

Taming technology

Opinion **Undercover Economist**

Why the robot boost is yet to arrive

The benefits of technologies such as self-driving cars will reveal themselves in time

TIM HARFORD



Pepper, a robot that can recognise human emotions. Though such machines are appearing in more workplaces, their presence has not led to a productivity surge, yet © Bloomberg

YESTERDAY Tim Harford

To adapt a 30-year-old quip from the great economist Robert Solow: you can see the [robots](#) everywhere except in the productivity statistics. This fact has been puzzling me for a few years now. Productivity growth is disappointing — especially but not only in the UK — and it has been for years. Unemployment is near record lows, and employment is high. All this is the opposite of what one would expect if the robot job apocalypse was upon us.

Yet there is no denying the remarkable advances in various [branches of artificial intelligence](#). The most talked-about example is the self-driving car. This technology has come a long way in a short time, which is more than one can say for the original participants in the 2004 Darpa Grand Challenge, a race sponsored by the US military. With large cash prizes for the first autonomous vehicle to complete a 150-mile course in the Mojave desert, the best effort foundered after just seven miles. The contest became a punchline. Just 13 years later, nobody is laughing about autonomous vehicles.

Then there are deep-learning technologies such as [AlphaGo Zero](#), which took just 72 hours to teach itself to become seemingly invincible at the formidable board game, Go. Alexa, Cortana, Google Assistant and Siri have made voice recognition an everyday miracle. Strides are being made in image recognition, medical diagnosis and translation. There are behind-the-scenes triumphs: deep learning is optimising power-hungry cooling in server farms.

All of this makes the puzzle of high employment and low productivity even more puzzling. Yet there are several ways to resolve it.

A simple explanation is that the robot talk is all hype. Computer scientists have been over-optimistic before. Nobel laureate Herbert Simon predicted in 1957 that a computer would beat the world chess champion within 10 years; it took 40. In 1970 Marvin Minsky predicted that computers would have human-like general intelligence “within three to eight years”, a prediction even more inaccurate than Mr Simon’s.

A more encouraging story is that we are understating productivity, for example, by undervaluing the output of services in general and the digital economy in particular, much of which is free and therefore invisible to normal measures of economic output.

A third possibility is that — to borrow an idea from the writer William Gibson — the future has already arrived, but it is unevenly distributed. Perhaps the zero-sum scramble to dominate winner-takes-all markets is simply squandering most of the potential gains.

To tease apart these accounts, a [research paper](#) by a team including both sides: Erik Brynjolfsson, an economist well known for his writings on “the new machine age”, and Chad Syverson, one of the leading experts on economic productivity.

The researchers argue that the productivity slowdown is real. It may feel plausible to suggest our data simply are not good enough to recognise that productivity is growing strongly, but the story seems off in a number of ways — most obviously that the [productivity shortfall](#) is just too large to be a statistical illusion. Something similar can be said for the zero-sum fight for corporate dominance: it may well be happening, but is it really so wasteful that huge productivity gains simply evaporate?

How, then, to resolve the puzzle? In the simplest way possible: to say, “just wait”. There is no contradiction between disappointing productivity growth now and spectacular productivity growth in the near future.

This is true in the narrow statistical sense that productivity growth tends to bounce around: a bad decade may be followed by another bad decade, or by a good one, and today’s productivity growth tells us little about tomorrow’s.

But it is also true that there tends to be a delay between a technical breakthrough and a productivity surge. The most famous case in point is the electric motor, which seemed poised to transform American manufacturing in the 1890s, but did not realise that potential until the 1920s. To take advantage of the new technology, factory owners had to turn their organisations upside down, with new architecture, processes and training. [Prof Brynjolfsson’s early research](#) in the 1990s found companies saw little benefit from investing in computers unless they also reorganised.

If the benefits of today’s new ideas are real but delayed, that may also explain the productivity slowdown itself. Consider the self-driving car: right now it is a research expense, all cost and no benefit. Later, it will start to displace traditional cars, the traditional car industry, and many related businesses from parking garages to automotive repair. Finally, perhaps decades after a self-

driving car becomes feasible, the full benefits are likely to be apparent. One does not simply invent a new machine: economic progress requires much more than that.

Perhaps, then, this is a brief lull before an explosion of new technology that will radically reshape the world around us. Or perhaps we are due for another decade or two of disappointment. Either scenario seems possible — and both of them promise an uncomfortable ride.

tim.harford@ft.com

[Copyright](#) The Financial Times Limited 2017. All rights reserved.

Explore the series

ABOUT THIS SERIES

Flexibility ignites clashes when big tech, small tech and disrupters force change in work, regulation, tax and markets — as Uber's problems show. What business models will fit the digital economy? Here's the best of this week's comment and analysis

Currently reading:

Why the robot boost is yet to arrive

The tax reform the US really needs

How Small Tech can move fast and fix things

Stock options: tech tax Premium

Prepare to bet against bitcoin as it becomes civilised

GE and Siemens: power pioneers flying too far from the sun

WTF? What's the Future and Why It's Up to Us, by Tim O'Reilly

[See all 11 stories](#)