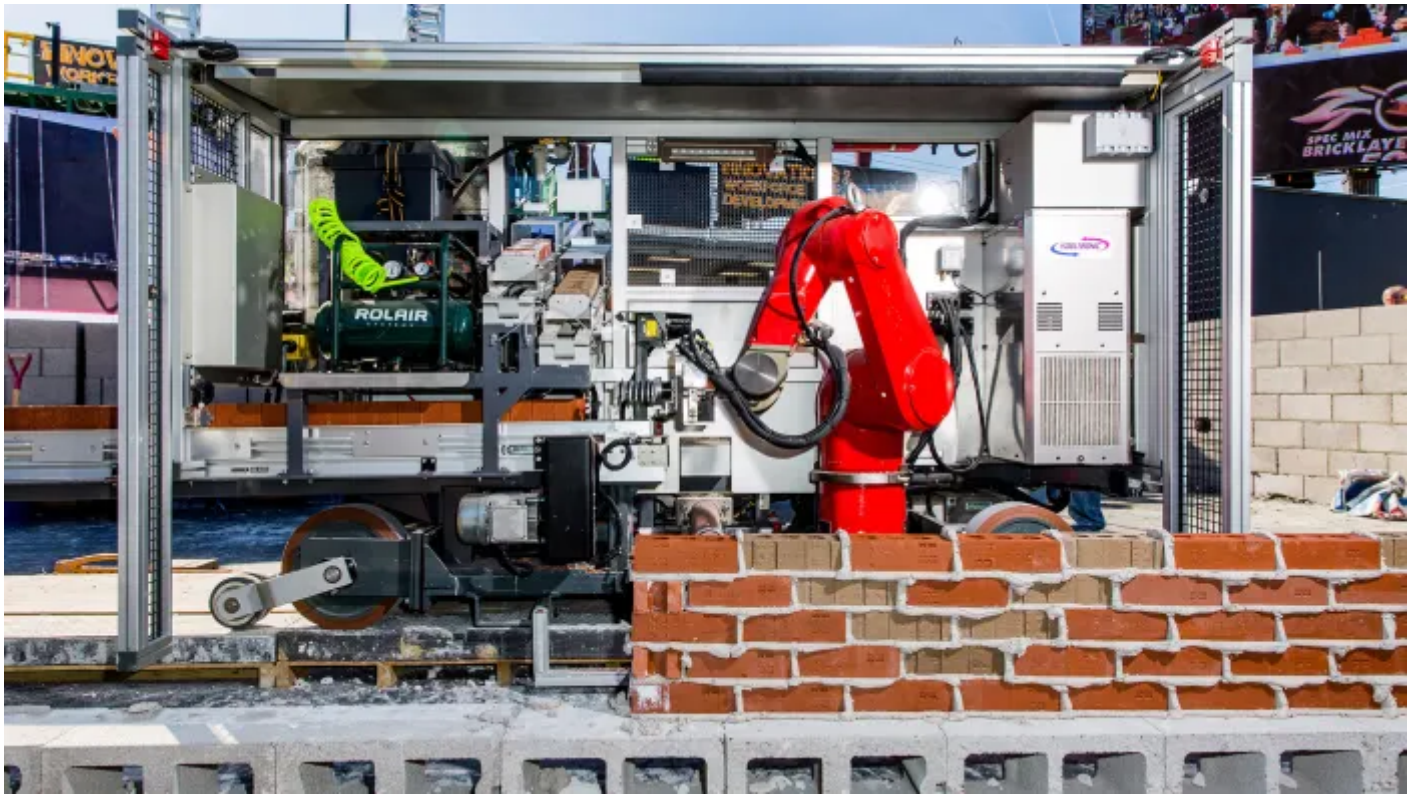
FT Books Essay Non-Fiction

Does tech threaten to rerun the worst of the Industrial Revolution?

Well-argued book 'The Technology Trap' raises alarms about the impact of change



The rise of robots such as automated bricklayers has already had a big impact on jobs, particularly in the US © Eyevine

John Thornhill 9 HOURS AGO

Accusing someone of being a Luddite today implies that they are a thoughtless opponent of progress, resistant to technological change and guilty of obscurantist obstructionism. But, as Carl

Benedikt Frey argues in his provocative book on technological revolutions, this reading of history disguises an important truth: the Luddites were right.

