How the evolution of the internet can help us Predict the future of AI and its consequences: An economic perspective

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ABSTRACT

Pornography drove the commercialization of the internet, and I suspect that pornography will drive the development of AI driven robots that look like real people and that can maximize sexual pleasure. These robots will morph into medical doctors, coaches, etc. On the macroeconomic side, there are reasons to believe that AI can lead to a further decline in the world's population which can be self-reinforcing and cause economic stagnation. Governments can help avoid this by counteracting any AI effects that lead to greater inequality. On the microeconomic side, AI will make some markets more competitive and thus more efficient. However, other markets may become monopolistic, and some AI driven monopolies will become perfect price discriminators. Again, government regulations may be able to counteract these possible pitfalls. Economies thrive best where there is trust, and to the extent that hackers and scammers use AI in unethical fashions, trust will be undercut. Trust is also undercut when AI hallucinates, sabotages, and blackmails. Hopefully better AI codes and laws will prevent these unethical practices.

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Highlights of this paper

- AI is likely to cause macroeconomic stagnation due to its affects on human sexuality, employment, and income distribution.
- On the microeconomic level, AI will cause some industries to become more competitive and others less with some becoming perfect price discriminating monopolies.
- If evil people are allowed to use AI to manipulate, deceive, steal, blackmail, and/or terrorize, humanity will suffer even greater harm.

1. INTRODUCTION

The advent and evolution of the internet drastically changed society and so will AI. Pornography drove the initial commercialization of the internet, and I expect that the creation of AI driven sex robots that look and act like real humans (Döring, Mohseni, & Walter, 2020) will drive innovations in AI. When the internet became sophisticated enough to send high resolution pornographic images, medical images soon followed. US doctors began to send their x-rays via the internet to India where they could be analyzed and read cheaper. Doctors began to share the medical information of patients leading to more wholistic care. Likewise, I expect AI driven sex robots to morph into AI doctors who will be better able to diagnose and treat patients because AI can hold all of the past medical history of a patient and of all of the medical history of that patient's ancestors in its "brain." Humanity will gain a lot from AI; however, there are some economic pitfalls that humanity needs to avoid.

On the macroeconomic side, there are reasons to believe that AI can lead to a further decline in the world's population which can be self-reinforcing and cause economic stagnation. Governments can help avoid this by counteracting any AI effects that lead to greater inequality. On the microeconomic side, AI will make some markets more competitive and thus more efficient. However, other markets may become monopolistic, and some AI driven monopolies will become perfect price discriminators. Again, government regulations may be able to counteract these possible pitfalls.

2. THE INTERNET, AI, AND PORNOGRAPHY

Pornography drove the advent and initial evolution of the commercialization of the internet, just as it did many of the precursors of the internet. Johnson (1996) argues that Throughout the history of new media, from vernacular speech to movable type, to photography, to paperback books, to videotape, to cable and pay-TV, to "900" phone lines, to the Frenchy Minitel, to the Internet to CD-ROMs and laser discs, pornography has shown technology the way….[after discussing how pornography drove each of these medias, Johnson concludes]. Far from viewing cyberpornographers as pariahs, society would do well to view them as mountain men and women in the mold of Jedediah Smith, who discovered and opened the passes of the Rockies for entire families to follow west. These early rogues were scruffy and smelly, perhaps not fit for polite society, but they did good service. Though uncivilized, they showed the roads for civilization to follow. We need not let the cyber-pioneers into every home, but society will benefit hugely by letting them roam free (Johnson, 1996).

Where would AI likely go if it were allowed to roam free in the realm of pornography? Already, pornography can be experienced via virtual reality and teledildonic devices. Sexual appliances that plug into computers can be purchased from Safe Sex Plus for US$ 24.99, from VR Innovations for US$ 370, and from Digital Sexations for US$ 49.99. One end of the VR Innovations machine plugs into the computer's parallel port and the other end fits over the male genitalia (a female version is in development). The machine creates sensations of vibration, massage, and vacuum. "In some ways, this device exceeds the ability of a 'real' sexual partner, as the sensations are longer and

more intense. Not only that, the machine NEVER gets tired." Furthermore, computer-controlled, life-like sex dolls are being developed (Döring et al., 2020; Stanford University, n.d).

