. If broadly acquired, the work done by capital can liberate people from toil and enable them better to fulfill their greater potential through labor markets, charitable work, and other virtuous endeavors both self-fulfilling and good for society. (Kelso traced this focus on labor to the Puritan production ethic wherein toil is elevated "from a practical necessity to a moral and social duty."[189]) To the binary economist, the General Comment reveals no understanding of the fact that in a private property economy, there are *two* ways of working and earning a living: by way of labor *and* by way of the ownership of productive, income-earning capital.[190] Thus, to better fulfill the goal and aspirations of the advocates of positive international rights, the right to work[191] should be more broadly and realistically conceived to include not only the right to work by labor (as work was done before humans began using tools) but also by way of capital (as work is done in technologically advanced, industrial economies). By expanding the right to work not only by labor but also by private capital ownership, the right to work better fulfills two important social purposes (1) fuller employment in the context of increasing technological advance and automation[192] and (2) the underlying purposes of the right to productive employment—the right to dignity and personal liberty.[193] This is because binary economics seeks to replace the goal of full labor employment with

international law on issues relating to the right to work, they do not have the institutional capacity and reach to initiate broad rights based campaigns like the United Nations.").

189. KELSO & KELSO, *supra* note 8, at 6. The binary economist's reframing of the value of human labor highlights two practical dimensions of Kelsonian economic reform which are beyond the scope of this Note: (1) an investigation into whether and to what degree capital return could meaningfully supplement wages lost to automation and (2) a thorough exploration of the non-wage benefits and cultural value of *work* including maintenance of ethical norms, achievement of personal fulfillment, and pursuit of a (spiritual) purpose beyond physical survival. For a discussion of technology and the alienation of labor, *see* Mokyr, at el., *supra* note 22, at 38-40; BERTRAND RUSSELL, IN PRAISE OF IDLENESS (1935). *See also* KELSO & HETTER, *supra* note 76, at 128 ("Full employment should continue to be the social ideal of the generally affluent society, but the definition of 'full employment' should change with advancing technology so that it comes increasingly to mean leisure work, and decreasingly subsistence work.").

190. KELSO & KELSO, *supra* note 8, at 6-8.

191. The right to work implies a right to subsistence—itself a condition precedent to a life of dignity.

192. KELSO & KELSO, *supra* note 8, at 6-8. In Kelsonian terms, full employment cannot achieve maximum economic productiveness in the absence of a viable capital estate since "technological change systematically eliminates labor input into the production process." KELSO & KELSO, *supra* note 8, at 6.

193. KELSO & KELSO, *supra* note 8, at 6-7.

the goal of full labor and capital employment—extending private ownership of capital to a greater proportion of non-capital-owning households.[194]

As James Albus observed, "the fundamental purpose of an economic system is not to create [labor] work but to create and distribute real wealth . . . Robots can create real wealth."[195] Income generated from a broader distribution of capital ownership, according to the theory, would diminish dependence on government welfare, enhance consumer demand, and increase individual freedom to pursue entrepreneurial endeavors. This could be achieved through proposals akin to replacing of the Employment Act of 1946 with the Kelsonian "The Full Production Act" as a means of promoting and protecting the right of citizens to produce the "economic goods and services necessary to provide themselves with individual economic wellbeing and security" through capital ownership.[196]

E. Right to Independence and Self-Development

The World Conference on Human Rights affirmed the right to development "as a universal and inalienable right and an integral part of fundamental human rights" in 1993.[197] This commitment proved transient and largely symbolic, spurring ongoing debate about its content and utility.[198] Among the moral grounds for a human right to individual independence are "considerations of personal survival and well-being, independence and self-respect, and self-development."[199]

The fundamental aim of binary economics mirrors the U.N. objective to foster living conditions conducive to a life of dignity.[200] *Human dignity—*

194. KELSO & HETTER, *supra* note 189 and accompanying text. *See also* KELSO & KELSO, *supra* note 8, at 6-8.

195. Albus, *Robots and The Economy*, *supra* note 58, at 42 (discussing the merits of distributed private ownership of stock in automated robotics and associated companies and personal ownership of individual robots as means of allocating increased profits generated by automated manufacturing). *See also* Freeman, *supra* note 58; Rotman, *supra* note 58.

