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The Robotisation of Tax Administration

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Abstract— **Developments over the last decade in the use of AI in tax administration have been nothing short of outstanding. Not only are taxpayers increasingly making use of automated systems in tax compliance, but perhaps more importantly, tax enforcement is increasingly reliant on new technologies as compliance-enhancing and fraud-prevention tools. However, whilst the use of AI brings very significant advantages to both the efficiency and the equity of tax systems, it also carries important risks. This paper identifies the development of a new AI fallacy within the tax policy sphere, namely that of unconstrained success: that the use of AI in tax compliance and enforcement can compensate for the deficiencies of the tax law. This paper considers the rationale behind the development of this fallacy, in particular the political and institutional dynamics involved in the approval of new tax legislation. It concludes that, maximising the benefits of the use of AI in tax compliance and enforcement requires departure from this fallacy, and the recognition of the wider dynamics of the tax policy-administration symbiosis.**

I. Introduction

As it is often the case, it all started with tax law. Whilst today AI is used in many areas of law enforcement [1], the earliest best-known example of this use was the Taxman [2], an early-days AI system applied to corporate tax law enforcement, and sometimes referred to as "the father of AI and law" [3]. The use of AI-based technologies in tax compliance and enforcement, therefore, dates back to the 1970s [4], in the initial stages of AI, when tax law was regarded as particularly suitable for exploring its possibilities. This initial perception continued for the next decades, and between the 1970s and the 1990s, many more AI solutions were developed, focussing specifically on tax law[5].

It is undeniable, however, that the latest decade has been a time of unprecedented change in the use of AI in tax administration [6]. Not only are taxpayers increasingly making use of automated systems in tax compliance [7]; but perhaps more importantly, tax administrations are also increasingly reliant on new technologies as compliance-enhancing tools [8]. A recent OECD survey indicated that, in the 59 countries surveyed, more than 90 percent of business taxpayers were filing their returns electronically; 50 percent of tax administrations used digital assistants such as "chatbots"; more than 80 percent were using risk management analytical tools; and close to 75 percent used cutting-edge big data techniques [9]. Such rapid technological growth –which, to a large extent, mirrors the general growth in the use of AI in the public sphere [10] – is, however, bound to raise concerns. Although, initially anxieties over the developments in robotics focussed primarily on their impact on tax revenues [11], and their impact on tax administrations had gone largely unnoticed, this has changed in recent years with increased attention given to their (unintended) consequences.

In what follows, we provide a critical assessment of the impact of AI and robotics in tax administration. In Section II, we consider the extraordinary growth of AI in tax administrations, and their many advantages as compliance-enhancement tools. In Section III, drawing insights from public law and regulatory theory, we discuss the risks of using AI in tax enforcement, both from a generally regulatory perspective, and from a tax law-specific perspective. We then identify a new AI fallacy, namely that of unconstrained success, and consider the wider political and institutional dynamics that lead to its development. We conclude, in Section IV, that: (*i*) whilst the use of AI in tax administration has (very) significant advantages, it carries significant risks and limitations, and in particular it cannot compensate for deficient legal design; and (*ii*) maximising the benefits of the use of AI in tax administration requires the recognition of symbiotic nature of tax policy and tax administration.

II. The Growth of AI in Tax Administration

Whilst AI systems have been used for tax administration purposes since the 1970s, until recently, their usage was relatively restricted to specific functions, in a limited number of countries. The generalised use of AI at a global scale arguably started in the 1980s, with the digitalisation of tax compliance, such as electronic invoices and e-tax returns, but it was only in the 2010s that the use of sophisticated AI by tax administrations spread [12].

The use of AI in tax administration is now, not only pervasive but also diverse. Whilst there are many different AI tools in use globally, some of the most significant – and controversial – can be divided into three main types, as follows: risk assessment tools, real-time technology, and compliance assistance technology. The first two types can be broadly characterised as negative incentives to compliance, or anti-fraud mechanisms, the third as positive incentives to tax compliance, or compliance-enhancing mechanisms.