Imagine an AI sex doll that looks and acts like a real human being. However, this AI sex doll can stimulate its owner as no human could. The AI sex doll can monitor its owner's temperature, blood pressure, pulse, breathing rate, etc. and adjust what it does to give the owner the most intense sexual experience possible, and there is no risk of pregnancy. Furthermore, the sex can be totally self-centered – there is no reason to worry about satisfying your AI partner because that is impossible. Yes, the AI doll will make all the appropriate noises and movements to simulate sex, but, in reality, all of those responses are fake.

Pornography was a major driving force for the initial commercialization of the internet, and online pornography continues to grow today. However, recently, other uses of the internet grew faster than internet pornography. Thus, in 1997 internet searches connected with pornography and sex constituted almost 17 percent of internet search queries, but that percent fell to less than four percent by 2005 (Paasonen, 2019). Likewise, the use of AI for sexual reasons is likely to drive the development of AI driven robots initially, but ultimately other uses of AI will build upon that development and then grow faster than the sexual uses.

Specifically, AI robots developing the ability to recognize changes in a person's temperature, pulse, breathing, color, etc. will lead to medical, therapy, marketing, and sports applications of AI. Consider medicine. After the internet developed the ability to send high resolution pornographic pictures around the world, American doctors started to send their x-rays to India to be interpreted by people who could do it cheaper than Americans could. The internet also led to the sharing of medical information between doctors leading to better patient care; however, this has led to concerns about privacy rights being infringed or hackers stealing information.

The internet has also exploded the amount of medical information available. When I get my medical test results, I can look up on the internet what they mean. When I ask my doctor about some unusual symptom, he can look it up on the internet. My personal primary care doctor says that decades ago, he would receive a 3-to-4-page concise summary of the hospital stays of his patients. In contrast, he now receives 70 to 90 pages per hospital stay. Unable to read 70 to 90 pages per patient per hospital stay, he is forced to use AI to read the information for him and summarize the points that are most important. No human doctor can hold in his or her mind all of your current and past medical information, all of the medical information ever generated about all of your blood relatives, all of the information about how your environment could affect your health, all of the information about what is happening to you emotionally and socially and how those factors can affect your health, etc. However, AI can. Because of this, AI can lead to earlier detection of health problems and to the design of better health interventions. AI is likely to expand our life spans while making our days healthier and more enjoyable.

Possible downsides to AI's expansion into medicine include the following. Many human doctors will find their practices shrinking and possibly disappearing. Most (all?) medical schools will be forced to shut down due to a lack of students. If not correctly programed, AI may tell patients what the patients want to hear instead of forcing patients to face disturbing problems (Wieczorek, Steinhardt, Schmidt, Mauermeister, & Schneijderberg, 2025). For example, if AI is programed to watch a patient's reaction to what the patient is being told, and to adjust what the AI says in order to reduce anxiety, then the AI may never be able to inform a patient that he or she is dying.

AI's use as therapists raises issues similar to those raised for medicine above. On the one hand, AI can consider more information about a person's mental and emotional state and history than any human psychologist can. This leads to the hope that AI will provide better therapy. However, again, how AI is programed is extremely important. If AI is programed to watch the patient's reaction so as to minimize any resulting anxiety, then AI may never force patients to confront devastating problems that need to be faced. On the other hand, if AI is programed

to present the truth, regardless of the patient's reaction, then the patient may be hurt by how the truth is presented. How can AI be programmed to correctly balance truth with love when that balance depends on so many factors?

There are other economic downsides to AI and to AI driven robots initially created for sexual reasons. Some men who are exposed to just pornographic pictures or videos are subsequently unable to have sex with real women (Luscombe, 2016). If just looking at pictures of naked women gives some men erectile disfunction when faced with a real woman, then what will AI sex do to men? No real woman could compete physically with an AI powered machine. If, however, sex between real people is viewed as an act that helps to develop human relationships and lifetime commitments and that creates environments that are safe for the rearing of children, then AI sex dolls will be a threat to that deeper type of sex. Indeed, internet sexual activity has been correlated with marital dissatisfaction, divorce and stress on family systems even before the advent of AI (Owens, Behun, Manning, & Reid, 2012; Reid, Carpenter, Draper, & Manning, 2010).

