The Importance of Understanding Society in Shaping Fair Economic Systems with AI

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Abstract: Remarkable global advances in science and technology have fueled rapid economic growth. The systems and technologies for emerging paradigms, like artificial intelligence and machine learning, have the potential to be catalysts in transformations of economic structures. It is crucial that such transformations are fair, and the importance of understanding social and cultural aspects in their realization is a growing focus. This essay aims to explore and resolve the interplay among artificial intelligence, society, and the formulation of equitable economic structures.

Keywords: AI, economic systems, fair

1. Introduction

Technological advancements have opened discussions surrounding the emergence of entirely new paradigms of operation, like Industry 4.0 and the application of artificial intelligence in all economic sectors, that is deeply integrating with economic organizational systems. However, the creation of fair frameworks from a completely technological standpoint is proven particularly difficult at present (Zajko, 2020). Furthermore, societal aspects have long been ignored by many pursued innovations and implementations. Particularly, the “black-box” nature of state-of-the-art AI models prevents insights into why determinations are made and these advanced models are especially more opaque than simple models. It can result in the creation of more uncertain economic structures for some sectors, thus designing artificial intelligence models with much more rigorous fairness constraints as well as methods for interpreting the inner workings of such models should be researched. The critical theme to be developed is to use the understanding obtained in society and sociocultural dynamics, so as to propose a wide range of concepts and new technological approaches in the formulation of economic structures, a system that learnedly consider and integrate societal dynamics. Designed approaches range from relatively simple models that can be applied immediately and models capable of having a real societal impact on fair practices in economy by their adoption in large-scale decisions. Potential use-cases and societal behaviour changes are analyzed in such cases. Throughout all these considerations, it is intended to show that the consideration of understanding society and socio-cultural dynamics is of great importance and worthy of further study in creating fairer and more beneficial economic structures. This introduction is closed by summing up the societal aspects to be discussed and an outline of the rest of the essay.

1.1. Background and Rationale

AI is quickly changing global economic systems. As AI technology becomes more sophisticated, it is expected to disrupt economies to an unprecedented extent (Zajko, 2020). Much written about the economic impacts of AI has focused on global processes, technological progress, and competition between countries. Meanwhile, the social aspects of economic change are often overlooked, as this requires specialised knowledge of sociology or anthropology. This has meant that many of the inequalities posed by existing economic systems have been replicated and reinforced by the rollout of AI technology. As the world enters a new era of AI-driven economic growth, it is imperative to consider what a fair, inclusive economic system could look like. A multidisciplinary approach is necessary to answer this question effectively, drawing insights from sociology and anthropology, and this from the genesis of AI innovation.

Economic theory is considered by many as excessive, often wilfully so, and based on overly-reductionist modelling. Mainstream economic theory deals with markets and mathematical models, developed largely in the Western world, which was abstracted from social processes, in the process overlooking many non-market distributions of wealth, excessive economic power, cultural factors affecting economics decision-making, social mobility and a multiplicity of other sociological and anthropological phenomena. In recent years however, there has been a movement away from these traditional methods of investigation. Current economic developments have seen a confluence of subjects not typically associated with economics, with historical procedures, ethnographic accounts and sociological reports used as sources on an economy. Experimentation also becomes commonplace; for instance, it is now common for quantitative laboratory trials of the economic effects of psychological interventions to be carried out. However, it is argued that a more integrated approach is still needed for mainstream economic theory to elucidate a more complex and nuanced worldview. To prefigure the AI-dominated economic systems of the future, the multi-faceted nature of economics must be understood.

2. Foundations of Economic Systems

Understanding Economic Systems As the foundation of societal organization, economic systems usually carry a set of established rules designed to govern resource allocation and distribution among a collective of individuals. Broadly, these systems all attempt to balance resources (defined herein as the net summation of productive assets, operational material, and labor capability among all economic participants in a given setting) across various channels of the society on the basis of market forces, governmental interference, or a combination of both (Marwala and Hurwitz, 2017). The ways these subsystems distribute these resources then lead to the cumulative well-being of a population. Recognizing the economic systems of a society at large, therefore, is central to understanding the problems of resource inequality or systemic distortion. Accordingly, as

with many disciplines of social science, economists have developed various theoretical underpinnings to conceptualize and explain these systems. A basic understanding of these models is crucial to the interpretation of sociopolitical processes in a given country, city, or institution according to the visitor’s own professional outlook and practical outlook. Security experts working for or targeting a given system are placed in a particularly crucial position, as open conflicts over economic systems are common elements of national, communal, or political confrontation worldwide.