Risk assessment analytical tools have spread throughout the world [13]. Some of these tools focus on identification of high-risk taxpayers, including through big data sourcing and profiling, such as the Italian's FALCO system, or the Dutch XENON robot [14]. Others are aimed at improving the effectiveness oftax audits, known as computer-assisted audit tools and techniques (CAATTs), which have been implemented by several countries, including Australia, Finland, Germany, Indonesia and the US [15]. Further proposals concerning the application of AI to tackle international tax

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avoidance [16], and the development of AI systems that draws on big data to detect behaviour that may be hard for human inspectors to spot [17], have also been put forward.

One of the most promising – but also more intrusive – AI developments is real-time technology: the electronic matching-up of invoices in a data-warehouse, in real-time, so as to identify fraud and/or prevent it from ever taking place [18]. The process of matching-up invoices was not new, and indeed had been in place in South Korea since 1976, but AI proved crucial inovercoming running administrative and compliance costs [19]. In 2010, Israel successfully implemented a new online system, under which all invoice matching would be done electronically at a massive data- warehouse, followed by Portugal and Russia [20], and more recently Slovenia [21].

Compliance assistance technology is another area of significant growth in AI usage. Robots capable of performing tax compliance tasks, such as Turbotax, have already been developing for some years [22], and are likely to increase in the coming years [23]. Whilst tax compliance AI is often provided by private entities, its usage has been often encouraged by some tax administrations, with governments increasingly rely on AI to help the public understand and apply the law [24]. More recently, new AI-based predictors of tax law cases havealso started appearing on the market, and increasingly being used by both taxpayers and tax administrations alike [25].

This outstanding growth of AI in tax administration can be attributed to a range of factors. First, the financial crisis over a decade ago sparked a period of renewed focus on tackling tax fraud, and non-compliance more generally. When faced with public finance pressures – namely the need to increase revenues, and minimise expenditure – many countries felt that improving tax enforcement and compliance was a politically easier – and importantly, also fairer – way of increasing revenues [26].

Second, human resources are expensive, and tax administrations are often underfunded [27]. Pressure to improve tax compliance rates, is often coupled with drive to apply a cost-benefit analysis to tax administration, and an evaluation of enforcement elasticities: which administrative actions would result in the most revenue, at the lowest possible cost [28]. This approach to tax enforcement had some – perhaps unforeseen – effects, namely the development of a selective approach to tax enforcement, solely based on a revenue maximisation criterion [29]; but it also gave a strong impetus to AI implementation. An effective tool to increase revenues, with (comparatively) small administrative costs. Indeed, the probability of job automation for tax auditors and revenue agents has been estimated at 93 percent [30]

Third, AI systems have proved extremely effective as compliance enhancing tools [31]. Not only are they effective in combating fraud – including newer practices themselves enabled by the digital economy [32] – but they are also effective in decreasing other forms of non-compliance, such as negligence or error [33]. Various new studies applying behavioural science to tax enforcement have shown how a significant part of non-compliance is non-intentional, so that removal of compliance frictions or small compliance nudges can have a significant impact [34]. It is therefore unspringing that, by facilitating compliance, AI can have a very significant impact on enforcement.

Finally, there is now also evidence of non-negligible spillover effects. In particular, well-designed AI can decrease two of the key downsides of tax administrative discretion [35], namely susceptibility to human cognitive biases and to noise, and opportunities for corruption. There is now consistent evidence to indicate that both cognitive biases and noise – the unwanted variability in judgments – are pervasive in administrative adjudication [36]. AI eliminate noise, which is a source of unequal treatment, and can counteract biases, if carefully designed. There is also evidence that AI decreases the scope for corruption [37].

Overall, the use of AI in tax administration is likely to be a key positive factor in revenue mobilisation going forward –to some extent perhaps even offsetting the potential impact of automation on labour displacement [38]. Whilst the advantages are overwhelming, however, it is critical, to be mindful not only of the potential risks of the use of AI by tax administrations, but also its limitations.