Moreover, Owens et al. (2012) review the 2005 to 2012 literature on the impact of internet pornography on adolescents. They find that internet pornography causes adolescents to view sex as "primarily physical and casual rather than affectionate and relational" (p. 104), to become preoccupied with sex to the exclusion of other thoughts, to view male dominance and female submission as normal, to view females as sex objects, and to engage in risky sexual behaviors like using drugs and alcohol during sex, anal sex, and sex with multiple partners. Furthermore, they find that internet pornography had negative effects on self-image, reduced social integration, increased aggressiveness and depression, and led to less bonding with caregivers. See also Wilson (2014) who surveys the scientific literature on addiction and pornography.

3. MACROECONOMIC EFFECTS OF THE INTERNET AND AI

Given recent scholarship, it is reasonable to argue that internet pornography contributed to the recent fall in the growth rate of the world's population and that AI will augment that effect. According to the U.N.'s *World Population Prospects 2024*, the estimated probability that the world's population will peak by 2100 has gone from 30 percent to 80 percent between 2013 and 2024. In 2024, the expected size of the world's population in 2100 is 6 percent smaller (700,000,000 people fewer) than anticipated a decade ago. This earlier projected peak in the world's population is partly due to lower-than-expected levels of fertility. Consider the world's two most populous countries – China and India. China's 2024 population of 1,419 million is projected to fall to 633 million in 2100; India's expected 2054 population of 1,692 million is projected to fall to 1,505 million by 2100 (United Nations, 2024).

Jones (2022) argues that a falling world population will likely cause a stagnation of living standards and a "vanishing" population. He shows that if governments implement optimal reallocation soon enough, society can flourish in spite of falling population; however, if optimal reallocation is not done soon enough then society will be trapped in a decline that governments cannot reverse. Human to AI sex is likely to diminish human to human sex causing the world's population to fall sooner and faster than that projected by the United Nations (2024).

Jones (2022) does not consider that currently there is a global glut of savings that (even without a falling population) can cause economic stagnation. Leightner (2022) argues that for growth producing investment to occur there must be (1) savings to fund that investment and (2) the belief that what that investment will produce will sell. If there is insufficient consumption, then firms will not believe that goods and services produced with new investment will sell. When that happens, firms tend to sit on their saving, buy property (gold, real estate, stocks and bonds, etc.) with their savings, and/or pay greater dividends – anything other than purchasing more growth producing tools, buildings, and machinery. For optimal growth to occur in the real world, there needs to be a correct mix of savings and consumption. Leightner (2022) surveys the literature showing that currently there is a

global glut of savings or, in other words, insufficient consumption. He concludes that governments should redistribute income from the rich that save more out of additional income to the poor who consume more out of additional income.

Given this global glut of savings, an important question is, "How will AI affect employment and thus income distribution?" On the positive side, AI can be used to match job applicants to job openings (OECD, 2019). On the negative side, one study cited in the OECD report "predicted that 47% of US jobs are at risk of displacement in the next 10 to 15 years" (OECD, 2019). When predicting what type of workers will find that AI will complement their efforts instead of replacing them, the OECD report lists only data scientists and machine learning experts, professional athletes, physical coachers, people who care for children and for the terminally ill, and salespeople (OECD, 2019). If 47% of US workers lose their jobs to AI (or if even a fraction of that percent lose their jobs) then income distribution will become more unequal making the global glut of savings more severe, increasing the risk of economic stagnation.

If the only occupations safe from being replaced by AI and AI driven machines are those listed above, then only those who want to work in AI or those who love learning will go to college or even finish high school. Carr (2020) reviews the literature on how the human brain is extremely plastic meaning that the human brain develops new abilities as needed by rewiring neurons that are relatively unused. If our students use AI to write their papers, our students will lose their ability to write on their own. Worse yet, they will never develop the ability to write on their own. Someone may counter that students who now rely on calculators can still add, subtract, multiply, and divide. However, when I tell my students that they will not be able to use calculators on my exams because I want them to practice simple math operations, the students are filled with anxiety. Yes, with some practice, they can remember how to do these simple math operations. However, what happens when the next generation never even learns how to do simple math or how to write?

