What happens when the taxman gets superpowers?

The consequences of the Zero Cost of Control phenomenon* for your business

** We are aware that, strictly speaking, we should call it the Near Zero Marginal Cost of Control phenomenon.*

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Executive Summary

Digitalisation and disruption are key global trends in today's businesses. While companies have focused on changing their own business models, the next stage in digital transformation – the digitalisation of public administrations – hasn't been given much attention to date: the new world of big data, machine learning and artificial intelligence will soon give the authorities more information and enable new and enhanced capabilities for assessing data, facilitating the expansion of their scope of action to an unexpected and maybe even unintended extent. And they will be able to exercise these capabilities – in particular with regard to control and compliance with the law – at almost zero cost.

We're already observing the first indications of this change in the area of tax. It's clear that the tax authorities will play a leading role in this development, and the impact on business will be significant. The increasing amount of information available for processing means that we are almost 'naturally' evolving towards an age of transparency with sophisticated analytics techniques and real-time access to business data. We believe that while this trend might lead to a bright future for business in the long term, the short- to medium-term transitional phase will be turbulent and present some entirely new challenges for companies to handle.

We believe that we are fast approaching an inflection point that business leaders aren't aware of, and that this may lead to the last thing an organisation wants from its tax position: surprises. In this paper, we show you what the digitalisation of the tax authority means for business, and what you have to consider to ensure you're prepared for this new world of tax.

1. The digitalisation of public administration: future developments in a nutshell

Looking at media and academic attention you might conclude that the impact of digital change can only be observed in the private sector. Often, it seems that public bodies are viewed as mere bystanders in the digital transformation of private business, responsible only for governance and regulation.[1] The huge change that the digital transformation of public administration will bring hasn't been widely commented on. While it's true that digitalisation has impacted the private sector first, the same methods identified and refined by private organisations can easily be transferred to public bodies. As a result, we will now see significant disruption in the public sector.[2] This development can be viewed as the next logical step, and its impact might be even more fundamental than it was in the private sector.

The prevailing image of the public administration as a bystander might be due to the authorities' reputation for being slow to adapt, in particular when it comes to technological change. However, this assumption might be a mistake, and one that could lead to a major turbulence for businesses who make it – and suddenly find they've failed to adequately prepare for the regulatory and legislative environment that now confronts them.

Predicting the resulting change in the landscape of public administration isn't easy, but since large parts of the business world are already going through a very similar transformation, we can look to this sector for some pointers of what might be to come (For more detailed information on this see our other paper, "When the sleeping giant awakes… The disruptive impact of the Zero Cost of Control phenomenon on business and society").

1.1 Effects of digitalisation on the economy at large

"… digitisation has some features that suggest that many well studied economic models may not apply …"[3]

As more and more elements of the global economy are being digitised, more data is being generated in digital formats. Newly available digital technologies such as advanced analytics, machine learning, artificial intelligence and robotics help to process huge amounts of data much more efficiently than traditional methods. Coupled with this, now digitised goods and services have some unique economic properties, such as almost zero marginal costs of reproduction[4], which lead to some interesting economics for digitised economies, notably with respect to productivity and market returns.

"A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker"[5]

Productivity growth, for example, is mainly driven by efficiency (automation is one key aspect here) and innovation.[6] Now, digitalisation has a profound impact on productivity, because it increases efficiency significantly. Digitised goods and services can be manufactured in higher quantities and/or with better quality at the same cost.[7] In addition, academic studies in the new era have already shown that firms making heavy use of information technology show higher performance and productivity growth.[8] This means that, together with innovation power, digital technologies also enable the manufacture of tangible goods and services as before, but at significantly lower cost.

As for market outcomes in the private sector, winner-takes-most markets and so called "superstar markets" are very often observed in digital economies. These markets demonstrate a power law or Pareto distribution with the infamous 'long tail' (as a rule of thumb, 20% of the participants get 80% of the returns).

These two effects, productivity growth and winner-takes-most markets, are primarily responsible for the disruption that we are observing in the business world right now. We believe that in a shorter amount of time than you think, this will also be the case for the public sector.

1 E.g. S. Greenstein, A. Goldfarb and C. Tucker, "The Economics of Digitization", Edward Elgar Publishing, 2013, Part IV.

2 We are aware that the public sector will probably need significant help from the private sector to digitally transform. This might lead to the increased transfer of public administration responsibilities to the private sector in the future, in particular in connection with digitalisation. When talking about the public sector or public administration, we include this kind of outsourced public task, public-private partnerships and the like.

3 A. Goldfarb, S. Greenstein and C. Tucker, "Economic Analysis of the Digital Economy", University of Chicago Press, 2015, p. 2.

4 Firstly, they are non-rival, secondly, the marginal costs of reproduction and distribution are close to zero, and thirdly, the replicate is identical to the original; see E. Brynjolfsson and A. McAfee, "The Second Machine Age", W. W. Norton & Company, 2014, p. 57 ff.

5 Paul R. Krugman, "The Age of Diminished Expectations: U.S. Economy Policy in the 1990s", MIT Press, 1990, p. 11.

6 For more detailed information on the effects and the academic dispute about the 'Solow Paradox', see our other paper, "When the sleeping giant awakes… The disruptive impact of the Zero Cost of Control phenomenon on business and society".