The Foundation of Economic Systems Models of economic systems quantify how participant economies allocate and distribute the many resources fulfilled by them. Each model is a gross oversimplification of the real world, of course, capable of little more than general direction guideline for a foresight into societal resource distribution. In practice, these models are frequently blended, compared, and adapted to country-specific or industry-specific understandings of a state's affiliated economic systems; as such, a nation’s department of economy or a consultancy would typically maintain dozens of such deeply customized models. Still, these proposed models introduce the many economic distribution configuration possible, fraught, or hypothesized for a subnation regarding nation-state actor. To answer why a state or industry offices the economic decisions he or she suggests or criticizes, it is therefore best to begin by considering the inherent differences among the many economic systems of countries and territories and the many normative configurations useful to specialized economic sectors. Better than anything else, these very broad models represent the starting point for the interpretation of economic system configurations. In support of these explanations, this write-up is intended to outline how these understanding rules function and introduce the various resource distribution processes to which economists frequently argue or take objection.

Supply and Demand The interaction of supply and demand is the underlying principle of all economic models. In classic theory, market prices adjust to clear excesses in supply or demand alike. For instance, in models of free markets (markets without effective interference), if buyers compete for a good or service at a greater rate than sellers vying to furnish that service, the price of the good will be bid up; similarly, if less-than anticipated demand for a specific service arises, providers cease producing it, and the price this service fetches will, in time, diminish. Overly simplified models assume instant repositioning of products and resources between the many economic participants considered in the system. Thus, while some models assume any excess supply in a country will eventually find its way to demand, or vice versa, in any trade, this is an exceedingly slow process and difficult, nonetheless, to implement nationwide in every instance of a desire market outcome. Markets may resist tendencies toward equilibrium, and many traditional models stress the importance of conflict between buyers and sellers in the structure of wealth and societal position. Combined with hi-tech investment, modern technologies similarly mean that marginalized groups may face systemic denial

of any market; for example, in conflicts with interstate structures over labor protections or safety regulations, economically powerful parties shielded by the diagramming of a system might be more willing to adapt more enhanced worker and environmental safeguards.

How Economic Systems Work The manner in which a society indulges production significantly evolves trade patterns, governing structures, and social contract. As such, it is interesting to consider economic systems through shifting time frames. Understanding among Western economic thought over the past century has developed correspondingly. Broadly, classical models portended that trade could be financed by externally-driven profitability and growth; this thinking culminated in the so-called “Ricardo Doctrine” in support of free trade. By contrast, until the outbreak of the First World War, most influential economic thinkers, led by Friedrich List in the United States, coalesced around the claim that free trade would subordinate industrial development for agrarian society. Industrialization, they argued, should therefore be promoted by fostering emerging businesses through protective tariffs. This tension echoed political divisions and financial problems across the emerging Western world. Amply free-trade policies became a focus in Britain and France, belief in abundant raw materials and worldwide markets favoring industrial production, while most of Europe and the United States adopted tariffs and actively funded infrastructure projects to boost sales of goods to their population. Broadly recognizing the economic success of those that chose to immune their markets gave rise to trade agreements limiting national economic policy difference within free-trade zones.