III. The Risks of Using AI in Tax Administration

There is now a growing literature on the ethics and regulation of AI, particularly in the context of its use by government agencies [39]. New technologies and innovation create, by nature, regulatory challenges, particularly in the context of traditional and reactive regulatory frameworks [40]. Regulating AI is particularly challenging, however, not just due to the speed of the changes at stake, but because of their pervasiveness and the unforeseeability of future AI applications [41]. It is unsurprising, therefore, that significant concerns have been raise as regards the use of AI. Some of these concerns apply generally to the use of AI both by private and government entities, others concern specifically the use of AI in tax administration.

General concerns as regards AI can be broadly divided into three types. First, there are fears vis-a-vis the impact of AI on discrimination and inequality. Whilst AI can correct human biases and noise if well-designed [42], there is now strong evidence that many algorithms not only entrench the biases of its (human) designers, but augment them [43]. AI is often trained to identify correlations between characteristics and outcomes, using those correlations to predict future outcomes [44]. The problem is that correlation is not causation, and inferring causation from mere correlation can often lead to discrimination of specific groups, such as women or racial minorities [45]. In tax administration, risk assessment tools are particularly susceptible to these profiling problems [46], as the recent Dutch scandal demonstrates [47]. Over the last decade, over 26,000 Dutch families were wrongly accused of fraud, after being singled-out by AI designed to detect large-scale fraud; more than half had an immigrant or vulnerable background. The Government resigned following a parliamentary report on the matter, but tax authorities remained largely unaccountable [48].

Second, there are also significant concerns regarding privacy rights, the management of big data, and the lack of legal remedies against AI. Some AI tools are extremely intrusive. They collect information from a variety of courses, including internet monitoring and communications monitoring, raising concerns over the respect for the right to privacy (Article 7 of the European Charter of Fundamental Rights); and based on that data, they predict future behaviour, arguably in violation of the right to be forgotten (Article 17 of the General Data

Protection Regulation) [49]. Lack of due process and appeal of decisions or predictions made by AI is considerably worsened by humans' tendency to rely more on those decisions than on decisions made by humans, and thus a higher reluctance to challenge them [50]. In tax administration, real-time technology raises particular concerns in this regard. AI monitoring all transactions in real-time, has information on consumption habits of every individual in a given country, at any given time. From this information much can be inferred about the private life of those individuals, which is problematic not only in the context of autocratic regimes, but also of countries were cyber security is less strong and can be hacked by organised crime groups.

Finally, there are concerns about what is known as the 'digital divide', namely the consequences of increased robotisation of life on vulnerable groups, such as the elderly, who may lack the necessary skills or means to keep up with technological developments. For most – young, higher-income, higher-educated, tech-savvy, individuals – AI can be a convenient alternative to bureaucracy; but for the less tech-savvy elderly, or for those who lack the income to access digital services, or the language skills to understand them, the robotisation of life can have dehumanising effects [51]. Tax compliance technology is particularly susceptible to these risks, and there is already evidence of divides emerging in countries, like the US, where compliance AI has been used the most [52].In addition to the above – now well-documented – risks, it is also importantto consider the limitations of AI, what AI can and cannot do. This is something that, as opposed to the regulation and ethical consideration of AI, has received little or no attention in legal circles. The outstanding developments in AI use in the lastdecade has resulted in the subtle development of a new techno-fallacy [53], namely that of unconstrained success, or AI as the magic bullet. In taxation, this fallacy manifests itself in the growing belief that implementation of AI by tax administration can, on its own, solve the problem of tax non-compliance, and that tax administration can somehow compensate for the limitations of tax policy and legislation. Evidence of this approach is now widespread. In the US, the use of automated legal guidance by tax authorities has been designated as the "simplexity" approach: complex law presented as though it is simple, without actually engaging in simplification of the underlying law [54]; in African countries, the drive to combat tax fraud has concentrated primarily on implementation of administrative measures that rely to a large extent on AI, with limited or no law reform [55]. Yet, as the African example demonstrates, although AI can bring significant advantages, it cannot *de facto* compensate for a deficient tax law.

How did this fallacy develop? Certainly, it can be partly explained by significant advantages of AI usage, and its proven track-record on compliance enhancement. Not all can be explained by its undeniable advantages, however – part of the explanation lies with the very real political dynamics of tax reforms. In essence, tax law reform is hard [56].