7 The near zero marginal costs of reproduction, for example, make it possible to offer a now digitised service or product at the same or even a better quality level too many customers in parallel and thus substantially increase output on the supplier side at the same cost level.

8 For an overview see E. Brynjolfsson, D. Rock and C. Syverson, "Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics", NBER Working Paper 24001, 2017.

1.2 Suitability of the public administration for digitalisation

"Everything a typical person can do with less of a second of thinking we can now or soon automate"[10]

We believe that we are at an inflection point after which we will see rapid adoption of advanced technology, resulting in an explosion in productivity for public bodies and organisational change. There are five reasons to support this.

1. The nature of tasks carried out by the public administration as described above

One of the main reasons lies in the nature of the tasks carried out by public administrations. At a first glance, the activities handled by individual authorities within the overall public administration appear very different.[11] However, a closer look reveals that all these very different activities have one thing in common: at their core, they're mainly about giving effect to the law by implementing it, controlling compliance with it and enforcing it – a task mainly done by way of brain and paperwork. Even in the material domains of the technical infrastructure like roads, bridges, buildings, water supply, communications, etc., and in the hard infrastructure for national defence or public order, the state usually awards contracts to the private sector and doesn't do any manufacturing itself. What distinguishes private business from the public sector is the amount of real physical or tangible goods produced by the latter. To a very high degree, the output of the public administration is not necessarily physical in nature.

Now paperwork can be digitised very easily, and new digital technologies help to 'enhance the brainwork' (i.e. the processing of huge amounts of data), and make these tasks a lot more efficient.

2. The volumes of data available to train advanced algorithms

Digitalisation, in particular machine learning and artificial intelligence, relies on huge amounts of data.[12] In the course of their own digitalisation process, business (and society as a whole) is producing huge amounts of digital data for its own purposes. The public administration is now able to use this data for its own work, and with its scale and reach can create a much larger data pool[13] than an individual business could.[14] This is one example of how the digital transformation of the private sector will act as a catalyst or enabler of transformation in the public sector. Indeed, it is only because this digital data exists that the public sector can use it to discharge its own duties.

3. Scientific research on automation

Academic research shows how digital technologies are now starting to automate a broader range of non-routine tasks in addition to those jobs we generally perceive to be subject to automation, and these kind of non-routine tasks make up a significant percentage of the work routinely conducted by public administrations.[15]

4. Pressure for change

Without digital capabilities, the public administration will soon simply not be able to govern the growing complexity in the world. A digital world will expect its public bodies to have the same level of capability.

In addition, government agencies are under continued pressure to become more efficient and deliver more with less in an environment of continuing constraints on both budgets and human resources.[16]

5. Significant resources available (if the political will exists)

Last but not least, the state has sufficient investment resources at its disposal to make a great leap forward into a digital era at any point; it just needs the political will to commit to such spending.

All these reasons combine to create an environment that will visibly change the landscape of public administration.

10 Andrew Ng, "The State of Artificial Intelligence", during an Emtech talk produced by the Massachusetts Institute of Technology's Technology Review, 2017, see https://events.technologyreview.com/video/watch/andrew-ng-stanford-state-of-ai/ [May 2018].

11 For example it covers very different areas and activities, such as public finance and taxation; legal activities and regulation; public order and security; the administration of public education and health; the provision of public infrastructure for transport, electricity, water, etc.; urban planning; national defence; immigration services; foreign affairs and international assistance; and providing information. We are aware that state activities vary from country to country, but our main focus here lies on the core element, administrative tasks.

12 This applies primarily to supervised learning.

13 If they don't have access now, they could get it any time with an amendment of the relevant law.

14 Leaving aside the big intermediary tech companies.

15 E.g. C. B. Frey and M. A. Osborne, "The Future Of Employment: How Susceptible Are Jobs To Computerisation?", Technological Forecasting and Social Change (2017), 114, 254–280; C. B. Frey and M. A. Osborne, "Technology at Work", Citi GPS Report, 2015; C. B. Frey, M. A. Osborne and C. Holmes, "Technology at Work v2.0", Citi GPS Report, 2016. For PwC's own study with similar results for clerical workers see J. Hawksworth, R. Berriman and S. Goel, Will robots really steal our jobs?, https://www.pwc.co.uk/economic-services/assets/international-impact-of-automation-feb-2018.pdf [May 2018].

16 Very vividly described with three key objectives for the HMRC in 2015 to 2016: "Maximise revenues, improve the service that we give our customers and make sustainable cost savings", see https://www.gov.uk/government/publications/hmrc-annual-report-and-accounts-2015-to-2016/hmrc-annual-report-and-accounts-2015-16-executive-summary [May 2018]. According to the 2016/17 annual report the HMRC committed to deliver GBP 1.9 billion efficiency savings until 2019/20 and simultaneously to bring in GBP 920 million in additional tax revenue, see https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/635587/HMRC_Annual_Report_and_Accounts_2016-17_web_.pdf [May 2018].