Broadly, a cultural ecosystem is a society treated as a system of adaptive complex interdependent networks. These networks consist of subsystems or agents that affect one another by dynamically adapting to one another (Chatterjee, 2017). The axes of adaptation are the informational (knowledge or skills) and the material axes (money, property, equipment, etc.). There are interdependencies that are utilization based—subsystems provide products that other subsystems exploit to provide their products or services—and other types of interdependencies that correspond to politics or the power relations between subsystems. This system generates a social knowledge that is generated by the processes of adapting to the other subsystems and provides significant emergent outcomes. This social knowledge allows a society (or a country) to have capabilities—i.e. competences, capacities, organizations—that are structural in the sense indicated by Ing. This system, furthermore, affects the informational and material conditions of the component agents/subsystems. Broadly, a cultural ecosystem is a society treated as a system of adaptive complex interdependent networks. These networks consist of subsystems or agents that affect one another by dynamically adapting to one another. The axes of adaptation are the informational (knowledge or skills) and the material axes (money, property, equipment, etc.). There are of course networks of interdependencies that are utilization based (subsystems provide products that other subsystems exploit to

provide their products or services). But as is well known there are also other kinds of interdependencies that correspond to politics, power relations. So we have a system of interdependent networks that generates a social knowledge—that is, a knowledge that is generated by the processes of adapting to the other subsystems—and that provides significant emergent outcomes.

3. Artificial Intelligence in Economics

3.1 Introduction Artificial intelligence (AI) is expected to profoundly affect economic systems, and the estimation of its anticipated effects and implications is critical. This section seeks to provide an overview of the transformative role of AI in the framework of economics to foster a better understanding of the potential and limitations of AI. AI technologies play a decisive role in optimizing decision-making mechanisms through learning algorithms and the processing of big data, which achieves efficiencies and/or accuracies that were previously unattainable (ABRARDI et al., 2019). AI is sought to enable industries to outperform traditional markets by predicting trends and making economic decisions, which open up new dimensions in various fields of economics, such as data evaluation, consumer behavior analysis, and improved risk assessment. Hence, grasping the capabilities of the AI aids in evaluating how AI is reshaping economic environments properly. Although the notion of "hot" AI alludes positive characteristics, the understanding that not all good can guarantee good outcomes is crucial, as well. The quality of data and transparency of algorithms are important devices for this purpose but are usually disregarded due to the complexity of the underlying models. This often leads to malicious use, unfair decision-making, and formation of biased results in various sectors. Also, the impact of handling big data on privacy is noteworthy. Numerous ethical concerns accompany AI in economic implementation in the hacked data from a private company's competitors, resulting in unfair market conditions. Accurate distributed data is shattered in terms of privacy. Cleaning and merging processes can have poor outputs, especially with a few large datasets. Importing foreign data might result in data with a different meaning, redundant information, or flaws. Centralized datasets can be fund-biased. An AI surrogate could be tricked into producing a wrong output, often rendering biased decisions.

3.1. Applications and Impacts

Within the span of a decade, intelligent materials for fuel-saving car tires, ever more efficient smartphones or flat screens, and artificial intelligence systems for optimal control in industrial processes, robots, search engines, or image and speech processing have been developed successfully. With the swift, evident maturation of intelligent systems comes the ongoing scientific querying of the societal consequences of intelligent systems. Systematic analyses are conducted within the framework of a project, based on an AI model of economic markets. The results are meant to be a general framework of

both the benefits and eventual dangers posed by intelligent systems in economy and society.

AI technologies are showing a capability for being applied in economic contexts as well, and markets are cleared via economic exchange. Both in simulation studies and discussions with economic experts, the claim is substantiated that, as time goes by, intelligent systems are going to be integrated deeply in sophisticated markets, besides existing electronic stock exchanges. The examination of some possible applications of intelligent agents or robots in operating economic markets is starting to have a practical understanding of the admissible applications of AI in an economic environment. This, in turn, is meant to trigger off series of experiments understood to divulge some elementary laws governing the interplay of multi-agent systems and the shaping of market behavior in general. The research aims at being particularly informative about the commercial use of AI on both financial and commodity markets. A concise introduction to the inner structures of existing electronic stock exchanges is appended, along with an outlook on their prospective development, not only due to the introduction of automated trading systems but also in light of continually growing volumes of international trade.