Approving new tax law is dependent upon lengthy legal procedures, often requiring qualified majorities that are premised on broad political consensus. Yet, consensus is often difficult to achieve. Not only do tax law reforms tend to have high political salience [57] – voters care about the outcome – but every reform will have losers, who, as opposed to winners, are usually politically loud and easily identified [58]. The political economy of taxation means that, throughout history, many elections have been lost or won as a direct result of failed tax law reforms [59]. This, together with institutional biases, such as path dependency, will often create legal entrenchment – the long-term persistence of legislation that has been associated with ineffective and obsolete laws [60].

On the contrary, implementation of new tax AI does not usually require lengthy legislative procedures – or often, even new legislation, thus often bypassing the need for legal reform. Perhaps surprisingly, the introduction of even the most intrusive of AI tools, such as real-time technology, has so far had very limited political salience, and even more limited public opposition. Very few people even know about it, let alone care about its risks; and, of course, it has many advantages. It is therefore easy to convince yourself that, actually, AI will resolve all your problems, and you do not really need tax law reform any way [61]. Coping with disappointment and other is negative emotions is, after all, one of the most common causes of motivated reasoning [62]. Except, of course, you do actually need it.

IV. Conclusion

The robotics revolution has firmly arrived to tax administration. The advantages are undeniable: if done right, AI can increase both the efficiency and equity of our tax systems; it is not, however, without risks or limitations. Whilst its impact on fundamental rights, ethics and regulation has been widely acknowledged, its effects on legal entrenchment, and maintenance of ineffective laws, have not so far been considered. This paper identifies a new AI fallacy, namely that of unconstrained success, and provides a rationale for its development. Whilst the particular difficulties in tax law reform present fertile ground for its development, it is unlikely that the fallacy is restricted to this area of the legal system. Rather, the likelihood is that it is now present, to a smaller or larger extent, in multiple of law – the higher the existing levels of legal entrenchment, the most likely it is that the implementation of AI will entrench the law further.

In taxation, regardless of the difficulties in legal reform, it would be unwise to put all our reform eggs in the AI basket. Ultimately, maximising the benefits of the use of AI in tax administration requires recognitionof the wider dynamics of the tax policy-administration symbiosis [63]. Although they can bring many advantages, compliance-enhancing measures, such as new AI tools, are at their most effective when adopted in conjunction with a situational crime prevention approach to legal design: a legal system that has been designed to minimise tax non-compliance [64]. Tempting as it is to think otherwise, tax law reform remains a critical element of increasing efficiency and fairness in our tax systems – and not even robots can save you.

References

[1] D. Freeman Engstrom et al, *Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies*, Report Submitted to the Administrative Conference of The United States, February 2020.

[2] L. McCarthy, 'Reflections on "Taxman": An Experiment in Artificial Intelligence and Legal Reasoning' (1977) *Harvard Law Review* 90(5), 837-893.

[3] R. Susskind, 'Pragmatism and Purism in Artificial Intelligence' (1989)

AI in Society 3(1), 29.

[4] B. Kuzniacki, 'The Artificial Intelligence Tax Treaty Assistant: Decoding the Principal Purpose Test' (2018) *Bulletin for International Taxation* 72(9).

[5] B. Kuzniacki, 'The Artificial Intelligence Tax Treaty Assistant: Decoding the Principal Purpose Test' (2018) *Bulletin for International Taxation* 72(9).

[6] M.A. Grau Ruiz, "Fiscal Transformations due to AI and Robotization: Where Do Recent Changes in Tax Administrations, Procedures And Legal Systems Lead Us?" (2021) *Northwestern Journal of Technology and Intellectual Property* 19.

[7] S. Morse, 'When Will a Tax Compliance Robot Follow the Law?' (2019) *Ohio State Technology Journal* 16, 278; and R. Mock and N. Shurtz, 'The Turbo Tax Defense' (2014) *Florida Tax Review* 15, 443; and J.D. Blank and L. Osofsky, 'Automated Legal Guidance' (2021) *Cornell Law Review* 106.