1.3. The consequences of digitalisation and disruption in the public administration

The interesting questions now are as follows: what will the wider implications of digitalisation and disruption in the public administration be, and how exactly will the development change the landscape of public administration?

Answering these questions isn't easy, but again, developments in the private sector can provide some insights and point in the direction of travel.[17] Given that in the private sector the effects on productivity and outcome described above are key, we will focus on them here as well.

Firstly, investments in digitisation in combination with automation and increased efficiency mean that we will soon witness enormous growth in productivity within the public sector.[18] But huge productivity growth isn't the same in the public sector as in the private sector. It doesn't simply result in better or cheaper products.

Sure, digitalisation of the way the law is implemented will most likely result in better, easier and cheaper services delivered and offered by the public administration, at least in the long run[19], but this is just one part of the story. If we recall the tasks of the public administration, one major aspect of the authorities' work is controlling compliance with and enforcing the law.

The new world of digital information and the significant productivity growth resulting from this will enhance the authorities' ability to control in four dimensions.[20] But it's not even just that. Once the necessary digital systems are live and running, expanding the scope of systems further and further will cost almost nothing. This means that once the initial leap is complete, we will enter into a world where the state can execute control and monitoring almost for free. To capture this special property of the future world, we use the expression 'near zero marginal cost of control', the Zero Cost of Control phenomenon for short.

Secondly, in the public administration landscape we will see an effect similar to the winner-takes-most markets or network effect in the private sector.[21]

The first government agency to acquire great knowledge and skills in the use of digital technologies will be able to perform its duties faster, better, cheaper and in greater numbers than other agencies. For instance, if revenue generation is involved, the agency will be able to generate more revenue. It can free up resources to take on other tasks from other overburdened public bodies. The agency with the best systems (and this can even be a minor one),[22] could shift the power structure of the authorities and become the most powerful over time. A development like this is even more plausible if you bear in mind that bureaucracies have an inherent tendency to centralisation[23] – which of course will also have major implications for business indirectly.

The path of this almost 'natural' evolution[24] to a truly digital public administration will lead to fewer and more centralised but stronger and more efficient government bodies with unprecedented supervision capabilities, and to fundamentally more transparent economies.

1.4. Different scope and speed around the globe

As we discussed thoroughly in our preceding paper, "When the sleeping giant awakes… The disruptive impact of the Zero Cost of Control phenomenon on business and society", this development – which is strongly driven by economic principles, technological capabilities and politico-economic interests – will unfold at widely varying speed and scope around the globe, mainly due to the different forces resisting change. Even though the many factors involved make predictions difficult, we have identified two main categories of change.

In western-style democracies and similar forms of governments, change is likely to encounter significant resistance, mainly by way of legal institutions and mechanisms like the separation of powers rules, federalism mechanisms, constitutional rights and privacy laws. This resistance might slow or even restrict the overall 'naturally evolving' transformation. The emerging societal negotiation process will create a fragmented and non-homogeneous picture. The speed and degree of the public administration's digital transformation will vary greatly in the various democratic countries – not because of technological capabilities, but because of political and societal will. In particular, countries with strong federalist mechanisms like Switzerland[25] or pronounced privacy concerns like Germany will lag behind other more centralised nations. Nonetheless, even a slowed down and somewhat restricted digital transformation will bring major changes in western-style democracies, and will fundamentally alter the way the states act and interact.

In autocracies and similar forms of governments, resistance will not be as strong. Rather, digital transformation will lend further impetus to the tendency to supervision, centralisation and the concentration of power inherent in these systems. This means that autocratic countries in general will take the lead in the process of digitally transforming the public administration.

These trends can already be observed just by looking at how individual governments are collecting, storing and using data. The first indications can already be seen in the area of tax, and they correspond with our predictions.

17 Even though from a classical standpoint the public administration is not a competitive market, meaning that findings cannot be transferred one to one, per se unrelated drivers may unfold force in a similar direction. We will come to that point later.

18 Estonia, a pioneer in the digitalisation of public administration, estimates that its X-ROAD platform alone saved 804 working years during the previous calendar year, see https://www.ria.ee/x-tee/fact/#eng [May 2018].

19 E.g. the property of identical replicate will result in services of better quality because human errors and careless mistakes are reduced and local misuse of power or corruption is prevented. More on that later.

20 The four dimensions are greater volume, greater depth, greater breadth and greater speed. For more details see our preceding paper, "When the sleeping giant awakes… The disruptive impact of the Zero Cost of Control phenomenon on business and society".

21 In the private sector this development is driven by the pursuit of profit, in the public administration by politico-economic considerations. From a politico-economic standpoint, a head of an authority does not act in the general public interest, but rather out of self-interest, in other words to wield more power.

22 Because of the possibility of scaling without mass.

23 The special characteristics of machine learning and artificial intelligence would strengthen this development even further. The government agency which serves or controls the most companies or citizens and/or completes the most tasks has the biggest access to data. It can use this to train and get the best machine learning algorithms and AI systems and further enhance its knowledge and skills, and so on.

24 For more information, why we speak of an almost 'natural' development towards transparency see our other paper, "When the sleeping giant awakes… The disruptive impact of the Zero Cost of Control phenomenon on business and society".