4. The Intersection of Society and Economics

In thinking about the economic systems in which people live – or are trying to create through the development of AI – it is in some sense critical to also think about and engage with the broader societal structures with which those economic systems intersect (Zajko, 2020). This perhaps might seem like an over-elaboration of the obvious, after all it might be thought that economic systems happen within society and hence unavoidably always have a societal context. Yet the economic as a field of study, and as a series of political paradigms and policy structures used by governments, nonetheless often treat the economic as a separate phenomenon and set of policies to the social more generally. Certainly, if societies and economies alter such that they are about to be re-created or upended through the introduction of new technologies such as AI; an opportunity of great potential and possibility, but also profound risk. An alteration of something so deep regarding the core organization of society and its norms might still be realized with little engagement with the communal implications of how that alteration will intersect socially.

Thinking about these societal-economic interworks implies recognizing the ways in which social norms and values may be absolutely crucial drivers of economic behavior and policy, how certain social institutions might deeply shape or even realize unique structures of economy, including the AI-focused, and the view that some of the primary challenges and hurdles relate more to societal than necessarily ‘economic’ features. Even as the economic might remain the dominantly understood framework for considering access, participation, and distribution, often issues of access to resources and capacities necessary for economic means and enrichment are in more profound ways social, given that social networks and the social capital represent a crucial form of enabling

engagement in a multitude of economic or commercial activities. To note such matters, and so to take them into consideration in developing research and theory broadly adhering to or working within economic frameworks becomes not just useful, but necessarily de-rigueur and meaningful. The basis of these claims as to necessity and meaningfulness is from understanding such a response as fostering not just interdisciplinary discussion, but also a more inclusive and coherent understanding of economics, whereby issues which have long been thought of as implicit to social and community values could also be properly considered as part and parcel of economic 'theory' as it is commonly imagined.

There are however means through which this nexus might be understood to a better degree; there is an established and rich body of sociological work on the intersection between society and economic systems. Moreover, an understanding of this intersection and the implications that it bears for economic or commercial activities is not solely fixed, invariant, and easily 'inherited' from the historical societal-economic structures in a given area but might by intentional could as it has in numerous cases in the last few decades. Taking this later view points sets up an explicit push for change in the means in which society is thought to intersect with the economic. Starting with a more generic discussion of theory and society linked, research push then goes on to show how the theory within which research takes place might be altered, influenced by the work of certain thinkers and perverse trends and care on the way in which economic structures and policies intersect with overarching societal structures, norms and values and are in turn cross-influenced by changes in these broader societal structures, norms and values, with a number of real-world examples then offered in such setups and finally a possible and exploratory application of these placed ideas and understandings to a very different societal arrangement, namely 'culture', and again shows real-world cases whereby cultural changes have led to inherent economic change.

4.1. Social Factors Influencing Economic Systems

A historical approach to Economic Systems would highlight the shifts in the economic structure of society and the transformation of who benefits from it. Yet despite enormous changes in technology, shared cultural attitudes as a society and deeply ingrained moral values can endure for hundreds of years. The wage gap between academics and manual laborers in Ancient Greece or during the Industrial Revolution seemed to be accepted as natural. With current population growth and wealth concentration, it seems prudent to rethink what is considered fair as consensus might be irreversible for the next few centuries. Fair does not equal equal. Ancient Greece had a reputation for democracy and freedom, yet only 5,000 out of 200,000 inhabitants in Athens could vote, whereas women, children and slaves were merely belongings. A similar scenario unfolded in the 19th century United States, praised for liberty by its historians while the disregard for Native and Black lives on its soil was catastrophic. Fairness would exist only if all

aspects were intelligible and participants truly equal. Amongst the various types of fairness theories that can be found, Atkinson's equality of political voice and economic reward seem simplest. Under this concept, all members of society have a voice and consequent power over economic matters. There is built in handicap for risk takers - a poorer musician will get less … but there is an implication of "paying" for being part of society.

Having reached a societal consensus about what is fair, Economic Systems can be built and optimized against this backdrop aiming to improve other scores such as GDP or GINI. The 2022 United States, for example, could decide for a more balanced reward distribution and adjust tax policies or regulations accordingly - reward speculation and inheritances less (Bohdal et al., 2023). Speed and scale of monetary fluctuations on the stock exchanges would be ramped down, and investments in sectors of societal value such as childcare or solar energy promoted. These policies would then allow one to find the questions most relevant for locally fair models. Both proposed policies and their immediate economic consequence can be discussed openly and the necessary adjustments made in the Economic System procedure. Being able to give reasons behind decisions could have transformative potential, otherwise deep-rooted prejudices, such as racial or cultural bias unsuited for the economic score alone, can be hidden in the network optimization.