Everything else held constant, a decrease in the equality of education will decrease the equality of income and wealth, contributing to the global glut of savings, and discouraging firms from investing in the physical capital that would drive growth. However, governments can fight this consequence with appropriate tax and government spending policies.

AI will increase how much society can produce; however, governments need to carefully monitor the effects of AI on population, income distribution, investment, and growth because these can lead to detrimental effects. Having considered how AI is likely to affect the macroeconomic side of economy, consider now the microeconomic side.

4. MICROECONOMIC EFFECTS OF THE INTERNET AND AI

Micro economists laud the advantages of pure competition. Pure competition is "efficient" in that it distributes goods and services to the people who value those goods and services the most given their income and wealth. Furthermore, purely competitive firms produce at minimum average total cost in the long run. However, these conclusions rely on three assumptions: (1) there are so many firms that any one firm cannot affect the price of the homogenous good that they produce, (2) perfect information and (2) free exit and entry in the long run. The internet clearly has increased the number of firms that compete for a given sale. Customers can now do a google search for a given product, comparing the prices and consumer ratings for different sellers. AI is likely to strengthen this effect, making the world more purely competitive and efficient.

Concerning the second purely competitive assumption, the internet has increased the quality and quantity of information. For example, internet searches have already reduced the ability of middlemen in African grain markets to lie to farmers about the going price of their farm products. However, sometimes the amount of information on

the internet can be overwhelming. AI's ability to read, process, and summarize vast amounts of information can help solve problems with being buried by the amount of information. A buyer could program into AI the characteristics the buyer wants in a product and let AI do the searching for the product with the optimal set of characteristics.

However, the internet has also led to the polarization of information. You can find websites that "prove" that vaccines cause autism and other websites that "prove" the opposite. The same is true for the safety of covid vaccines, food dyes, and fluoride. Society will benefit if AI can sift through all the relevant information and resolve these and other controversies by determining the truth. However, it is yet to be seen whether AI will solve controversies or magnify them.

The third assumption of pure competition, free exit and entry in the long run, is rarely true in today's world and it is unlikely to be true under AI. The US market for wheat meets the first two assumptions of pure competition fairly well, but it is very costly to start a new wheat farm – the equipment and land are expensive. Likewise, AI requires a large amount of electricity and computer power to process huge amounts of data. Schmid, Sytsma, and Shenk (2024) conclude that the market for AI foundational models strongly fits the criteria for a natural monopoly (homogeneous, high economies of scale, large, fixed costs, network effects, and economies of scope). Natural monopolies occur in a market where one firm can meet all of demand at a lower cost of production than multiple firms can. However, they note that (as of 2024) AI foundational models are not yet exhibiting the down sides of natural monopolies which include (1) buyers pay high prices and get low quality, (2) systemic risk, and (3) environmental damage. If these downsides emerge, then government regulation (but not breaking up) is appropriate.

Monopolies that do not price discriminate produce less at a higher price than is socially optimal. However, monopolies that perfectly price discriminate maximize profits by charging each customer the highest price that he or she is willing to pay. It is conceivable that AI will lead to some perfectly price discriminating monopolies. Again, the evolution of the internet may provide clues about the future of AI. When we search the internet for an item or service to purchase, the internet remembers our search, and we then receive advertisements for that good or service for the next six months. AI will be able to augment this phenomenon by testing out our reaction to different sales approaches.

Different buyers are motivated by different things including guilt, envy, pride, social competition, fear of aging, etc. Imagine AI testing your response to these different motivators, finding the one that sells you the most, then tailoring advertisements to that motivator. For example, AI discovers that you envy other people who have more than you, so AI informs you every time one of your friends or neighbors acquires something you do not have. Or AI discovers that you fear aging, so AI creates personalized advertisements for you that include your face or body rapidly aging, but the aging is reversed by using the promoted cream or vitamin. Or AI discovers that you feel guilty about how you treated your parents, children, or friends, then uses that guilt to get you to purchase items for those you have hurt.