25 On egovernment-landkarte.ch the status of the implementation of e-government services in Switzerland is publicly tracked. For 78 services there are currently 196 technological solutions from 72 different providers listed [May 2018].

2. Tax authorities will be the first to embrace digitalisation and disruptive innovation on a large scale

"… but in this world nothing can be said to be certain, except death and taxes."[26]

2.1 Why the tax authorities?

Government bodies vary significantly across the globe. Why, of all things, would the tax authorities be the first to disrupt on a large scale? It's not just that we already observe some tax authorities heavily upgrading their armoury and starting to digitally transform (more on that in our other paper, 'Tax disruption management'). There are at least four reasons why the tax authorities will be the first civil authorities[27] to change. Other likely candidates for pole position would be law enforcement agencies or similar security authorities.

1. The tax authorities fulfil a fundamental task that forms the foundations of modern societies. Only the invention of money and writing by the Sumerians around 3000 BC made it possible to collect taxes from hundreds of thousands of people, for example, which in turn allowed the administration to establish bureaucracies and build kingdoms, and, later, nations.[28] Because taxation is so crucial for a country, major innovative advances will be seen here first,[29] since improvements in this area should yield more revenue for central authorities.

2. But taxation isn't just crucial for a country in general; tax revenue is very important for individual politicians as well. In western democracies, a politician needs legitimisation by the voters, and has to be (re-)elected. The amount of money he or she promises or is able to spend or redistribute is central to this purpose.[30] If politicians realise the potential of digitalisation to increase tax revenue, this will provide a very strong incentive for politicians to put pressure on the tax authorities to employ digital technologies to improve their performance.

3. Tax administrations are already under enormous pressure, as corporate tax rates have been falling for some time now and threaten to lower overall tax revenues. Recently, the US Tax Cuts and Jobs Act reduced the corporate tax rate from 35% to 21%, for instance. Belgium has already responded with a cut of 4 percentage points, and another cut of an additional 4 percentage points is scheduled for 2020.[31] Other countries will follow soon. Some states are already facing a severe revenue crisis.[32]

Expenditure has not declined in line with the revenue fall. Tax authorities are therefore forced to close the resulting gap. A promising possibility will be to squeeze more out of some corporate tax payers by uncovering inconsistencies in their tax narrative and closing loopholes. Another will be to increase compliance by detecting non-compliant companies and forcing them to toe the line. To achieve these objectives, the tax authorities have to expand and improve their monitoring and controlling skills. Therefore, they are increasingly turning to digital technologies.

4. Last but not least, for tax administrations it will be a lot easier than for other government bodies to employ digital technologies. This applies both to their mindset and to the subject of their work.

Tax has always been designed for mass processing. As a result, tax documents are most often standardised and consistently structured, and therefore easy to digitise. In contrast to other legal areas, applying tax regulations usually requires a more algorithmic approach, and the work sequences tend to be more 'mechanical' without the need for many bespoke interventions. This makes the area a perfect fit for digital technologies.[33]

Moreover, the tax authorities are historically more used to numbers, information technology and data analysis techniques.

2.2 Two options for a broader strategy of action

As we have shown, embracing digital technologies will soon result in a sharp increase in productivity growth and thus lead to the world of Zero Cost of Control. This leaves the tax authorities with two options for using the resulting 'productivity dividend'.

The first option would be to maintain more or less the current assessment scope and reduce their staff numbers significantly. In fact, this comes in handy because tax administrations are confronted with continuing budgetary constraints and pressure on human resources.[34] However, the necessary ad hoc reduction of staff that comes with rapid growth in productivity is, though desirable from an efficiency and public expenditure perspective, almost impossible to realise for public organisations owing to political constraints.[35]

The second option for the tax authorities would be to reduce the cost level only slightly, but instead use the productivity dividend to vastly increase the operational scope of their activities.[36] A look at examples across the globe unsurprisingly reveals that the second option predominates. The tax authorities are stepping up numbers of assessments, taking on new responsibilities and unfolding activities in new areas.

This is one of the main reasons why the Zero Cost of Control phenomenon will finally and almost inevitably, result in nearly completely transparent companies – provided that, at least, resistance does not slow down or restrict the development. It's important to understand that the development towards transparency is not necessarily driven by a political will. It is more likely to come as by-product of the digital transformation process. This is another reason why we speak of an almost 'natural' evolution towards transparency.

26 Benjamin Franklin to Jean-Baptiste Leroy in a letter, 1789.

27 Military and intelligence agencies will probably be ahead.

28 C. Adams, "For Good and Evil: The Impact of Taxes On The Course Of Civilization", 2. Ed., Madison Books, 2001, p. 2. For more details see W. N. Goetzmann, "Money Changes Everything – How Finance Made Civilization Possible", Princeton University Press, 2016. C. Adams, "For Good and Evil: The Impact of Taxes On The Course Of Civilization", 2. Ed., Madison Books, 2001, p. 2. For more details see W. N. Goetzmann, "Money Changes Everything – How Finance Made Civilization Possible", Princeton University Press, 2016.