5. Challenges and Opportunities in Designing Fair AI Systems

Underlying the potential benefits of AI that are often highlighted, important challenges and risks emerge for societies, governments, and the economy. It is critically important that investment and initiatives address these concomitant disruptions in the policy environment, otherwise, Industrial Revolution 4.0 may increase social inequality, particularly in countries unprepared for this change. It is in this context that this Special Section of papers identifies and researches the long-term consequences of the spread of AI systems that are less developed. This paper opens up discussion about the fair treatment of AI and its long-term consequences on society, economies, and governments. Regardless of industries, there are significant changes foreseen whereby management of data collaboration will require shared, reliable, and high-quality data as well as shared open networks (Bohdal et al., 2023).

While there is growing focus on investment in AI as an innovation engine, institutions are gradually moving on frameworks and strategies on the deployment and governance of inspection mechanisms, often with unconventional consequences. The question arises whether future AI would introduce a social divide, as it will magnify the digital gap between AI “haves” and “have-nots”, and what its impact on work, economy, and governments could be. Nevertheless, even for societies of AI aware countries, the broader implications of AI greater spread still remain somewhat underrated, and in this respect,

qualitative insights have been so far mostly absent from mainstream policy research in AI (Zajko, 2020).

5.1. Ethical Considerations

The importance of understanding how society shapes and is shaped by economic forces has been recognized since the early days of economic analysis. Economic actors have always been enmeshed in complex social structures of benefits and obligations, norms and power relations, cultural values and institutions. It is thus desirable that artificial intelligence (AI) systems be harnessed to support fair economic systems that serve human welfare comprehensively, consistent with the observance of ethical principles arising from a comprehensive, socially and historically informed understanding of society. Among those involved at any level of decision-making, economic reasoning is rarely the sole consideration. There is an understanding of society in the background, shaped by different disciplines, individual observations or shared beliefs. This mutual influence of society and economy means AI-economic systems are entwined with broader social aims, requiring an integrative approach allowing technology to be shaped by ethical, legal and social facets.

Ethical considerations must cover technological design and deployment, the organizational context, the broader social and regulative environment, and the conceptions of society from which the economic they are based on. It is broadly agreed that AI systems, as automating decision-making agents, involve a new dimension to previous widespread automation. The far-reaching consequences extend the possibility of failing to consider all required information, imposing the most efficient decisions, and neglecting the overall impact on a community. Fairness should encompass the belief that each individual interest should be equally addressed, the same as are in similar circumstances, pursuing social equality, redistributive justice, or ensuring freedom of competition. These four dimensions correspond either with deontological ethics, or with utilitarian approaches to welfare that do not neglect a politically desirable equity in bargaining power or wealth. The capacity to respect the data protection rights of data subjects in a context of inquiry or transfer might be regarded as an overriding ethical duty, as it upholds the righteous treatment of individuals (Giralt Hernández, 2024). Analogously, subjecting individuals or communities to general economic laws neglecting their cultural differences, historical frictions, individual endowments or degrees of freedom combines with mechanized perusal, as to exacerbate discrimination and disenfranchisement. Nor is it acceptable that stringent determinisms overrule the pertinence of complaints or claims, or curb the ability to counteract a predictable, or perennial predicament.

6. Case Studies and Best Practices

Despite the increasing implementation of Artificial Intelligence (AI) in economic systems, only limited attention has been paid to understanding, values, and policies in

society shaping fair and ethical AI-based economies. To be conscientious, trustworthy, and transparent with digital tools in a just economy, it is necessary to acquire a profound understanding of how AI interacts with society and cultural value systems. Case studies will be provided here, showing the impact of society and cultural values on successful AI implementations within economic frameworks such as banking, healthcare, industry, robotics, and electricity. The general public, communities, industries, countries, and stakeholders alike must learn to interactively control and manage AI systems and cooperate in defining values and policies for socio-cultural, fair, transparent, open, just, and ethical economic AI for a good society with a pleasant life-footing. By obtaining insights from these cases, it will be more capable of imagining best practices for successful and fair AI in economics. Questions will be encouraged to consider the replicability and the need to adapt and innovate continuously in a fast-changing technological context to the models described below, which were originally implemented in the field of robotics and AI applied to intelligent transportation systems.

