
7 Reassessing tax policies and tax coordination: The case for a tax on automation

Pedro Teles

Catolica Lisbon School of Business & Economics, Banco de Portugal and CEPR

One of the fiscal challenges in Europe, as in the rest of the developed world, is how to deal with the social impact of widespread automation. How can we make sure that the benefits from innovation in automation and artificial intelligence are not confined to only a few? Automation threatens to destroy many of our jobs; this may be a reason to tax robots, the intermediate goods that are associated with automation, and artificial intelligence. Both the impact of automation on the job market in Europe, and possible policy remedies, have been discussed in different forums (e.g. McKinsey&Company 2017), and also in the European Parliament.¹

In a paper produced as part of the ADEMU project (Guerreiro et al. 2018), my co-authors and I deal with precisely this issue. Who are the winners and losers from automation? And how can taxes be used to compensate the losers?

A good principle of optimal taxation is that taxes should not distort production. This means that intermediate goods should not be taxed. Since robots are intermediate goods, they should not be taxed. No restrictions should be put on automation.

But what if, as a result of automation, the jobs of a good part of the working population are destroyed on a large scale? What if we are not talking about just a few routine tasks or occupations, but rather all tasks that can possibly be automated? How can we prevent

¹ See <http://www.europarl.europa.eu/news/en/press-room/20170210IPR61808/robots-and-artificial-intelligence-meps-call-for-eu-wide-liability-rules>

a large share of the population, instead of benefitting from progress, actually being made terribly poor?

Why should we tax robots?

Bill Gates recently came up with some thought-provoking ideas on this, calling for a tax on robots.² The European Parliament discussed such a tax a year ago and rejected it.

As it turns out, Bill Gates is right – for the wrong reasons, but he is right. Robots should be taxed.

So, what are the right reasons to tax robots? As the costs of automation go down, robots inevitably (unless a robot tax is used) replace routine labour. It turns out that it is not that easy to change occupations. If you are routine, how do you become non-routine? If you are not empathic, and not very creative, how can you find a job that a robot won't do better, and cheaper?

These are the people that we should make sure get compensated for their bad luck in being born with the skills that a robot can imitate, whether a secretary or a brain surgeon. There may be quite a lot of us.

How can we make sure that everyone benefits from automation? How can the distribution be done efficiently?

If we could tax different people differently, based on their type, then the problem, at least academically, would be easily solved. But we cannot. We can tax people based on their income, but not on their type. And that is a limited way to distribute.

In a seminal paper, economists Peter Diamond and James Mirrlees showed that good policy does not tax intermediate goods as long as all net trades can be taxed at different rates (Diamond and Mirrlees 1971). Different types of labour supplied are different net trades and therefore, in the model, they can be taxed at different rates. In the real world, that's tax discrimination, and the law typically does not allow for it. Because different people cannot be taxed at different rates, taxing robots may be the way to go. A tax on

² See <https://qz.com/911968/bill-gates-the-robot-that-takes-your-job-should-pay-taxes/>

robots is a tax on the non-routine, and a subsidy for the routine, and even if it distorts production, it should be part of the fiscal policy mix.

In a different set up, in which the assumption of non-discriminatory taxation is justified by information constraints, good policy must make sure that the different types are happy with their allocated bundles. The tax on robots is used to make it easier to provide those incentives.

A tax system must ensure that the non-routine do in fact prefer to work hard, rather than earning the relatively low income of the routine, consequently paying less taxes, and working less. Raising the robot tax raises the pre-tax wage of the routine and lowers that of the non-routine, increasing the hours that the non-routine would have to work to earn the income of the routine.

Robot taxes are used because they change relative prices. And relative prices can relax the relevant information constraints.

How much should we tax robots?

So these are the reasons why taxing robots is a good idea. But how much should we tax?

That depends on how restricted the tax system is. If the only restrictions are information constraints, the answer is, not much. In our numerical examples, the tax rate would be at most 10%. But if there are additional restrictions, the rate could get all the way up to almost 40%.

If the tax system was restricted to be just like the one we have now, but more progressive, then despite the progressivity and high robot taxes, routine labour is still made relatively very poor by automation.

There is a better way to redistribute. A system with progressive taxes but with a universal transfer substantially reduces the costs of redistributing. The universal transfer is the

unconditional basic income that has recently been discussed, and dismissed, in the European Parliament; interestingly, also in the context of the perils from automation.³

Should robot taxes be coordinated in Europe? In order to be effective, there should be coordination on such taxes. The reason is that the incentives to compete over these taxes, in an attempt to reap the benefits of innovation in automation, are very strong.

Related ADEMU studies

Work as part of ADEMU on reassessing tax policies and tax coordination covers many other issues. Kehoe and Pastorino (2016) argue that there is no need for a union-level fiscal authority providing insurance against country-specific shocks if financial markets are well functioning. Chari et al. (2017a) summarise some of their work on the formation of the Economic and Monetary Union and on the recent challenges that it has faced, arguing that the key mechanism is lack of commitment. Correia (2016) analyses the implications for efficiency and equity of lower capital taxes due to tax competition. Chari et al. (2017b) compute optimal coordinated policies and discuss how tax systems can be designed to allow for flexibility in the setting of taxes by the different countries, and also impose the good principles of free trade and no taxes on capital. Valued added taxes with border adjustment are designed to ensure free trade. Conversely, taxation of capital income is high in almost every European country, and the design is flawed. The US is far ahead in this respect, with the new cash flow tax with investment deductions. A tax on capital income with a full investment deduction taxes the initial capital without distorting capital accumulation.

Other ADEMU papers on optimal taxation of labour and capital are Abrahám and Carceles-Poveda (2016), Caballe and Dumitrescu (2016), Reis and Panousi (2017), Kapička (2017), and Reis and Teles (2018).

³ The Committee on Legal Affairs of the European Parliament prepared a report stating that “in the light of the possible effects on the labour market of robotics and artificial intelligence a general basic income should be seriously considered”.

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About the author

Pedro Teles is a Full Professor at CATÓLICA-LISBON. He is also a Researcher at the Bank of Portugal and a Research Fellow of the CEPR. He holds a PhD in Economics (The University of Chicago) and an undergraduate degree in Economics (UCP). He was a Senior Economist in the Research Department at the Federal Reserve Bank of Chicago between 2001 and 2004, and has taught in the Ph.D. programmes at Universitat Pompeu Fabra and University College London. He has worked on various issues of monetary and fiscal policy, including the optimality of the Friedman rule, time consistent policies, optimal stabilization policy, optimal currency areas, instruments of monetary policy, sovereign default.