29 From this perspective, unsurprisingly, the electronic tax declaration is seen as the first and most successful application of electronic administration in Switzerland, see "Nationale E-Government-Studie 2017", https://www.egovernment.ch/index.php/download_file/force/1295/3343/ [May 2018]. The same applies, for example, to Estonia.

30 For more on that view, see e.g. D. A. Wittmann and B. R. Weingast, "The Oxford Handbook of Political Economy", Oxford Handbooks, 2008.

31 Stay up to date with the tax reform with PwC Belgium: https://www.pwc.be/en/news-publications/news/tax-reform.html [May 2018].

32 American states face a revenue crisis – The wisdom of Mr. Micawber, The Economist, 07.04.2018. American states face a revenue crisis – The wisdom of Mr. Micawber, The Economist, 07.04.2018.

33 Here lies the main difference to and the disadvantage of the security authorities: they usually collect and handle a lot more unstructured or dirty data.

34 Though in average their overall budgets have increased lately, they did not, however, compared to growing GDP and new responsibilities. Hence, in relative terms, the majority of the tax authorities face a declining budget and have to cope with reduced staff numbers and the general task to deliver more with less, see OECD (2017), "Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies", OECD Publishing, p. 120.

35 Vividly illustrated already by D. A. Schon, "The blindness system", The Public Interest, Vol. 18, 1970, p. 25–38.

36 The tax authorities have another very specific incentive. Increasing their operational scope means increasing revenue as well.

2.3.Examples of digital transformation in government agencies

As promised, we will provide you with some examples of digital transformation in the area of tax to support our claim. But note that we are standing at an inflection point: the authorities are just starting to invest heavily, and only the very first results are now being observed. The examples are just the beginning, and should only point in the overall direction of travel.

As predicted above, the tax authorities in second-world countries are already ahead in terms of using digital technology. This might be due the fact that they have more to win and less to lose. For one thing, their tax gap is bigger and they lose a lot of revenue to corruption; for another thing, they don't, under the current climate, risk a complex and lengthy societal negotiation process if they increase their scope of supervision.

1. Most organisations or individuals handling cash payments in Russia have been obliged to upgrade their cash registers with Cash Register Equipment[37] since July 2017 already (the remainder have until July 2018 to do so). The upgraded cash registers create an electronic cash receipt for every payment and send it to a fiscal data operation unit run by the tax authorities. It is reported that the Federal Tax Service of Russia receives real-time data from more the 2.5 million points of sale and processes more than 1 billion electronic invoices every quarter.[38]

Chile and Mexico are heading in the same direction. Chile, a pioneer in e-invoicing, made its electronic invoicing system mandatory for all businesses in 2014, and it's estimated that by 2017 a major part of businesses were using the system.[39] Since Mexico made e-invoicing mandatory, it is reported to have brought more than 4.2 million businesses into the formal economy.[40]

But making sure that taxes are paid is just one side of the coin. Along the way, the tax authorities receive real-time information on the volume of trade and purchasing power as well. They also could analyse the general structure of trade, follow goods along the value chain and monitor prices, for example. Putting this together with other sources they will obtain a comprehensive picture of the country's overall economic activity.

2. In the United Kingdom, the HMRC[41] started by licensing a tool called COSAIN and later had developed their own system, called Connect. This has involved overall investment in excess of GBP 100 million over a number of years.[42] The purpose of this platform is to gather social media data and publicly available website data. For example, the system is able to monitor the e-commerce sector by collecting and comparing data from sites such as Craigslist, eBay and Airbnb, and link it to social media data to monitor and identify undeclared transactions. It also generates profiles which can be used to monitor trends within a geographic area or specific business sector.[43]

3. The Australian Taxation office has obtained access to information collected in the Australian Transaction Reports and Analysis Centre (AUSTRAC), which is Australia's financial intelligence unit with regulatory responsibility for anti-money laundering and counterterrorism financing. This allows them, for example, to trace funds flowing to drivers from overseas to local banks and thus to identify unregistered business activities.[44] As a result, the tax authorities wrote to 60,000 Uber and other ride-sharing drivers and asked them to get their tax affairs in order.[45]

But again, these examples serve only as indication of the beginning of a more general development that we are witnessing right now, and which will quite suddenly take off. This leads us to the final question: *what does all this actually mean for me as a business person?*

[37] CRE, a fiscal storage device.

[38] PwC Russia, Tax Flash Report, Issue No. 66, see https://www.pwc.ru/en/tax-consulting-services/assets/legislation/tax-flash-report-2016-66-eng.pdf [May 2018]; OECD (2017), "Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies", OECD Publishing, p. 64.

[39] OECD (2017), "Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies", OECD Publishing, p. 60.

[40] OECD (2017), "Technology Tools to Tackle Tax Evasion and Tax Fraud", OECD Publishing, p. 52.

[41] Her Majesty's Revenue and Customs.

[42] L. Suter, "Taxman unleashes its 'snooper computer': what information does it have on you?", The Telegraph, 7.1.2017, see https://www.telegraph.co.uk/tax/return/taxman-unleashes-snooper-computer-information-does-have [May 2018].