It is incontestably the case that future generations enjoyed the extraordinary fruits of the Industrial Revolution's "great enrichment". The world was transformed by the mechanisation of agriculture and manufacturing, fuelling an astonishing surge in living standards in Britain and many other parts of the world. Sadly, though, most of those who lived through this massive economic upheaval were not among its main beneficiaries. It is hard to argue with the Communist writer Friedrich Engels, all too familiar with the dark, Satanic mills of 19th-century Britain, when he wrote that the machine-owning industrialists grew "rich on the misery of the mass of wage earners".

The central concern that runs through *The Technology Trap* is that, unless we are very careful, our latest technological revolution may well turn out to be a tumultuous rerun of the Industrial Revolution, with dire social and political consequences. "The message of this book is that we have been here before," writes Frey. An opinion poll by the Pew Research Centre survey in 2017 found that 85 per cent of US respondents favoured policies to restrict the rise of the robots. The Luddite impulse may well return.

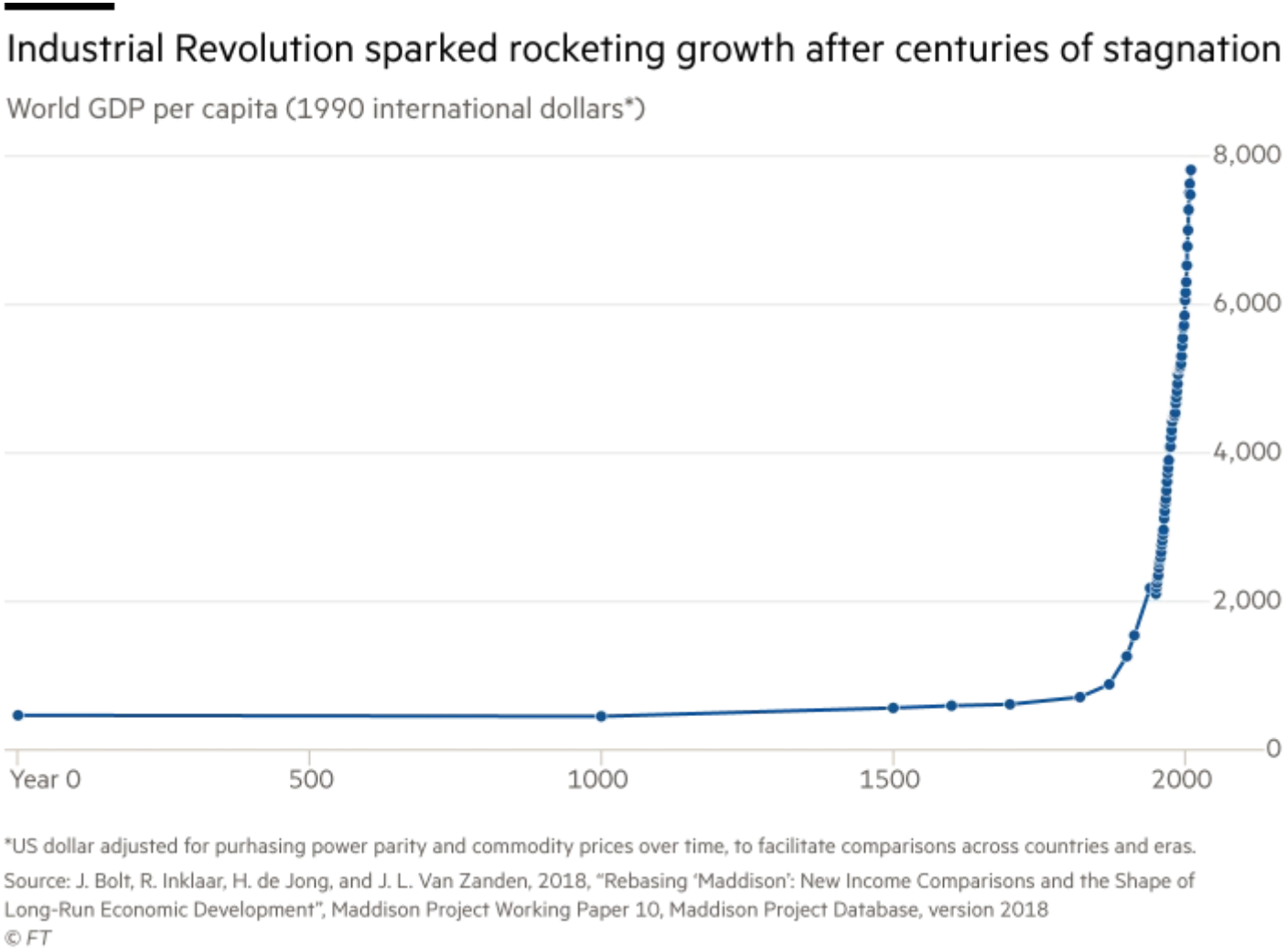
Frey's analysis is worth taking seriously because the Oxford economic historian and economist has researched his subject deeply and has co-authored one of the most widely cited studies on automation. His 2013 paper, written with the technologist Michael Osborne, estimated that 47 per cent of US jobs were at high risk of automation because of the impact of artificial intelligence. Frey is certainly open to the idea that AI could result in a massive productivity surge, just as we saw in the Industrial Revolution. But the danger is that the gains will be unequally distributed and will take a long time to benefit all. "The short run can be a lifetime for some," he writes.