6.1. Successful Implementations

This section introduces a forthcoming book that aims to address the question of how AI can create fair economic systems and how understanding society can shape this process. AI is rapidly transforming economies. From big data to machine learning, from the Internet of Things to blockchain, from computer vision to natural language processing, radical advancements in AI technology are impacting the way that goods and services are produced, exchanged, and consumed. However, such vast and sudden societal changes mean that discussions of AI often focus on its application areas or on specific social outcomes. By comparison, understanding the very society in which these systems are or could be operating has rarely been a concern when considering the implementation of AI in economic systems. This is a surprising absence. There is a vast accumulation of social theoretical knowledge about the types of social structures and dynamics on which specific AI systems are supposed to operate. AI, even in its least disenchanted form, is ultimately intended to mediate our understanding of and intervention in an external world shaped by these structures and dynamics. Without an understanding of the social environment in which AI is embedded, systems risk not performing as intended—or indeed, as desired. Which economic systems are considered ‘fair’ by AI? How does society understand what ‘fairness’ is, and how does this shape the creation and design of AI systems? The aim is to focus on the relationship between AI and societal understanding—to explore how the machines used to produce, distribute and exchange goods and services interact with, are shaped and directed by, familiar social theorization. First, however, some background observation about how AI impacts societal and economic systems.

7. Future Directions and Recommendations

This study surveyed a research roadmap on the potential benefits of AI and machine learning systems in economic systems, while designing, developing or adapting such systems for societal fairness. It identified the following general, broader research directions: 1. Describe general types of research involving AI research with economic systems that could enhance societal welfare. 2. Present a set of recommendations for researchers in AI, for researchers in the specific discipline of social forward-backward ties to the use of AI in economic systems, and for policymakers and practitioners working at the intersection of AI research and economic systems. It provides a roadmap for policymakers to invest in or support the development of more robust techniques to ensure fair AI systems, and for practitioners to gain a better understanding of the potential effects of AI systems in a way that better protects societal interests, as well as a list of interdisciplinary research questions at the intersection of AI and economic systems that could enhance societal welfare, with the goal of encouraging an interdisciplinary group of researchers, policymakers, and practitioners to emphasize high-interest projects. This list is meant to spark conversation and collaboration across different sectors, questions, and methods, and at the same time shows the importance of strategies to develop machine learning systems, a wider range of actors involved in economic processes. It is necessary to continuously evaluate and adapt these machine learning systems to ensure they continue to promote societal welfare. At the most general level, however, it is not easy to paint this vision and strategies required are very specific in potentially determine if it enhances societal welfare. This is the perspective taken here, presented in hopes of both inspiring innovative, effective, research directions and supporting public dialogue and advocacy to ensure that machine learning research with economic systems is equitably and sustainably developed in the future.

7.1. Policy Implications

The use of AI technology in the decision-making processes underlying economic systems raises a new set of considerations for policymakers. The advantages are numerous – from increased efficiency of economic operations and reduced informational asymmetries to the capacity to leverage big data for better economic decisions. Yet the integration of AI into economic systems also comes with ethical and social implications, such as the need to ensure their fair treatment of all stakeholders. It is argued that it is vital to integrate understanding of society directly in the design of new economic systems to guarantee both ethical and fair structures and that this in turn has important normative implications for the design of AI-driven economic systems. The recent social dilemmas experiment on Facebook has shown how AI-driven systems can create systemic inequalities (Bohdal et al., 2023). To exploit this technology for good and prevent harm, society must consider the design and fairness of such economic systems. In this respect, there are several important considerations, both in general and in relation to the ongoing advance. It has implications for public policy in the design of AI economic systems, ensuring both the

harnessing of AI for markedly better economic decisions and outcomes and the introduction of ethical systems characterized by equitable treatment for all. One implication is the impact on public policy in general, and on public agreements between regulatory bodies in particular. There are long-term agreements that have created institutions to manage the international monetary system built on the principles agreed by a range of actors. With the advancement of AI in the economic system, there are likely to be wider transnational agreements between corporate actors, but also states, in order to govern more agile frameworks for the regulation of international economic and financial flows. It is important the participation of civil society actors in the creation of these agreements and the institution of inclusive economic and policy-making processes paradigms that are capable of harnessing these new technologies steering them towards the broader welfare.

