Prepare yourselves for the robot economy revolution

A cura di John Aziz sul tema della robotica, del lavoro e del basic income. (in inglese)

We are at the beginning of a tidal wave of new economic innovation and growth that will change the way we think about the economy forever|

Robotics and renewable energy - over the next century, these technologies are destined to dramatically alter the way humans live. These technological revolutions also can generate a booming economic future, even if global population flatlines.

But let me back up. Last week, I wrote an essay noting that if inequality is a result of the rate of return on capital exceeding the rate of economic growth, as French economist Thomas Piketty argues, then the evidence shows that over the last 200 years, capitalism has resulted in *less*inequality, not more. Economic inequality has mostly been a *decreasing* problem in capitalist economies, but a much larger one in feudal systems that enshrine hereditary privilege in law.

Today, however, inequality is by many measures on the rise again, and Piketty argues that in the 21st century we may see a return to the low-growth world that preceded modern capitalism. He seems to see the developed world sliding back toward what he calls "patrimonial capitalism," where the bulk of the economy is controlled not by entrepreneurs, but by hereditary dynasties. The logical endpoint of that regression, of course, might well be a return to something like feudalism.

This is justifiably a cause for concern. A feudalistic world where the vast majority of wealth is controlled by hereditary dynasties, and where people cannot rise to the top through hard work and good ideas would be pretty horrible to live in. But I am highly skeptical of the view that we are returning to a low-growth world.

Matt Bruenig argues that I have failed to respond to Piketty's central argument for why the economist projects slower economic growth in the 21st century. Bruenig writes that Piketty makes the case that population growth is going to decline, and population levels will stabilize:

This is actually a pretty common view among demographic experts who predict such things. In developed countries, you already see this. Population increases, Piketty claims, have generally accounted for around half the overall growth rate. If that's true, then the leveling off of world population will mean, all else equal, a halving of economic growth. Per-capita growth will become the only growth. Aziz says nothing about this. [*Demos*]

But population is only part of the story. Technology can drive growth even while the population remains

static.

The economist Thomas Malthus famously predicted famine due to a multiplying population that would have only a static amount of farmland. He was wrong, because he did not foresee the technologies of mechanized agriculture that allowed crop yields to rise hugely and feed the growing population. Similarly, those who predict stagnant growth today due to falling population growth are overlooking the changing technological dynamics of our time.

While the *human* population may level off, we are swiftly moving toward a world where humans are not the only productive agents. We're moving into the age of the robots - with robots taking over many roles in the manufacturing industry (illustrated beautifully by this chart showing falling manufacturing employment and rising manufacturing output) as well as moving into fields including food servers, bank tellers, telephone operators, receptionists, mail carriers, travel agents, typists, telemarketers, and stock market traders. While human beings may be constrained in their productivity by their own time and energy, assisted by robots, the economy can produce more without any additional people.

Unlike traditional workers, robots don't need feeding, clothing, or sheltering. They don't need to be paid for their work. They simply need to be programmed (something which can itself be increasingly automated) and powered by electricity. And while electricity is a constraint in the age of fossil fuels (where fuels have to be pumped out of the ground), in the age of renewable energy - the cost of which has fallen to such an extent that even Big Oil admits it will be the dominant form of energy on Earth by the end of the century - electricity becomes far less of a constraint. Need more energy to power more robots? Have your robots assemble more solar panels or wind turbines.

The technology I'm talking about isn't some far-off fantasy. In Malthus' day, the agricultural advances which derailed his predictions occurred mostly *after* he had made his predictions. Today, robots are cleaning up nuclear accidents, cleaning up oil spills, playing the trumpet, killing al Qaeda operatives in Yemen, driving around California, coordinating to design and build complex structures, and (yes) building more robots. This is the beginning of a tidal wave of new economic innovation and growth that will change the way we think about the economy forever, just as the agricultural revolution that proved Malthus' predictions wrong did.

Now, there may be environmental constraints on this new phase of growth. But even if switching from fossil fuels to renewable energy doesn't avert the problem of excessive carbon emissions causing runaway global warming, there already exist technological processes to reduce the greenhouse effect. They would be pretty easy to implement with lots of subservient robot muscle - planting lots of trees, scrubbing carbon dioxide out of the atmosphere, erecting a giant solar shade. Of course, other kinds of pollution - plastics in the oceans, methane, radiation spills, and other industrial waste - may cause environmental degradation, too. And we don't fully understand our environment, so we could encounter "unknown unknown" environmental threats. But again, if you have a little ingenuity and lots of renewable-energy-powered robots, these problems are likely solvable.

That doesn't mean I'm predicting a utopia. A robotic future could also unleash unimaginable horrors - imagine corporations or countries that control millions of robots going to war with each other, for example. And of course, while robots may add exponential amounts of productivity to the economy, they will also cost human jobs, at least to begin with. Humans displaced from their jobs by robots will have to

find new jobs in new fields, and that process may be slow and difficult. That means inequality between the rich and poor could remain stubbornly high as the rich capture the majority of the early gains from robotics.

But on a rising tide of growth, it will be possible to redistribute wealth from richer to poorer, if the political will to do so exists. In fact, high levels of job displacement will probably make it necessary to do so, perhaps through the implementation of a universal income program, where the government taxes the owners of the robots, and pays each citizen a guaranteed basic income.

So we can absolutely expect economic growth from the next industrial revolution, even if population growth falls to zero. But we'd do well to remember that economic growth doesn't necessarily mean living in a just, compassionate, or empathetic society. That is down to us, as humans.

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