196. LOUIS O. KELSO & PATRICIA HETTER, HOW TO TURN EIGHTY MILLION WORKERS INTO CAPITALISTS ON BORROWED MONEY 169, 172 (1967).

197. World Conference on Human Rights, *Vienna Declaration and Programme of Action*, ¶10, U.N. Doc. A/CONF.157/23 (June 25, 1993).

198. *See, e.g.,* Wouter Vandenhole, *The Human Right to Development as a Paradox*, 36 VERFASSUNG UND RECHT IN ÜBERSEE, LAW AND POLITICS IN AFRICA, ASIA AND LATIN AMERICA, 377, 377 n.3, 382, 403 (2003) (delineating human rights as "individual rights" that are "claims against the state" which are "interdependent and indivisible" and concluding that "no strong reasons exist for pleading for a human right to development.").

199. R. George Wright, *Toward A Federal Constitutional Right to Employment*, 38 SEATTLE U. L. REV. 63, 80-81 (2014).

200. *See, e.g.*, Preamble to U.N. Charter (declaring that the achievement of "social progress and better standards of life" is one of the four aims of the United Nations); U.N. Charter art. 55 (expressly referring to "development"); RAGAZZI, supra *note* 164, at 145 n.64 (explaining that while development

a highly contested concept underpinning a variety of decisions and judgments of international human rights bodies—mediates among varied legal traditions.[201] This places dignity "at the starting point of the international human rights enterprise" where it can subsequently introduce new interpretive content to treaty norms.[202] Binary economics focuses on securing individual ownership rights to reduce dependence on unreliable labor income and increase opportunities for personal autonomy.[203] With a supplemental capital-based income, a worker would be liberated to pursue business ventures or educational opportunities that could be commonly understood as promoting "self-development" and "independence."[204]

The argument may be extended into the realm of international intellectual property law to posit that technology must equitably benefit inventors and businesses, though not to the exclusion of humanity.[205] As Professor Sarah Joseph notes, Article 15(1)(c) of the ICESCR protects "the personal link between authors and their creations and between peoples, communities, or other groups and their collective cultural heritage, as well as their basic material interests which are necessary to enable authors to enjoy an adequate standard of living," whereas intellectual property rights "primarily protect business and corporate interests and investments."[206]

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may well include "'the increased availability of consumer goods and a heightened level of industry,' the 'core of the concept . . . centres around the dignity of every human being'"). With regards to "self-respect," democratization of capital is premised in fundamental notions of fairness and morality. Even in the absence of commonly-held religious values stressing fairness and compassion, utilitarian ethics have been advanced to support widespread capital ownership. *E.g.*, Richard Penny, *Incentives, Inequality, and Self-Respect*, 19 RES PUBLICA 335, 335 (2013) (determining that the presence of "unequalising incentives undermines . . . citizens' self-respect," and thus it is a social condition to be urgently avoided, as preservation of "self-respect" is at the core of any theory of justice).

201. Carozza, *supra* note 117, at 350-59.

202. *Id*. at 359.

203. *See* KELSO & HETTER, *supra* note 76, at 19-23, 141-43.

204. *Id*.

205. Human rights law protects intellectual property rights while noting that they are "of a temporary nature" and could be "revoked, licensed, or assigned to someone else" whereas human rights are "timeless expressions of fundamental entitlements of the human person." Sarah Joseph, *Trade and Investment Law*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL HUMAN RIGHTS LAW 850 (Dinah Shelton ed., 2013) quoting Comm. on Economic, Social and Cultural Rights, *General Comment No 17: The Right of Everyone to Benefit from the Protection of the Moral and Material Interests Resulting from Any Scientific, Literary or Artistic Production of Which He or She is the Author*, U.N. Doc E/C.12/GC/17 ¶ 2 (Jan. 12, 2006).