[43] OECD (2017), "Technology Tools to Tackle Tax Evasion and Tax Fraud", OECD Publishing, p. 25; see also V. Houlder, "Ten ways HMRC can tell if you're a tax cheat", Financial Times, 19.12.2017, https://www.ft.com/content/0640f6ac-5ce9-11e7-9bc8-8055f264aa8b [May 2018].

[44] OECD (2017), "Technology Tools to Tackle Tax Evasion and Tax Fraud", OECD Publishing, p. 24.

[45] N. Khadem, "ATO writes to 60,000 Uber and other ride-sharing drivers asking them to get tax affairs in order", The Sydney Morning Herald, 30.6.2017, see https://www.smh.com.au/business/ato-writes-to-60000-uber-and-other-ridesharing-drivers-asking-them-to-register-for-gst-20170629-gx12xb.html [May 2018].

3. Why and when is this relevant to me?

The Zero Cost of Control phenomenon we have described and the rapidly changing landscape of public administration will have a strong and very specific impact on the tax capabilities[46] of your business.

As suggested before, tax administrations all over the world have already started to collect a lot more data, increase their operational capabilities, and expand collaboration with other bodies, sharing data and capabilities.

Conveniently, the amount of data in digital formats is increasing exponentially as companies pursue their own digital transformation. As they do this, they establish new data-driven technologies and applications like the industrial Internet of Things or cloud computing on a large scale.[47] Just think of the amount and (fiscal) value of data produced in real time by industrial analytics robotic inspections systems or by making an entire production smart, for example.[48]

The resulting move towards overall transparency[49] and the new technological capabilities will deliver some government agencies a profoundly accurate picture of your company, your activities and your value chain. At some point in the not-so-distant future, they might know your company better than you do today.

To fully understand the implications, we have to distinguish between the short-term and long-term consequences of digitally transformed tax authorities.

3.1 Long-term consequences

We consider ourselves realistic optimists, and therefore believe that in the long run, these changes will result in the transparent and predictable administration of tax legislation – something that public bodies and taxpayers alike would value. A data-driven tax authority could lead to an administration offering better and cheaper services to companies, making supervision of compliance less invasive.[50]

A technologically enhanced tax administration could provide a higher degree of tax certainty and predictability, minimising the risk of unexpected outcomes of supervision. Automation will reduce individual errors in manual assessments by tax authorities, prevent corruption[51] and improve the quality of tax statements. A more efficient and effective tax administration could also reduce the costs of compliance significantly and minimise the burdens on corporate taxpayers.[52] At the same time, this could help companies to reduce the costs of internal risk management, as well as helping to prevent individual fraud by employees.

But first we are going to enter a transitional phase that will be challenging for everybody involved.

3.2 Short-term consequences: the transitional phase

For business, entering the transitional phase means embarking on a bumpy ride of uncertainty and potentially full of surprises. With more information, and as increased operational capabilities are available the tax authorities will suddenly gain new insights into your business. Out of the blue, all the inconsistencies of your tax narrative will come to light – inconsistencies you probably weren't even aware of. To pick just a random example: if you're a multinational corporation, think of one of your products that's shipped worldwide. Then think how many brokers might have classified this particular product in how many different tariff classifications around the globe. As soon as the tax and customs authorities all over the world start to exchange information and compare the tariff classifications for each product on a fully automated basis, these kinds of inconsistencies will pop up quickly and might lead to significant penalties.

A particularly important challenge during the transitional phase will be the shift from the old, analogue tax narrative to the new, digital one. Tax administrations will raise questions like: "Why was there no reporting in the past and all of a sudden there is reporting?"[53]

3.3 What can I do about it?

When looking at how you can prepare for this new world of tax, we assume two primary objectives for the tax function of many private organisations. The first is to achieve a high degree of planning security: to avoid any unexpected surprises uncovered by the tax authorities entailing unforeseen costs, legal disputes and a threat to the company's reputation. The second is to ensure maximum fiscal efficiency, in other words to reduce the time and effort it takes to be compliant with the law and avoid paying more taxes than you are obliged to.

Now what do I have to consider if I want to achieve these two goals in a quickly changing tax environment?

Transitional phase

1. Preserving planning security and reducing unwanted surprises entailing reputational threats during the transitional phase will be the toughest challenge. The first vital step is to quickly get your tax capability on the same data-driven level at which the authorities will be operating. The key question for companies here is: Will we understand the data before the tax authorities do? As soon as you speak the same language and gain the same insights, the second step will be to adapt, in other words to reduce the inconsistencies and provide an appropriate tax narrative.

Here it's important to understand that the modus operandi of interaction will shift as well, and then to prepare for that. Whereas until now companies have been able to operate in a reactive way, i.e. to develop a narrative for historic transactions and narrow cases, they will soon have to switch into proactive mode and provide an all-embracing (global) narrative in real time.

At the same time, international businesses will be able to contrast the mainly national (data-driven) perspective of the tax administrations with their (data-driven) global perspective. While the tax authorities can compare the behaviour of many companies within their jurisdiction, a global company can compare the behaviour of many tax authorities worldwide. This should open up a new data-driven line of justification for your activities from a taxation perspective.