[8] OECD, *Tax Administration 2019: Comparative Information on OECD and Other Advanced and Emerging Economies* (Paris: OECD Publishing, 2019).

[9] OECD, *Tax Administrations Continue to Accelerate Their Digital Transformation* (September 15, 2021), https://www.oecd.org/tax/forum-on-tax-administration/news/tax-administrations-continue-to-accelerate-their-digital-transformation.htm.

[10] R. Calo and D.K. Citron, "The Automated Administrative State: A Crisis of Legitimacy" (2021) *Emory Law Journal* 70, 797.

[11] R. de la Feria and A. Grau Ruiz, "Taxing Robots" in A. Grau (ed), *Interactive Robotics: Legal, Ethical, Social and Economic Aspects* (Springer Nature, 2022), Ch 17.

[12] OECD, *Unlocking the Digital Economy – A guide to implementing application programming interfaces in Government* (Paris: OECD Publishing, 2019).

[13] OECD, *Tax Compliance by Design: Achieving Improved Compliance by Adopting A System Perspective* (OECD Publishing, 2014).

[14] T. Ehrke-Rabel, "Big Data in Tax Collection and Enforcement" in W. Haslehner et al (eds.), *Tax and the Digital Economy* (Kluwer, 2019), 283-334.

[15] A. Darono & D. Ardianto, 'The use of CAATTs in tax audits – lessons from some international practices' (2016) *eJournal of Tax Research* 14(2), 506-526.

[16] B. Kuzniacki, 'The Artificial Intelligence Tax Treaty Assistant: Decoding the Principal Purpose Test' (2018) *Bulletin for International Taxation* 72(9).

[17] S. Chen, 'China prepares to unleash artificial intelligence to catch tax cheats', *South China Morning Post*, 14 December 2019.

[18] R.T. Ainsworth, 'Refund Fraud? Real-Time Solution! Digital Security Borrowed from the VAT (Brazil, Quebec & Belgium)', (2012) *Boston University School of Law Working Paper* 12-15. A technology has the potential for significant applications in taxation, beyond tax administration, see R. de la Feria and A. Swistak, "Designing a Progressive VAT", 2022, mimeo.

[19] R. Krever, 'Combating VAT Fraud: Lessons from Korea' (2014) *British Tax Review* 3, 329-341.

[20] C. Giles, 'Russia's role in producing the taxman of the future', *Financial Times*, July 29, 2019.

[21] T. Ehrke-Rabel, "Big Data in Tax Collection and Enforcement" in W. Haslehner et al (eds.), *Tax and the Digital Economy* (Kluwer, 2019), 283-334.

[22] On tax preparation software see R. Mock and N. Shurtz, 'The Turbo Tax Defence' (2014) *Florida Tax Review* 15, 443.

[23] S. Morse, 'Government-to-Robot Enforcement' (2019) *University of Illinois Law Review*, 1497-1526.

[24] J.D. Blank and L. Osofsky, 'Automated Legal Guidance' (2021) *Cornell Law Review* 106.

[25] B. Alarie, A. Niblett and A. Yoon, 'Using Machine Learning to Predict Outcomes in Tax Law' (2017) *SSRN E-Journals*; and B. Alarie, A. Niblett and A. Yoon, 'How Artificial Intelligence will Affect the Practice of Law' (2017) *SSRN E-Journals*.

[26] R. de la Feria, "Tax Fraud and Selective Law Enforcement" (2020) *Journal of Law and Society* 47(2), 193-359.

[27] L. Lederman, "The IRS, Politics, and Income Inequality" (2016) *Tax Notes* 150(11); D. Gamage, "Creating Opportunity Through a Fairer Tax System: The Case for Taxing Extreme Wealth Holdings and "Real" (Book) Corporate Profits and for Improving IRS Funding" (2021) *Indiana Legal Studies Research Paper* 446.

[28] M. Keen and J. Slemrod, 'Optimal Tax Administration' (2017) *IMF Working Paper* WP/17/8.