206. *Id.*

F. Norms on the Responsibilities of Transnational Corporations and other Business Enterprises

Transnational corporations (TNCs) wield enormous influence over the lives of the people through whom they operate.[207] Their role in creating sustainable economic growth in the states in which they conduct business is beyond question. In fact, private entities (including NGOs) are increasingly the authors and enforcers of international law.[208] Correspondingly, TNCs' obligations to abide by basic standards of human rights have historically eluded the reach of justiciable and enforceable international law and even scholarly framing of proper imposition of legal duties.[209] Instead, the obligation of TNCs to abide by human rights law has historically been grounded in moral considerations built into voluntarily applied corporate codes and international commercial agreements.[210] In many cases, victims of abuse attributable to corporations are practically powerless to redress violations.[211] Further, as Professor Joseph observes, current international economic legal regimes are theoretically but not always compatible with international human rights law.[212] Such regimes "essentially promote the rights of a privileged few, namely foreign traders and investors," which can add to "the already great capacity for powerful entities to override the interest of the powerless and marginalized."[213]

However, should it become widely understood by market participants, the principle of binary growth could provide corporations with a "potent,

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207. Paul Redmond, *Transnational Enterprise and Human Rights: Options for Standard Setting and Compliance*, 37 INT'L LAW. 69, 69 (2003):

> There has been a dramatic increase in both the scale and complexity of the human rights issues arising from the emergence of international production methods and economic globalization generally—not least because of the accompanying erosion of the effective authority of the state institutions to whom human rights norms are addressed and who are charged with their enforcement.

208. Paul B. Stephan, *Privatizing International Law*, 97 VA. L. REV. 1573, 1574-75 (2011) ("Today the production and enforcement of international law increasingly depends on private actors, not traditional political authorities.").

209. LEE MCCONNELL, EXTRACTING ACCOUNTABILITY FROM NON-STATE ACTORS IN INTERNATIONAL LAW: ASSESSING THE SCOPE FOR DIRECT REGULATION 1-3 (2017).

210. Denis G. Arnold, *Transnational Corporations and the Duty to Respect Basic Human Rights*, 20 BUS. ETHICS Q. 371, 371 (2010) ("[O]nly a moral account of the basic human rights duties of TNCs provides a sufficiently deep justification of the 'corporate responsibility to respect human rights . . . .'").

211. Jan M. Smits, *Enforcing Corporate Social Responsibility Codes Under Private Law: On the Disciplining Power of Legal Doctrine*, 24 IND. J. GLOBAL LEGAL STUD. 99, 99 (2017) ("[S]ocietal standards have not yet reached the stage where the average consumer who buys a product from a retailer can hold that retailer legally liable for violations of the norms incorporated in the code.").

212. Joseph, *supra* note 205, at 869.

213. *Id*.

wealth-enhancing, share-ownership broadening approach to corporate finance that closely aligns the corporate fiduciary responsibility of corporate wealth-maximization with the corporate social responsibility to a wide array of stakeholders."[214] This would reinforce concurrent developments in international trade. Specifically, corporate governance instruments have recently made corporate social responsibility (CSR) mandatory under certain circumstances.[215] TNCs frequently find it in their best interests to comply with human rights law[216] and have engaged in voluntary collaborations to avoid complicity in human rights violations.[217] For example, the Global Network Initiative provides a "comprehensive code of conduct and accountability mechanism."[218] Nevertheless, while various industry-specific[219] legal instruments have been proposed to deter TNCs from abusing human rights[220] and attach liability to transnational actors involved in inherently dangerous activities,[221] holding businesses liable as

214. Ashford Interview, *supra* note 18. *See also* Ashford, *Unutilized Productive Capacity*, *supra* note 16, at 49. Ashford, *Memo on Binary Economics*, *supra* note 75; Ashford, *Binary Economics, Fiduciary Duties*, *supra* note 75.