It was certainly more than a lifetime for the original Luddites. Those textile workers who smashed machines in cotton and woollen mills across middle England from 1811 to 1816 were, as Frey argues, perfectly rational economic actors. The introduction of water frames, carding machines and spinning jennies eradicated many jobs, sucked cheaper child labour into the workforce and

suppressed wages. Hand loom weavers, once known as labour's aristocrats, became the tragic losers of the Industrial Revolution.

In his 1797 book on poverty, Sir Frederick Eden wrote that machines promoted the general wealth but "throw many industrious individuals out of work; and create distresses that are sometimes exceedingly calamitous".

Frey adds: "Three generations of working Englishmen were made worse off as technological creativity was allowed to thrive. The full benefits of the Industrial Revolution took more than a century to be realised."



The factories that later fuelled the Industrial Revolution and powered the British empire were certainly miserable, and dangerous, places to work, as Engels observed. Life expectancy in Manchester in 1850 has been estimated at 32 years, well below the national average of 41 years. Men were on average shorter in 1850 than they were in 1760.

It is sobering to note that part of the reason why the Industrial Revolution accelerated in Britain, while stalling elsewhere, was because of the brutality of the authorities in suppressing dissent. In 1769 legislation was passed making the destruction of machinery punishable by death. In 1812 and 1813 more than 30 Luddites were hanged. Unlike the French, British governments were prepared to deploy mass coercion to repress machine breaking because they were more worried by external, rather than internal, threats. As Frey puts it, the Industrial Revolution was responsible for many revolutionary technologies but it was also responsible for many political revolutionaries.