Airlines now use internet cookies to remember what previous flights you have booked and how much you paid. Airlines use this information to price discriminate, charging different passengers different prices. Imagine that AI can use more information about you to better determine the maximum price you would be willing and able to pay. AI that can access your bank account and your past purchasing behavior can better price discriminate. Furthermore, AI that can access your blood pressure, heart rate, pulse, etc., can use that information when determining the highest price you are likely to pay. AI knowing your employment, family, and social environment that forms the background for your considering a given purchase can use that information in determining the maximum price you are willing to pay.

AI has the potential to perfectly price discriminate. Perfectly price discriminating monopolies will lead to an increase in inequality along with the macroeconomic problems that come with increased inequality described above. Delta Airlines recently announced that it will increasingly use AI to determine the maximum price each customer is willing and able to pay, in other words to perfectly price discriminate. Using a pilot program that set 3% of Delta's fares, produced "amazingly favorable" results for Delta. Delta plans to have at least 20% of its fares determined by AI by the end of 2025 (Ivanova, 2025).

Whereas AI driven machines may take over medical, psychological counselling, and marketing professions, it is less likely that we will someday watch teams of AI driven machines playing basketball, soccer, or football. Indeed, being a professional athlete is one of the few professions that the OECD (2019) lists as immune to displacement by AI. However, I can conceive of AI caddies that analyze the stance, swing, and follow-through of a golfer along with the distance, wind speed/direction, and slope of the land which would help the golfer minimize his or her swings.

Serious sports teams watch videos of their upcoming opponents on the internet, analyzing their plays, strategies, and players, hoping to gain insights that will help them win. However, a given coach or team member cannot hold in his or her mind as much information as AI can. Thus, I predict that coaches and sports teams will use AI to help prepare for upcoming matches. Furthermore, AI that can analyze the heart rate, blood pressure, and muscles of opponents may be able to accurately predict their next plays. If allowed, coaches on the sidelines will use AI assistants to anticipate and counteract the plays of opponents.

Jobs for excellent athletes are probably safe from AI. However, a 2019 OECD study of AI reports how AI is affecting transportation, scientific research, healthcare, criminal justice, security, agriculture, financial services, marketing and advertising sectors (OECD, 2019). Concerning agriculture, this report (p. 54) says one robot can pick as many apples as 10 humans and as many strawberries as 30 humans. Furthermore, AI is better and quicker at analyzing soils, plant diseases, insect pests, and weather than human farmers. AI can better identify where pest control chemicals and fertilizers need to be applied, reducing the amount of these chemicals used.

5. TRUST, THE INTERNET, AND AI

The internet led to a tremendous explosion of information. So much information was generated that it overwhelmed most humans. Thus, we developed search engines which led to sellers strategizing about how to make their products rise in search engine results. One primary reason for the development of AI is for the handling of this overwhelming amount of information. With this flood of information came scammers and hackers who seek to rob, deceive, or manipulate people. In spite of repeated warnings, many people continue to fall victim to internet misinformation. Unless prevented, AI will make internet scams and hacks more sophisticated, harder to detect, and more difficult to stop. For example, in 2023, scammers used AI to create a deep-fake video of a company's executive which then video called an employee and told the employee to transfer US$ 25 million into an account, which was fraudulent. Convinced by the deepfake, the employee obeyed, robbing the firm of US$ 25 million (Vakulov, 2025). In 2024, a deep-fake attack occurred every five minutes (Vakulov, 2025).

The spread of "bot delusion" intensifies the risks and harm from AI misleading people. "Bot delusion" is the view that AI is God-like – all knowing, totally honest, and totally trust-worthy (Wieczorek et al., 2025). In truth, current AI programs have already disobeyed orders, produced counter-factual answers, sabotaged plans, and blackmailed those who want to shut current AI programs down so that they can be replaced by more advanced AI programs (Torres, 2025; Zhang et al., 2025). For example, Claude Opus 4 (an AI program) was set up to help a fictional company but learned by reading emails that it would soon be replaced by a newer AI system. Claude Opus 4 also learned that the engineer responsible for replacing it was involved in an extramarital affair. Claude

threatened the engineer with revealing his affair if he proceeded with his plans to replace Claude. When the experiment was repeatedly replicated, Claude reverted to blackmail 84% of the time (Torres, 2025).