215. *See* Backer, *supra* note 66; Jan Eijsbouts, *Corporate Codes as Private Co-Regulatory Instruments in Corporate Governance and Responsibility and Their Enforcement*, 24 IND. J. GLOBAL LEGAL STUD. 181, 182 (2017) (noting that "adoption of a code as corporate governance and CSR instrument is for many companies no longer voluntary, and . . . the content of the code is no longer optional in many respects . . . the code's place in the corporate governance regulatory framework as one of the primary governance tools for the company."). *See also* Robert McCorquodale & Penelope Simons, *Responsibility beyond Borders: State Responsibility for Extraterritorial Violations by Corporations of International Human Rights Law*, 70 MOD. L. REV. 598, 598 (2007) ("[H]ome states of TNCs have obligations under international law in certain situations to regulate the extraterritorial activities of corporate nationals or the latter's foreign subsidiaries and can incur international responsibility where they fail to do so."); Justine Nolan & Luke Taylor, *Corporate Responsibility for Economic, Social and Cultural Rights: Rights in Search of a Remedy?*, 87 J. BUS. ETHICS 433, 433 (2009) (identifying a "respect-based framework" by which companies prevent infringement of human rights or face litigation).

216. David Weissbrodt & Muria Kruger, *Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights*, 97 AM. J. INT'L L. 901, 921-22 (2003) ("[C]ompliance with human rights standards enhances a company's bottom line.").

217. *See* Backer, *supra* note 66 and accompanying text.

218. Brian R. Israel, Note, *"Make Money without Doing Evil?" Caught Between Authoritarian Regulations in Emerging Markets and a Global Law of Human Rights, U.S. ICTs Face a Twofold Quandary*, 24 BERKELEY TECH. L.J. 617, 620 (2009).

219. Flora Saraiva Rebello Arduini, *Financial Institutions and the International Frameworks on Business and Human Rights: Challenges in Implementation Procedures*, 8 AMSTERDAM L.F. 23, 31-33 (2016) (outlining the obligations of the financial sector in upholding human rights).

220. Subhabrata Bobby Banerjee, *Governing the Global Corporation: A Critical Perspective,* 20 BUS. ETHICS Q. 265, 265 (2010) (proposing a "radical revisioning of democratic governance . . . to overcome the limits imposed by sovereignty").

221. L.F.E. Goldie, *Liability for Damage and the Progressive Development of International Law*, 14 INT'L & COMP. L.Q. 1189, 1264 (1965) (observing that "the ends of State power can be subordinated to the protection of the human individual.").

human rights abusers via treaty seems unlikely.[222] Because inclusive capitalism based on binary economics reveals a means by which consumer purchasing power may be expanded among the most economically marginalized members of society—thereby facilitating economic growth—human rights advocates might gain traction by shifting their focus to the financial incentives and fiduciary duties implicit in binary economics.[223]

CONCLUSION

AI is transforming the economies of every nation on the globe[224] in ways that are often disturbing and difficult to discern.[225] Insofar as it depresses wages, AI necessitates measures that will enable societies to adapt and thrive.[226] The magnitude of technological-economic change[227] may warrant relinquishing full *labor* employment as a policy objective in favor of a modernized social safety net[228] or other economic reforms based on long-

222. Pierre Thielbörger & Tobias Ackermann, *A Treaty on Enforcing Human Rights Against Business: Closing the Loophole or Getting Stuck in a Loop*, 24 IND. J. GLOBAL LEGAL STUD. 43, 77 (2017) (expressing skepticism about the prospects for a new legally binding treaty and uncertainty about how and by which bodies such a treaty would be enforced toward corporations).

223. *Cf.* Padfield, *supra* note 21 and accompanying text.