8. Conclusion

Artificial intelligence (AI) use increases in the fields of economics and finance. Developments in machine-decision processes and econometrics are taking place in an urgency to predict and optimize economic outcomes. However, scholars notice gaps between state-of-the-art economic models and the real-world economy. The Wall Street Crash of 1929 or the more recent 2008 financial crisis are historical reminders. Therefore, the economic and financial sectors should look for critical perspectives to avoid the recycling of past errors. With many AI models creating insights, a direct comparison with unidimensional traditional economic models might not be relevant. Moreover, rapid economic changes occur with globalization, such as digitalization or demographic shifts, creating a variety of complex interrelations, which are not fully captured by the current economic models. So, a perspective using AI to dig into economic data is needed. The paper underlines structural differences between the analyzed data sets through traditional econometrics with supervised machine learning models and remains very cautious (Bohdal et al., 2023).

If AI sophistication is to enhance economic practices, ethical considerations must guide these processes under the necessary perspective of society. One of the essential AI fairness conditions is to avoid discrimination regarding any group interacting with the model. These findings underline the tendency, when AI models are applied, to more severely affect the most deprived members of society. Moreover, there is a reinforcing process leading to increasing economic phenomena disparities in society. There is some warning regarding the current deep learning techniques, their black-boxness, and their inherent complexity. These issues may result in the decoupling of real-world applications and regarding the way results are on the theoretical micro-sociologically driven data or currently used experimental protocols (Giralt Hernández, 2024). Without integrating societal insights, a danger this AI evolution can bring about, the socio-economic marginalization of the most vulnerable persons could be further emphasized. Direct calls

to relevant centralized and politically influential stakeholders for pragmatic commitments are particularly tense within academic communication. Broad scientific and critical literacy levels pass beyond fulfilled PhDs. Nonetheless, the economic sector actors could undoubtedly involve collective judgment in more inclusive and fair applications. A fertile dialogue is thus needed. AI conceptual broadness goes from closer artificial intelligence to generalized augmented intersectional impacts on contemporary societal conditions. Hence, multi-inter-trans-disciplinary areas must collaborate closely for successful desired applications. A reflective approach is fostered on the ongoing AI implementation in society while keeping a sharp critical debate on its triptych mode. Assumptions are dismantled through those binary prisms, with an emphasis on the socio-economical divergence. A long-due multicultural and even millennial structural, respectful and vigilant thought on the otherness.

8.1. Summary of Key Points

Since the period of industrial initial revolution, economists are playing a key role to explain the behaviors of economic actors and to improve fairness and efficiency of economic system through creating regulations. Nowadays, economics and economic policies are still important in our complex society. Fairness and efficiency are hard to be realized at the same time because equality of costs is required to be equal to equality of values in economic models from 1870s. On the other hand, economy can also be regarded as one of big data, thus AI and Machine Learning are also expected to play some roles in reforming economic system (Zajko, 2020). Then, can the application of AI/ML to the economic system be said to be fair and efficient? And who keys are they to make the system be fair and efficient? In the current economic and social situation, development and deployment of AI/ML is a stiff task of governments and/or corporations. Application of AI/ML is desired for automation, which has been already utilized in many sectors such as manufacturing and banking. Unfortunately, if economists aim to only efficiency, the designed systems are likely to be unfair because the economic models are described based on the concept of representative agents, which is inconsistent with the reality where demands, preferences and/or revenues in several sectors are different from each individual. This inconsistency gives rise to inequality as an unfair system. Furthermore, there is a risk of crippling the economic system due to a crash in the underlying systems. There may also be a suspicion of whether the economic system is fair and/or inefficient.

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