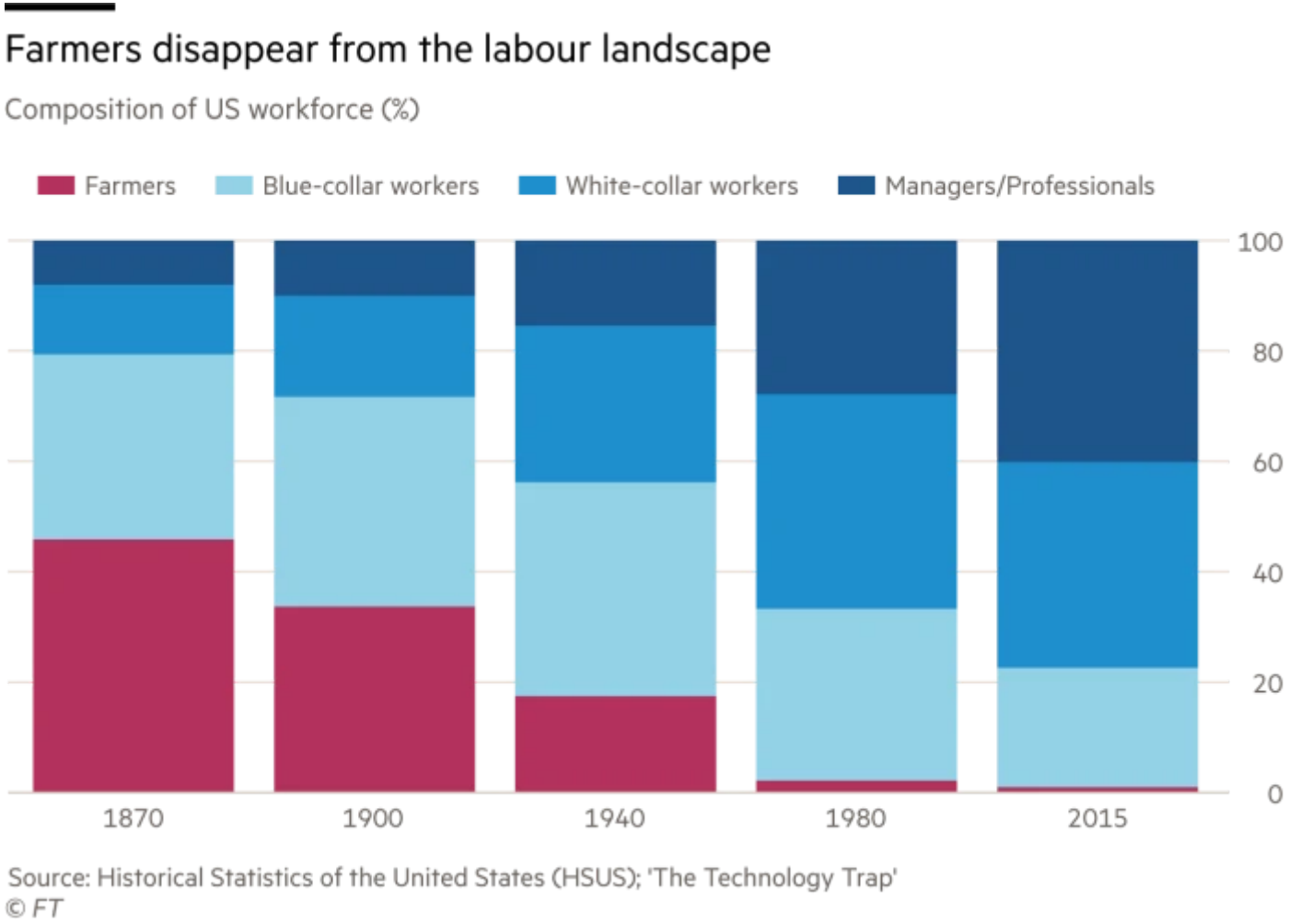
Many other countries were caught in what Frey calls a technology trap in which labour-replacing machines were vigorously resisted for fear of their disruptive force. The influence of medieval guilds, which were particularly active in blocking many of the inventions developed during the Renaissance, lingered long. “Guilds vehemently and successfully resisted technologies that they perceived threatened their skills and rents.”

Frey’s argument is that we downplay the human cost of the Industrial Revolution because of the very different, and far happier experience, of automation experienced in 20th-century America. In particular, he is critical of those economists who regard this later period of “statistical abnormality” as somehow encapsulating immutable and universal laws about technological progress.

The most significant difference between the two eras was that technology was primarily labour-enabling during the American century, whereas it had been mostly labour-replacing in earlier centuries. It is true that some jobs, such as lamplighters and elevator operators, were eliminated altogether. But electricity and the internal combustion engine, the two general purpose technologies of the 20th century, helped improve the material wellbeing for the majority of working people. “While the 20th century was a period of unprecedented churn in the labour market, it was also one in which most workers could still expect to come out ahead,” Frey writes. The first three-quarters of the 20th century are rightly regarded as the “greatest levelling of all time”.

Agricultural productivity was transformed by machinery freeing millions of workers from the land. The proportion of farms with tractors increased from 3.6 per cent in 1920 to 80 per cent by 1960.

The mechanisation of the household liberated millions of women from time-consuming domestic chores, enabling them to enter the formal workforce and increase household incomes. The introduction of running water, electricity, refrigerators and washing machines cut the workweek of the housewife by a staggering 42 hours between 1900 and 1966.