[46] We define tax capabilities as skills that enable a company to ensure it complies with tax legislation. These capabilities may be in the tax function itself, but might also be in other functions within the organisation (such as finance, controlling, compliance, logistics and so on).

[47] Platforms like Siemens' Mindsphere or General Electric's Predix collect all kinds of industrial data like sensor, real-time telemetric, time series and geographical data, as well as asset performance or operations performance data. They aim to digitise the whole production cycle and create a model of the entire value chain. In addition, they are storing all the information in the cloud, always ready to get queried.

[48] For an illustration see M. Annunziata and P. C. Evans, "The Industrial Internet@Work", GE Report, 2013.

[49] For example the OECD already regards full tax transparency as most effective tool to fight tax evasion and raise revenues, see http://www.oecd.org/tax/transparency/about-the-global-forum [May 2018].

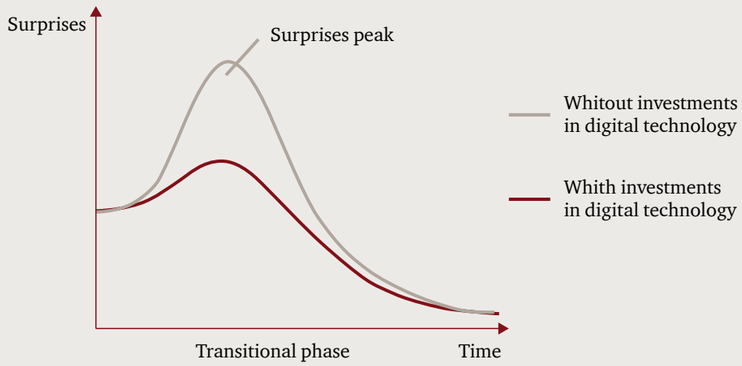
[50] For more information see our other paper "Tax disruption management".

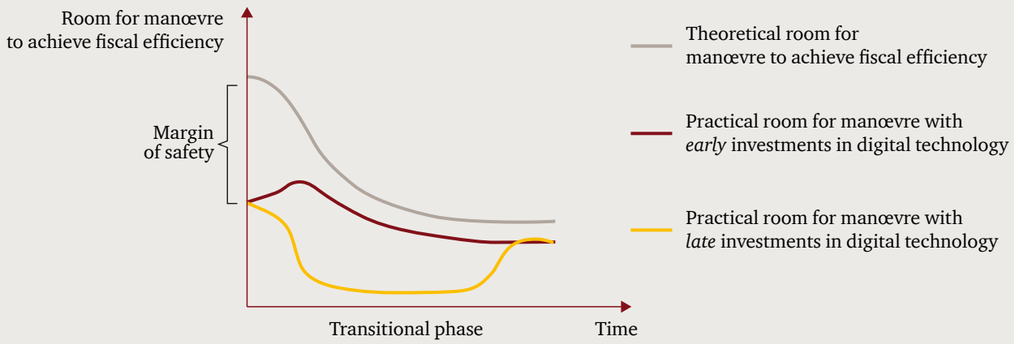
[51] The likelihood of incidents like the ones the South African Revenue Service (SARS) is currently dealing with should decline in general; see J. White, "Can South Africa's tax authority rescue its credibility?", International Tax Review, 29.3.2018.

[52] The Tax Foundation estimated the costs of tax compliance in 2016 in the US alone at USD 409 billion, or 3.4 million people working the whole year just for that purpose; see S. A. Hodge, "The Compliance Costs of IRS Regulations", Tax Foundation Fiscal Fact No. 512, 2016.

[53] Compare the interview D. O'Donnell, head of the large business and international (LB&I) division at the IRS, gave the International Tax Review, IRS Special: Running the risk, 21.3.2018, see http://www.internationaltaxreview.com/Article/3795448/IRS-Special-Digging-for-data-with-Doug-ODonnell.html [May 2018].

Number of surprises in the transitional phase





2. To transfer your tax capability in the new digital world requires substantial investments in data preparation, technology and employee training. But even in the short term this is likely to pay off. What would happen if you missed the public transformation? If you're not prepared for the questions that will soon be asked by a data-driven tax authority, this will result in substantial costs as well. Answering questions, preparing documentation, getting legal advice, resolving legal disputes and repairing reputational damage – all of this expensive. And these dispute costs can quickly outrun the alternative investment costs. To make matters worse, the dispute costs are not predictable, and they are lost for good.

On top of this, you run the risk of paying more taxes than you should. A digital tax authority might argue on a data-driven level for a tax liability where there is none, and you simply might not be able to challenge their ruling in the same language if you have not made this investment.

Having said all this, sustainable investments in the digital transformation of your tax capability might turn out to be reasonable – even from the sole perspective of fiscal efficiency.

Long-term perspective

1. From a long-term angle, preserving planning security might not be an issue any more. The tax administrations will take over this job. This is one of the main advantages of the future development as described above. Once the systems are up and running and taxes are paid in real time, it will be pretty obvious when and how taxes are paid. But to get their systems working, we expect tax authorities to oblige companies to provide data in the right way; to install APIs and other corresponding technology to get the data they need. This means that at some point in the not-so-distant future, companies will have to update their tax capability anyway.