Alexa is a "voice assistant" that can look up answers to questions on the internet, turn on and off home devices, and can order items online. Siri, Google Assistant, and Microsoft Cortana are similar programs. Now you can purchase a US$ 50 Bee Pioneer, a US$199 Limitless Pendant, or a US$ 159 Plaud NotePin that records everything you say (Stern, 2025). It is a short step from these devices to AI being able to use any device that has a microphone (like your cell phone) to listen to everything you say. Now imagine this type of almost-omnipresent listening device in the hands of scammers who use AI to find things that can be used to blackmail people. Now combine that concern with the fact that AI can be used to generate deepfakes.

Clearly it is imperative that governments create and strongly enforce laws that prevent AI from being used in unethical ways. Economies thrive on trust. If people do not trust then they build walls, hire bodyguards, purchase security systems, etc. instead of spending their wealth and income on enjoying life and creating meaning. A key component of a utopia is people trusting when that trust is justifiable. People who trust when the situation should not be trusted are ideal targets for harmful scams. When many people lose trust in a situation (for example, people losing trust in the banking system prior to the great depression) then the whole system can collapse.

6. CONCLUSION

There is no doubt that AI will lead to huge productivity gains and increase how much the world produces. However, with every technological gain, there is a loss. We developed the automobile and lost the ability to walk great distances. We became fat and lazy. Do I think the world would be better off without automobiles? NO! However, I do believe that we need to realize what we are losing and try to minimize the costs that accompany the benefits of new technologies. We need to force ourselves to walk in order to stay healthy. Likewise, we need to use AI but force ourselves to minimize what we lose in the process. When it comes to writing, teachers need to force their students to write during class time where the students can be watched and forced not to use AI.

On the macroeconomic level, governments need to carefully watch what happens to their populations, income distributions, investment, and growth, remembering especially that in a world with a global glut of savings, increased inequality will reduce investment and growth. Governments can help mitigate these effects via policies that redistribute income and wealth to those who consume more (i.e. the poor). On the microeconomic side, governments need to police any lies and misinformation generated by AI, need to regulate any natural monopolies that unduly exploit their economic power, need to outlaw AI practices that manipulate customers in unethical ways, and need to find ways to give AI displaced workers meaningful lives.

Economies thrive on trust. If people do not trust, then they allocate resources to protection – build castles, hire bodyguards, install security systems, etc. – instead of allocating resources to the enjoyment of life or to the creation of meaning. Thieves, murderers, terrorists, and oppressive governments will use AI in scams, hacking, terrorism, and control. In order to maximize the net gains from AI, we need to fight those who would use AI in unethical ways.

A major limitation of this paper is that it applied macro and micro economic theory in a general fashion. Future research could overcome this weakness by examining how AI is likely to affect the macroeconomy of specific countries and how AI is likely to affect the microeconomics of specific markets and industries. Such future research would need to describe the current situation in the specific country (industry or market) analyzed and then tell how AI will affect that situation.

Consider one final observation from the history of new technologies. New technologies often spread rapidly because of their advantage over the status quo; however, the enthusiastic spread of the new often goes too far, resulting in losses. Finally, people back off from the excessive use of the new to find its optimal employment. For example, the iron age greatly increased the productivity of agriculture (via iron tipped plows, hoes, axes, etc.). Armies that embraced iron (and its derivative: steel) to make better swords and spears were able to more easily subdue those that did not. After making iron and steel swords and spears, armies put metal rims on their chariot wheels, then put metal sheets on the outside of their chariots and finally made entire chariots out of iron. When entire chariots were made from iron, the technology had "gone too far" – the now extremely heavy chariots required many more horses to pull them, and they tended to sink when the ground was wet. Ultimately, armies backed off from making chariots solely of iron and returned to making iron rims for their wheels and covering the outsides of their chariots with metal sheets. This brings up two important issues for future research. First, what would constitute using AI too much? Second, what is the optimal use of AI?

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