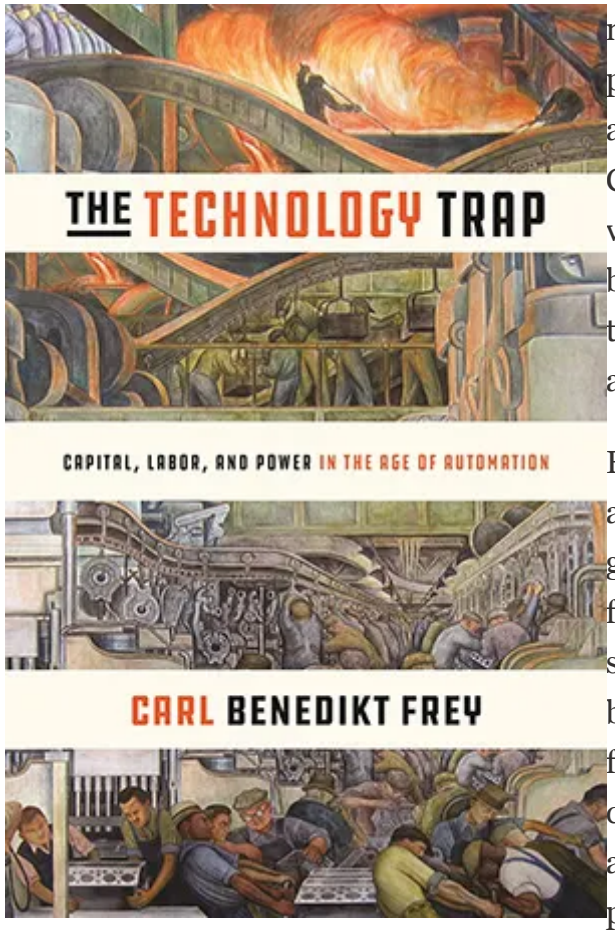
Technology had the added benefit of making work less hazardous and physically demanding. It also led to better paying jobs. Between 1870 and 1980 hourly pay kept track with labour productivity.

Higher union density resulted in lower levels of wage inequality. The expansion of secondary education enabled workers to perform higher value added jobs. Corporate paternalism and the welfare state flourished. One of the great achievements of the 20th century was the creation of a prosperous middle class. “As America got richer, it also became more equal,” Frey writes.

But over the past few decades, this virtuous upwards circle has been thrown into reverse, and the middle class is under threat. Politicians in many rich countries have attacked globalisation and immigration as the culprits for the latest social dislocation. But, controversially, Frey argues that the computer revolution has been just as much to blame. The next wave of automation is coming for all manner of manufacturing, transport, retail, logistics and construction jobs. “We are now living through another period of worker-replacing technology,” he writes. In this regard, the computer revolution has not been the continuation of a century of mechanisation but the complete reversal of it. “The computer revolution more closely resembles the experience of the Industrial Revolution,” he writes. Of Americans born in 1980 only half are better off than their parents. The comparable figure for 1940 is 90 per cent.

As we have seen, economic earthquakes often result in political shockwaves. Frey notes that the number of robots in the US increased by 50 per cent between 2008 and 2016, each of them replacing about 3.3 jobs. He highlights a correlation between those states with the highest robot density and those states that unexpectedly swung behind Donald Trump in the 2016 presidential election, namely Michigan, Pennsylvania and Wisconsin. “The robot revolution is largely a Rust Belt phenomenon, and this is also where Trump made the greatest gains for the Republican Party,” he writes. “There’s clearly a relationship between levels of automation and voting patterns, which provides a powerful explanation for why three states — which went Democratic in every presidential election since 1992 — ended up being won by Trump.”

By concentrating predominantly on the Anglo-American world, Frey tells only part of the global technological story. The perspective is very different when viewed from the rising economic powers of Asia, most notably China, where millions have been lifted out of poverty and robots have been



mostly embraced as a means of increasing the productivity of an ageing population. If Frey is right about the technology trap then this may also imply that China could leap ahead in the AI arms race. Sensitive to voter interests, western democracies may yet touch the brakes when it comes to mass deployment of AI technology, while authoritarian regimes hit the accelerator hard.

Frey's story is well argued and — at times — deeply alarming about the stability of western democracies given he predicts the further concentration of wealth in a few hands and in even fewer locations. His scrupulousness as a scholar, though, detracts from the book's political punch as he refrains from spelling out the full implications of his argument. He raises many good questions but falls short in sketching out satisfactory answers. He dutifully runs through a checklist of policy proposals that could help smooth the technological transition, but none are wholly convincing. He is sceptical of Universal Basic Income, the magic bullet solution for much of Silicon Valley, and prefers life-long learning accounts, wage insurance and tax credits. His most radical, and politically incendiary, suggestion is to scrap zoning restrictions on property use given that the "curse of geography" is only likely to intensify.

His conclusion is that technology is not destiny. Neo-Luddite voters may yet stymie the rise of the robots. The political economy will prevail. "In a world where technology creates few jobs and enormous wealth, the challenge is a distributional one," he writes.

The Technology Trap: Capital, Labour, and Power in the Age of Automation, by Carl Benedikt Frey, *Princeton, RRP£24, 480 pages*

John Thornhill is the FT's innovation editor

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