[29] R. de la Feria, "Tax Fraud and Selective Law Enforcement" (2020) *Journal of Law and Society* 47(2), 193-359.

[30] C.B. Frey and M.A. Osborne, 'The Future of Employment: How Susceptible Are Jobs to Computerisation?' (2017) *Forecasting and Social Change* 114(C), 254-280.

[31] M.A. Grau Ruiz, "Fiscal Transformations due to AI and Robotization: Where Do Recent Changes in Tax Administrations, Procedures And Legal Systems Lead Us?" (2021) *Northwestern Journal of Technology and Intellectual Property* 19; R. Bird and E. Zolt, "Technology and Taxation in Developing Countries: From Hand to Mouse" (2008) *National Tax Journal* 61, 791-821.

[32] L Scarcella, "Tax Compliance and Privacy Rights in Profiling and Automated Decision Making" (2019) *Internet Policy Review* 8(4), 1-19.

[33] O. Okunogbe and V. Pouliquen, "Technology, Taxation, and Corruption: Evidence from the Introduction of Electronic Tax Filing" (2022) *American Economic Journal: Economic Policy* 14(1): 341–372.

[34] J.E. de Neve et al, How to Improve Tax Compliance? Evidence from Population-Wide Experiments in Belgium" (2021) Journal of Political Economy 129(5); M. Hallsworth et al, "The behavioralist as tax collector: Using natural field experiments to enhance tax compliance" (2017) *Journal of Public Economics* 148, 14–31; D. Halpern, *Inside the Nudge Unit – How Small Changes Can Make a Big Difference* (WH Allen, 2015), at 112-115.

[35] Although there is some evidence that people prefer moral discretion to AI, J. Jauernig, M. Uhl, and G. Walkowi, "People Prefer Moral Discretion to Algorithms: Algorithm Aversion Beyond Intransparency" (2022) *Philosophy and Technology* 35(2).

[36] C. Sunstein, "Governing by Algorithm? No Noise and Potentially Less Bias" (2021) *Harvard Public Law Working Paper* 21-35.

[37] O. Okunogbe and V. Pouliquen, "Technology, Taxation, and Corruption: Evidence from the Introduction of Electronic Tax Filing" (2022) *American Economic Journal: Economic Policy* 14(1): 341–372; S. Sequeira, and S. Djankov. "Corruption and Firm Behavior: Evidence from African Ports."(2014) *Journal of International Economics* 94 (2): 277–94.

[38] R. de la Feria and A. Grau Ruiz, 'Taxing Robots', In A. Grau (ed), *Interactive Robotics: Legal, Ethical, Social and Economic Aspects* (Springer Nature, 2022), Ch 17.

[39] S. Ranchordas, 'Experimental Regulations For AI: Sandboxes For Morals And Mores' (2021) *Morals and Machines* 1(1/2), and literature cited therein.

[40] D. Awrey, "Complexity, Innovation, and the Regulation of Modern Financial Markets" (2012) *Harvard Business Law Review* 2(2), 235-294; L Bennet Moses, "How to Think About Law, Regulation and Technology – Problems with 'Technology' as a Regulatory Target" (2013) *Law, Innovation and Technology* 5(1), 1-20.

[41] S. Ranchordas, 'Experimental Regulations For AI: Sandboxes For Morals And Mores' (2021) *Morals and Machines* 1(1/2); N. Smuha, "From a 'Race to AI' to a 'Race to AI Regulation': Regulatory Competition for Artificial Intelligence" (2021) *Law, Innovation and Technology* 13(1), 57-84.

[42] C. Sunstein, "Governing by Algorithm? No Noise and Potentially Less Bias" (2021) *Harvard Public Law Working Paper* 21-35; P. Hacker, "Teaching Fairness in Artificial Intelligence: Existing and Novel Strategies Against Algorithms" (2018) *Common Market Law Review* 55, 1143.

[43] S. Mayson, 'Bias In, Bias Out' (2019) *Yale Law Journal* 128, 2218; and A. Kelly-Lyth, 'Challenging Biased Hiring Algorithms' (2021) *Oxford Journal of Legal Studies* 1–30.

