Preface

Robots, which in this preface we will regard as including artificial intelligence, offer tremendous hope for humankind. They open the way for a world where the elderly are cared for, where the infirm can walk, where everyone can drive into the city and where people living in remote areas can enjoy many of the benefits of living in a town. A world where robot sentries guard your home and do the garden and you swallow a robot surgeon who operates on your stomach. They also open the door for increased prosperity for all, together with enhanced leisure time. And yet people are concerned that in the end robots will not lead to this vision of nirvana, but create inequality and unemployment; that they will help to destroy democracy and open the way to a surveillance state, increased criminality and lead to robot wars. Some even fear that they spell the end of human existence as we know it, either because the machines take over or because exoskeletons and brain implants change us to the point we are not recognisably human. Regardless of the extent to which either of these scenarios is true, robots will dramatically change our lives and will in the process inevitably change us.

Robots are clearly different to any other technological revolution we have had. Previous innovations provided new products or new methods of production. In doing the latter they made humans more efficient. To an extent, robots do all that, but they also replace humans in both the workplace and the home and they do this across virtually the whole range of human activity. There is simply no precedent for this. No innovation in history has been so anticipated in fiction and it is here that we see much of the worst of what might happen with the robot story. Many academics regard these fears as exaggerated. Thus, some say we are years, decades, away from getting near to the stage at which robots can think for themselves at a level at which they become a threat, and even then it may well never happen. This seems far too complacent, and whether it is years, decades...
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or centuries away, we should care about, and plan for, the possible adverse impacts on humanity.

Some economists have also been too complacent in arguing that unemployment will not be a problem, as robots will open the way to a host of new jobs that ‘we can scarcely imagine’. Relying on the assumption that major innovations in the past have always resulted, after possible initial problems, in no reduction in employment, misses the point that this technology is different. Other technologies augmented human capital. This one replaces human capital, and the past may no longer be a good guide to the future. The critical question is the proportion of human activity robots replace, and on that we just do not know. Other economists do not fear unemployment per se, but they do fear increased inequality and point the way to solutions. Still other economists are arguing that, yes, unemployment is also going to be a problem.

Robots replace humans as they are potentially superior on all dimensions. In terms of manoeuvrability, they will be able to change from wheels to legs, go underwater and then into the sky. They are not limited to two hands, they can have all-round telescopic and x-ray vision, and they can detect sounds humans cannot as well as other facets of the environment such as levels of radiation. They can calculate many times faster than humans, and instantaneously interact with other robots. They are still a long way behind humans in many areas such as empathy, creative thinking and even something as simple as distinguishing an apple from a pear. But these problems are likely to be solved. If we were put on this Earth as part of an experiment to see whether starting from scratch we could construct machines which outmatch us and other life forms in every respect, we are getting close to the ‘successful’ end of the experiment. The question is: what happens next?

There are two sets of problems that might arise from the robot revolution. The first are fairly direct: robots replacing jobs, robots spying on people in their home, robot criminals and hacking into robot systems to cause massive chaos. But the second are the unintended consequences, which may take centuries to play out. Some we can foresee, others we cannot. For example, in relying too much on robots to do our thinking, our minds may regress. In relying on robots in the home, people may have less contact with other people, may have fewer children, and may marry less. Of course, the opposite may happen: with increased leisure time, people may socialise more.
We do not know. But we should be prepared. We should also try to implement policies that pave the way for the positive impacts.

In terms of what to do about robots, countries in isolation have no choice: they must set out to take full advantage of robots in the workplace, hopefully in forms which complement human labour rather than replace it, and which enhance wellbeing and do not reduce it. If they do not do this then they fall behind other countries and are then likely to suffer more, not less, unemployment. They must also regulate robots, possibly licensing some. Redistributions will help with the inequality problems. Other issues, such as robot soldiers, are best solved, if at all, by international agreement.

These are all issues we deal with in this book. It is written from the perspective of an economist, but one convinced that we must have some understanding of the underlying science. Hence there is a chapter on this, and a related chapter looking at all the different types of robots. Another chapter reviews the history of robots to the present day, both in fact and in fiction. There are two empirical-based chapters, where we examine the impact of robots on the labour market and also people’s attitudes to robots. Two more chapters look at the impact of robots, positive and negative, on the economy, society and people and what policies to pursue in order to maximise the benefits and minimise the downside. Finally, there are two chapters on innovation and what lessons we can draw from our analysis of robots for theories of innovation. Thus we argue that such theories are too focused on the process of innovation and not enough on its impact on people and society.

This does seem to me to be one of the most important issues facing us today, a perception that grew as I wrote the book. Governments must pursue policies that ensure that we take full advantage of the positive potential of robots and to make their economies as productive as possible. But they must also, either acting on their own or collectively, try to control some of the negative impacts of robots. I must admit that, whilst recognising the benefits robots will bring, I do have substantial concerns about the impact robots will have on people, our society, our economy and humans per se. Whether it is possible to prevent all, or even just the worst of, the negative impacts I do not know. I am not overly optimistic, but I also know that it is critical that the attempt must be made.

In a sense the book is telling a story, well before the end of even the first act. I am fairly sure that part, at least, of the second act will
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take us by surprise, and we will be even more surprised by the end of
the final act. But as economists and social scientists we cannot wait
till the end of the story before taking a view. We have to make policy
decisions now, both to maximise the benefits and to try to protect
society against the problems.

A few final thoughts. Robots will change just about everything,
sometimes because of what they do and sometimes because of how
people and governments react to them. So as individuals make the
best of the opportunities, this will open up. Your world will change
beyond recognition over the next 30 years and in many ways you will
benefit enormously. Finally from my own perspective, robots will
have a fundamental impact upon economics as well as the economy,
and it will be fascinating to see this unfold.