2. With regard to fiscal efficiency, the tax authorities will unfortunately not take over the job. They'll pursue other interests. But even though in the future, transparent real-time tax world the room for manoeuvre will be significantly smaller, it will still be there. To remain capable of action and sustainably exploit the space that's left, companies must fully understand their data and the data-driven perspective of the tax authorities. That again is only possible if you're running a digitally enhanced tax function utilising the processing power of machine learning, AI-based systems, advanced analytics and the like. A digitally enhanced tax function will allow you to exploit the (remaining) room for manoeuvre more efficiently and with less risk than would be possible in the old world.

A digitally enhanced tax function comes with a very nice side effect: in the long run, your tax function will also be a lot more efficient, so it will be a lot cheaper than it is today.

Finally, we can dedicate ourselves to the very last question: *when is the time for action?*

[54] https://www.gov.uk/government/publications/hmrc-annual-report-and-accounts-2015-to-2016/hmrc-annual-report-and-accounts-2015-16-executive-summary [May 2018].

[55] HMRC Annual Report and Accounts 2015-16, p. R39, see https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/539608/HMRC_Annual_Report_and_Accounts_2015-16-web.pdf [May 2018].

[56] https://tweakers.net/nieuws/103172/belastingdienst-reorganiseert-maar-neemt-1500-mensen-aan-voor-data-analyse.html [May 2018].[57] For example the OECD already regards full tax transparency as most effective tool to fight tax evasion and raise revenues, see http://www.oecd.org/tax/transparency/about-the-global-forum [May 2018].

[57] Couple these benefits to the fact that, as with any new capability, data-driven tax capabilities take time to develop, and that these skills are currently in scarce supply, and logic would dictate that not only should you invest to ensure that you remain compliant, but that you invest now to maximise the available additional benefits from a tax perspective.

3.4 Why should I act now?

The great difference by comparison with analogue times is that it's now almost impossible to grow with the task and refine over time. Instead, digital times are disruptive. Investments are made and innovations are developed mostly out of sight. And suddenly they come to light and everything is different.

The new digital tax landscape is no exception. Tax administrations will invest in digital technologies (we expect they're doing so even as you read this paper), at one point they will turn their systems on, and suddenly their view of your company will be very different. We call it the eureka moment of tax. And it's very hard to catch.

We contest that the eureka moment of tax is closer than you think, because the tax authorities have already started to invest heavily. We observe a lot of indications supporting this claim.

On the one hand, we can already witness the first new capabilities of the tax authorities out 'in the wild'. Just take a closer look the examples of the Russian, Chilean, Mexican, Australian or British tax authorities we provided above and think of the possibilities arising from that collected data. These kinds of examples are an indicator of a broader and more general development.

On the other hand, and to support our hypothesis, we took a closer look at the recent resource allocation of the tax authorities.

Just to give a small example: the British tax authority (HMRC) announced a ten-year digital transformation plan to transform 'into one of the most digitally advanced tax administrations in the world'.[54] Their current investment plan contains expenditures on digital transformation in the amount of GBP 332m in 2016/17, GBP 221m in 2017/18, GBP 194m in 2018/19, GBP 172m in 2019/20 and GBP 134m in 2020/21. This adds up to an investment of more than GBP 1 billion over the next five years, just in digital technologies. Not even included are the accompanying investment costs for estates, supporting compliance and so on. The overall costs of the transformation process add up to more than GBP 2 billion in five years.[55] How does your investment in your tax function compare to this?

Another example is provided by the Netherlands. Just after admitting that they had wasted EUR 203 million on a failed automation project, the tax authorities announced that they would create more than 1,500 new jobs for data scientists.[56]

This kind of evidence suggests that our earlier examples indeed just show the early adopters and the tip of the iceberg. Most tax authorities are right now only somewhere in the middle or at the beginning of the investment cycle. The implementation phase will start in the not-so-distant future, and will be clearly visible.

The really important thing to understand is that the time for action is now.

Of course, some may suggest that with technology improving rapidly, waiting to invest might be the smarter solution. For one thing, unfortunately, the change we outline here has much more implications than just a technology product or process that you can buy one day 'off the shelf'. It entails changes in culture, mindset and technological capabilities. If you want to understand your own data, you must develop this kind of skill set internally, and cannot simply outsource it to a third party. For another thing, if you wait, you run the risk of missing the 'optimum' time to invest. Similar to common sayings about the stock market, without insider information there is no way to really time this change – it's about time in the market, not timing the market.

Investing in new tax capabilities today is the only way to keep pace with this development and ensure that you can continue to interact with authorities at the same level as you do today.[57] Investment will help you to mitigate the 'surprise bump' we outlined above as new capabilities are 'turned on' by the authorities and they suddenly understand your business in much more detail. Additional benefits are also available, as a data-driven tax response will enable you to maximise the available tax opportunities in this new digital landscape of tax.

Invest now, invest well, and ensure that the tax capabilities of your business help you to withstand the heat of the coming disruption.

We will be investigating which capabilities you need and how to invest in our subsequent paper: 'Tax disruption management'.

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