224. Purdy & Daugherty, *supra* note 46.

225. FRANK PASQUALE, THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION 218 (Harv. Univ. Press 2015) ("[O]ur black box society has become dangerously unstable, unfair, and unproductive. Neither New York quants nor California engineers can deliver a sound economy or a secure society. Those are the tasks of a citizenry, which can perform its job only as well as it understands the stakes.").

226. *See, e.g.,* Ford, *supra* note 47 and accompanying text; Ydstie, *supra* note 10. The formulation of such measures currently eludes much of mainstream advocacy and scholarship because automation now increasingly enables—even obligates—firms to withdraw from their historical role as the source of purpose, identity, and livelihood for their workers (i.e. the majority of the population of the industrialized world), thereby undermining the "fortress" of workers' rights law. Cynthia Estlund, *What Should We Do After Work? Automation, Fissuring, and the Law of Work*, 128 YALE L. J. 23-27, 42 (forthcoming 2018) (cited with the author's permission). Professor Cynthia Estlund, a leading scholar of labor and employment law and workplace governance, suggests that automation could precipitate the development of a new political economy. *Id.* at 51-52. Estlund observes that existing labor and employment law, which was originally intended to protect workers, may now perversely accelerate the shift to worker displacement. *Id.* at 40, 44-45. Estlund observes that labor and employment law acts as social entitlement which taxes firms' use of human labor, thereby increasing their motivation to substitute machines for human workers. *Id.* The rise of automation, she argues, will therefore compel those advocates and policymakers concerned with even *incrementally* reducing employers' incentives to automate to consider policy tools such as universal single-payer health care, earned income tax credits, universal basic income, or workers' equity ownership in technological capital. *Id*. at 48-50 citing Freeman, *supra* note 58.

227. *See* Schwab, *supra* note 35 and accompanying text.

228. David Macarov, *The Employment of New Ends: Planning for Permanent Unemployment*, 544 ANNALS AM. ACAD. POL. & SOC. SCI. 191, 202 (1996); Andrew McAfee & Erik Brynjolfsson, *Human Work in the Robotic Future: Policy for the Age of Automation*, 95 FOREIGN AFF. 139, 150 (2016) (arguing for deregulation, earned income tax credits, and policies that encourage people

standing, widely accepted conventional approaches to economics.[229] Based on principles of binary economics, this Note recommends a more inclusive capitalism premised on modernized understanding of economics and the nature of work.[230] This modernized binary understanding recognizes the rational prospect of fuller employment of labor and capital and of more broadly distributed, individual earning capacity that seemingly flows from broadening capital acquisition with the earnings of capital. In theory, the advance of AI and the human right to capital ownership could mutually co-arise.[231]

At the same time, international human rights law has broadened its scope of inquiry, obliging nation states and TNCs to recognize human rights to subsistence, dignity, and meaningful individual participation in economic development.[232] This has taken place in the context of a generation witnessing multiple recessions resulting in jobless recoveries,[233] increased concentration of capital ownership,[234] polarized debates between

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to work); Thomas K. Grose, *Replaced by Machines,* PRISM (Mar. 2017), http://www.asee-prism.org/replaced-by-machines/ (positing that AI will kill more jobs than it creates, giving rise to the need for retraining or universal basic income).

229. *E.g.*, Nicholas A. Ashford, Ralph P. Hall & Robert Ashford, *Addressing the Crisis in Employment and Consumer Demand: Reconciliation with Environmental and Financial Sustainability*, EURO. FIN. REV., Oct.-Nov. 2012, at 68; JOSEPH E. STIGLITZ, REWRITING THE RULES OF THE AMERICAN ECONOMY: AN AGENDA FOR GROWTH AND SHARED PROSPERITY 8-9 (2016); Jasmin Sethi, *Another Role for Securities Regulation: Expanding Investor Opportunity*, 16 FORDHAM J. CORP. & FIN. L. 783, 837 (2011) (positing that "securities regulation should also seek to expand opportunities for wealth accumulation, particularly for the majority of our society, which has a small proportion of our nation's wealth.").