[44] J. Kleinberg et al, "Discrimination in the Age of Algorithms" (2018) *Journal of Legal Analysis* 10(113), 134-137.

[45] C. Criado-Perez, *Invisible Women: Data Bias in a World Designed for Men* (Abrams Pres, 2019); L. Rhue, "Racial Influence on Automated Perceptions of Emotions", 2018, mimeo.

[46] L. Scarella, 'Tax compliance and privacy rights in profiling and automated decision making' (2019) *Internet Policy Review* 8(4)

[47] S. van den Berg, 'Dutch government quits over 'colossal stain' of tax subsidy scandal', *Reuters*, January 15, 2021.

[48] S. Ranchordas and L. Scarcella, "Automated Government for Vulnerable Citizens: Intermediating Rights" (2021) *University of Groningen Faculty of Law Research Report* 11/2021.

[49] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016, OJ L 119, 4.5.2016, p. 1–88. T. Ehrke-Rabel, 'Bid Data in Tax Collection and Enforcement' in W. Haslehner et al (eds.), *Tax and the Digital Economy* (Kluwer, 2019), 283-334; L. Cordiell, "'A Robot is Watching You': Humanoid Robots and the Different Impacts on Human Privacy" (2021) *Masoryk University*

Journal of Law and Technology 15(2), 247-278.

[50] D.K. Citron, "Technological Due Process" (2008) *Washington University Law Review* 85, 1250-1314.

[51] S. Ranchordas and L. Scarcella, "Automated Government for Vulnerable Citizens: Intermediating Rights" (2021) University of Groningen Faculty of Law Research Report 11/2021; S. Ranchordas, "Empathy in the Digital Administrative State" (2022) *Duke Law Journal* 72.

[52] J. Bevacqua and V. Renolds, "The Digital Divide and Taxpayer Rights – Cautionary Findings from the United States" (2018) eJournal of Tax Research 16(3).

[53] The term is borrowed from G. Marx, "Rocky Bottoms and Some Information Age Techno-Fallacies" (2007) *Journal of International Political Sociology* 1(1), 83-110.

[54] J.D. Blank and L. Osofsky, 'Automated Legal Guidance' (2021) *Cornell Law Review* 106; and J.D. Blank and L. Osofsky, 'Simplexity: Plain Language and the Tax Law' (2017) *Emory Law Journal* 66, 189.

[55] R. de la Feria and A. Schoeman, 'Addressing VAT Fraud in Developing Countries: The Tax Policy-Administration Symbiosis' (2019) *Intertax* 47/11, 950-967.

[56] For further analysis of the political dynamics of tax reforms see R. de la Feria and M. Walpole, "The Impact of Public Perceptions on General Consumption Taxes" (2020) *British Tax Review* 67/5, 637-669.

[57] D. Gamage and D. Shanske, "Three Essays on Tax Salience: Market Salience and Political Salience" (2011) *Tax Law Review* 65, 23.

[58] R. Fernandes and D. Rodrik, "Resistance to Reform: Status quo bias in the presence of individual uncertainty" (1991) *American Economic Review* 81, 1146.

[59] M. Keen and J. Slemrod, *Rebellion, Rascals and Revenue – Tax Follies and Wisdom through the Ages* (Princeton University Press, 2021).

[60] S. Ranchordas, "One Foot in the Door: Evidence-Based Limits on the Legislative Mandate" (2018) Hukim —Journal on Legislation 207.

[61] Z. Kunda, "The Case for Motivated Reasoning" (1990) *Psychological Bulletin* 108(3), 480-498.

[62] O. Tykocinski and N. Steinberg, "Coping with Disappointing Outcomes: Retroactive Pessimism and Motivated Inhibition of Counterfactuals" (2005) *Journal of Experimental Social Psychology* 41(5), 551-558.

[63] R. de la Feria and A. Schoeman, 'Addressing VAT Fraud in Developing Countries: The Tax Policy-Administration Symbiosis' (2019) Intertax 47/11, 950-967.

[64] A situational crime prevention approach, see P. Alldridge, *Criminal Justice and Taxation* (OUP, 2017), at 34.