The Cognitive Economy

Automation anxiety grips the public consciousness. It is a fear of an impending unemployment crisis in the global economy, driven by the automation capabilities of artificial intelligence (AI). In reality, this dystopian fantasy fails to capture the bigger picture of how AI could positively shape the global economy. While automation will substitute jobs that involve the most routine of tasks, there are good reasons to also believe in the power of AI to complement the capabilities of the human workforce. The arrival of AI technology comes at an apt time in history. An accumulation of evidence suggests that long-term GDP growth has slowed down in advanced economies. Herein lies the opportunity for AI to influence the future of growth, driven by the spread of innovation, automation, and augmentation. AI will not only promote long-term growth by boosting productivity, but will also enable humans to take advantage of their higher-thinking, cognitive capabilities. AI offers an opportunity to build a global economy that thrives on cognitive work and to fuel growth in the 21st century.

**The Outlook of Growth**

In 1947 through 2001, U.S. GDP grew by an average of 2.2% per year. Since 2001, that average has been only 0.9%[1]. Other advanced economies in Europe and East Asia have fared worse, and it is for these reasons that economists sound the alarm on this trend[2]. Less GDP growth implies a decline in the improvements of living standards over time – certainly a phenomenon that does not bode well for future generations. What are the underlying reasons for this trend? Experts point to fewer hours worked, but more importantly, weakening labor productivity as the main driver of this decline in the decades since WWII[3]. The advent of artificial intelligence, however, offers hopes to boost labor productivity, and in turn, improve the outlook of long-term GDP growth. Analysts project that AI could double economic growth in advanced economies by 2035[4]. Understanding how requires us to explore AI and the mechanisms by which it could change the global economy.

**A New Technology and Modes of Change**

While artificial intelligence as discussed today finds its theoretical roots during WWII and the postwar era, it is breakthroughs in computation power, big data, and algorithms in the past two decades that have led to significant improvements in its capabilities[5]. AI is becoming increasingly capable of performing not only routine tasks, but even non-routine or cognitive tasks, such as legal writing or medical diagnoses[6]. At first reaction, this may seem to justify the fears of widespread labor substitution. Technology has always led to the creative destruction of jobs directly affected, and automation will certainly displace industries that involve strictly routine work, such as in service and retail. Beyond automation, however, innovations with AI will fuel growth in specialist and knowledge industries, and furthermore, augment the capabilities of the human workforce. History has shown complementary growth of technology alongside the industries that heavily depend on them. In the UK, for example, the last 150 years

have shown growth in medicine, education and professional services[7]. More importantly, there are reasons to believe in the room for AI to augment human productivity as opposed to completely automate it.

## Augmentation over Automation

There are significant differences between the capabilities of artificial and human intelligence, and hence, room for both to grow alongside each other. For one, AI still fails to possess the general mental capabilities that distinguish humans from bits. AI as implemented today, can be described as *weak* or *narrow*, as opposed to *strong* or *general*. A computer vision AI that has been trained to identify species of dogs would struggle in natural language processing to translate prose in Mandarin into decipherable English. Each algorithm is trained to effectively perform a niche task, and fails to generalize to others[8]. Humans, on the other hand, possess *strong, general* intelligence: the capability to perform and learn a wide variety of cognitive tasks, which make us particularly good at adapting to new situations and learning new skills. Secondly, AI is particularly good at automating redundant and menial tasks. Automating such niche tasks frees humans to perform more important work involving creative and critical thinking functions in the workplace. In a recent survey of American workers, 93% of respondents stated they spent less than a quarter of their workdays on creative business ideas or leads, instead being inundated by tasks such as scheduling calls or meetings[9]. In the future, businesses like PCB Solutions that employ AI technology could automate the logistical and administrative drudgery that hampers the workday. Playing to the strengths of both AI and humans could enable employees throughout the company hierarchy to produce greater value, by dreaming up and acting upon creative ideas.

## Envisioning a Positive Future

Strong AI, if and when it arrives, will justifiably force us to question what a post-work society might look like. Until then, there is great promise for narrow AI to deliver improvements in labor productivity, and in turn, a boost in the long-term GDP growth. As an aspiring engineer, my vision is to develop artificial intelligence that can make the 21st century worker across the globe capable of reaching his or her cognitive potential. To be sure, much more must be done to ensure the promised benefits of AI do not remain just an optimistic, techno-centric view. Governments must provide support and retraining to workers during periods of transition and frictional unemployment. Legislative policies must aim to combat worsening income inequality. Education must focus on enabling humans to utilize their higher-thinking capabilities. Businesses must invest in infrastructure and employee training so workers can fulfill their potential. All this will help build a future in which human workers not only productively coexist with AI, but one in which living standards continue to improve for future generations to come.

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