230. Ashford, *Why Working but Poor?*, *supra* note 7.

231. Such a goal could be sought through consensus-building within the business community. *See* Barton, *supra* note 92. *See generally* James Meade, *Full Employment, New Technologies and the Distribution of Income*, 13 J. SOC. POL'Y 129-46 (1984); MARTIN L. WEITZMAN, THE SHARE ECONOMY: CONQUERING STAGFLATION (Harvard Univ. Press 1986); Albus, *Robots and The* Economy, *supra* note 58; Rotman, *supra* note 58; Freeman, *supra* note 58.

232. *See supra* Section III.

233. HENRY SIU & NIR JAIMOVICH, THIRD WAY NEXT, JOBLESS RECOVERIES 21 (2015):

> [O]ver the past 40 years, structural change within the labor market has revealed itself during downturns and recoveries. The arrival of robotics, computing, and information technology has allowed for a large-scale automation of routine tasks. This has meant that the elimination of middle-wage jobs during recessions has not been accompanied by the return of such jobs afterward. This is true of both blue-collar jobs, like those in production occupations, and white-collar jobs in office and administrative support occupations. Thus, the disappearance of job opportunities in routine occupations is leading to jobless recoveries.

234. "At the structural level, the current global crisis is above all one of overaccumulation, or the lack of outlets for the profitable absorption of surpluses." William I. Robinson, *"The Great Recession" of 2008 and the Continuing Crisis: A Global Capitalism Perspective*, 38 INT'L REV. MOD. SOC. 169, 176 (2012) (discussing a global crisis generated by hyper-accumulation of massive concentrations of transnational financial capital); Samuel Rosenberg, *Labor in the Contemporary Social Structure of Accumulation*, *in* CONTEMPORARY CAPITALISM AND ITS CRISES: SOCIAL STRUCTURE OF ACCUMULATION THEORY FOR THE 21ST CENTURY 195, 210-212 (Terrence McDonough, Michael Reich

proponents of austerity and stimulus,[235] civil anxiety,[236] and a widespread rejection of democratic governance in favor of authoritarianism.[237] At the intersection of these technological, political, and legal trends is binary economics—an increasingly prescient theory for (1) fuller employment of labor *and* capital spawned by more broadly acquired capital and thereby (2) more broadly distributed earnings and prosperity in the increasingly automated global economy.[238]

While complications inevitably arise around international efforts to collaboratively manage threats from changing technologies,[239] the international community has declared its intent to create opportunities for every person to earn a living:

> With a view to the creation of conditions of stability and well-being which are necessary for peaceful and friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, the [United Nations] shall promote: (a) higher standards of living, full employment, and conditions of economic and social progress and development.[240]

In a private property, market economy (with the exception of price-stabilizing, central bank monetization consistent with real economic growth) there are only three fundamental means to distribute the money and resources to support life and a socially acceptable minimum standard of living: (1) earnings from the work of labor, (2) earnings from the work of capital, and (3) redistributed earnings.[241] Observations about technological

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& David M. Kotz eds., 2010) (discussing "increased economic inequality and stagnant wages and benefits" in addition to "excessive consumer debt and asset bubbles" and "concentration of household income at the top of the income distribution" preceding the 2008 recession, all of which increase the likelihood of an emergence of new "social structure of accumulation").

235. Ashford, *Beyond Austerity*, *supra* note 11 at 179.

236. *E.g.,* WORLD ECONOMIC FORUM, GLOBAL RISKS REPORT 2016 26 (2016) ("[C]hronic and resurgent violence, conflicts, and economic and social volatility will remain prominent features of the current and future reality. The rising flows of people on the move as a result of greater insecurities represent only one of the symptoms of a deep-rooted and protracted systemic governance crisis . . . .").

237. Roberto Stefan Foa & Yascha Mounk, *The Danger of Deconsolidation: The Democratic Disconnect*, 27 J. DEMOCRACY 5, 7 (2016). *See also* Frederick Solt, *The Social Origins of Authoritarianism*, 65 POL. RES. Q. 703, 710 (2012) ("[W]here economic inequality is greater, authoritarianism is substantially more widespread among all citizens, regardless of their incomes.").

238. Stumpff, *supra* note 86 at 429, 431.

239. Shira Pridan-Frank, *Human-Genomics: A Challenge to the Rules of the Game of International Law*, 40 COLUM. J. TRANSNAT'L L. 619, 674 (2002) ("[I]nternational concerns are being addressed in a decentralized-specialized manner . . . .").

240. U.N. Conference of International Organization, *Suggested Rearrangement of Chapter IX*, ¶1, U.N. 10 Doc. Conf. on Int'l. Org. (June 4, 1945).

241. Ashford Interview, *supra* note 18.

change and concentration of ownership have indicated that these aspirations may be impossible to achieve with an undercapitalized global population without either broadening capital ownership or increasing income redistribution. A major element of the resistance to enhancing the share of national wealth distributed to the "have nots" comes from the "haves" and some "would-be haves" in the form of resistance to redistribution (whether of income or capital ownership); and this resistance is fortified by the internationally recognized protection of property rights (particularly a major concern of the "haves").[242]

The theory of binary economics addresses the heart of this issue in its assertion that without redistribution of capital ownership, capital, or labor income, a voluntary broadening of capital acquisition with the earnings of capital will simultaneously promote fuller employment of labor and capital and enhance widespread individual earning capacity and therefore sustainable and long-term consumer demand.[243] As demonstrated by the success of many ESOPs, firms may take steps to self-regulate through the promotion of multilateral agreements enforceable in national courts. To the extent that a broadening distribution of wealth created by capital and AI can be shown to enhance the stability of the very enterprises that gave rise to them, the binary approach to a more inclusive capitalism may be used to incentivize non-redistributive, wealth-enhancing industrial cooperation among governments, NGOs, private firms, charitable and religious institutions, and individuals.[244]

As was declared in another tumultuous period, "[t]he test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little."[245] By progressing in such a way, societies worldwide may be able to realize the vision of technological advances that will reduce the demand for labor, fulfill basic needs, and allow workers to focus on "how to occupy the leisure, which

242. *Id*.

243. Ashford Interview, *supra* note 18. The notion of demand-preservation vis-à-vis ownership expansion may also be framed as a defensive measure to mitigate a potential public backlash against perceived intrusions into fundamental rights, including those articulated in Art. 25 of the International Declaration of Human Rights. *See* Ashford, *Milton Friedman's Capitalism and Freedom*, *supra* note 162 ("W]idespread reaction against Benthamite liberalism reflected a concern regarding the increased concentration in economic and political power in *private* hands and the stifling effect it had on economic and political freedoms of the vast majority of society.") (emphasis in original).

244. Ashford Interview, *supra* note 18.

245. President Franklin Delano Roosevelt, Second Inaugural Address (Jan. 20, 1937).

science and compound interest will have won for him, to live wisely and agreeably and well."[246]

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246. *Cf.* JOHN MAYNARD KEYNES, ESSAYS IN PERSUASION 367 (W. W. Norton & Co. 1963). *See also* JOHN STUART MILL, *Of the Stationary State, in* PRINCIPLES OF POLITICAL ECONOMY WITH SOME OF THEIR APPLICATIONS TO SOCIAL PHILOSOPHY Book VI, Chapter VI, 6.9 (William J Ashley, ed. 1909) (asserting that "human improvement" includes all kinds of "mental culture, and moral and social progress; as much room for improving the Art of Living, and much more likelihood of its being improved, when minds ceased to be engrossed by the art of getting on," and pointing out that "all the mechanical inventions yet made . . . have not yet begun to effect those great changes in human destiny, which it is in their nature and in their futurity to accomplish"). Further, Mill contemplates automation technology becoming "the common property of the species, and the means of improving and elevating the universal lot." *Id*.

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