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Swimming upstream: leveraging data and analytics for taxpayer engagement – an Australian and international perspective

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Abstract

Tax administrations such as the Australian Taxation Office (ATO) are evolving from using data and analytics primarily as a means to data-match and choose audit cases, to using this as a vehicle that engages taxpayers and provides certainty and transparency. This article discusses the journey thus far for the ATO and other tax administrations in using data and analytics to promote willing participation in the tax system.** Approaches globally illustrate that, although tax administrations are still using data and analytics to determine individuals' and businesses' obligations post-lodgement, there is a progressive push for upstream compliance. Evolving with that push is the way we think about interacting with tax administrations, from increased early engagement to 'no touch' interactions which may not involve engagement at all.

Key words: tax compliance, data and analytics, taxpayer engagement

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** Note that, in Australia, the ATO administers both the taxation and superannuation systems. However, this article focuses on the tax system only.

1. INTRODUCTION

Tax administrations are no longer only working within the disciplines of accounting and law: they are harnessing big data for analytics – not only to enable targeted compliance activities, but also to help taxpayers comply with their obligations upstream, that is, as close as possible to the tax event.

After establishing definitions and scope in sections 2 and 3 respectively, this article in sections 4 to 8 discusses research such as recent Organisation for Economic Co-operation and Development (OECD) papers and commentary to illustrate the levels of compliance activities which harness data and analytics capabilities. This includes initiatives which try to embed taxpayer compliance, help prevent or pre-empt non-compliance, and activities which are aimed at addressing non-compliance upstream.

This article in sections 9 and 10 provides some insight into how these activities may engage taxpayers and affect their willing participation, as well as discussing further opportunities and unknowns which may lie ahead.

Challenges and opportunities for tax administrations are also discussed in section 11, including areas such as the movement away from self-assessment regimes, tax administration staff capability issues, privacy obligations and working with third party providers/intermediaries, as well as managing community perceptions and expectations. Section 12 concludes.

2. WHAT ARE DATA AND ANALYTICS?

Put simply, data and analytics, or advanced analytics as this is often referred to, are 'the science of examining raw data with the intention of drawing conclusions about and from that information'.[1] It is not a new or unfamiliar concept for tax administrators. For example, the US Internal Revenue Service (IRS) first used computers for selecting tax returns in 1962[2] and the Australian Taxation Office (ATO) has been developing computer-based data-matching capabilities since the 1970s.[3]

Tax administration staff have always made predictions and drawn conclusions about the likely impact of their actions. Now the prevalence and quality of information mean they 'simply seek to carry out these tasks and make judgements with more reliance on data'.[4] Existing techniques for analysing past events such as audit results or payment histories have now been enhanced to a point where this is 'about drawing on and qualifying real

[1] Andrew Goodman, 'Data Analytics for More Efficient Services and Better Lives' Civil Service Quarterly Blog (9 February 2017), available at: https://quarterly.blog.gov.uk/2017/02/09/data-analytics-for-more-efficient-services-and-better-lives (accessed 23 January 2018).

[2] Kimberly A Houser and Debra Sanders, 'The Use of Big Data Analytics by the IRS: Efficient Solutions or the End of Privacy as We Know It?' (2017) 19(4) *Vanderbilt Journal of Entertainment and Technology Law* 817, 829.

[3] Auditor-General, *The Australian Taxation Office's Use of Data Matching and Analytics in Tax Administration*, Auditor-General Audit Report No 30 2007-08 (Australian National Audit Office, 2008) 13, www.anao.gov.au/sites/g/files/net616/f/ANAO_Report_2007-2008_30.pdf.

[4] OECD, *Advanced Analytics for Better Tax Administration: Putting Data to Work* (OECD Publishing, 2016) 11.

human insight to identify more innovative and efficient approaches to how tax administrators work'.[5]

Data can be obtained from various sources, such as information provided by taxpayers to the tax authorities and by third parties such as banks and other government departments. However, for data to be meaningful, it does need to be analysed and applied in a way that provide insights and/or avenues for action.

The literature often refers to data as being analysed in two main ways:[6]

- Predictive analytics – this aims to anticipate likely problems by looking at patterns in historical data.
- Prescriptive analytics – this aims to assess whether particular actions were caused by, or just coincided with, a change in taxpayer behaviour (i.e., causal relationships).

3. SCOPE OF THIS ARTICLE

This article is not technical in terms of data-science terminology or the mechanisms of how data and analytics work. It examines the growing importance of data and analytics and their role in shifting emphasis away from downstream compliance to early intervention, and how this may impact on the willing participation of taxpayers to pay their fair share of tax.

James and Alley consider that 'tax compliance refers to the willingness of individuals to act in accordance within both the "spirit" and "letter" of the tax law and administration without the application of enforcement activity'.[7] The reasons why a person does not willingly participate in the tax system or comply with their tax obligations are many and varied. As McKerchar summarises, 'the pursuit of a single-overarching theory of compliance behaviour appears more than ever to be an idealistic exercise'.[8] Therefore, this article does not discuss these root causes in depth. However, when examining how the application of data and analytics is being used to engage taxpayers, the following theories for levels of taxpayer compliance are referred to:

- Financial and time costs to comply with the tax system;
- Complexity of tax laws and obligations, and
- Tax morale and perceived fairness of the tax system.

This article generalises taxpayers into three classes with the following broad characteristics:

- Individuals – those with personal income tax obligations from mostly employee wages;
- Small businesses – sole traders or businesses limited in size and revenue; and
- Large businesses – large domestic and foreign companies with a high turnover.

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[5] Goodman, above n 1.
[6] See OECD, *Advanced Analytics*, above n 4, 17.
[7] Simon James and Clinton Alley, 'Tax Compliance, Self-Assessment and Tax Administration' (2002) 2(2) *Journal of Finance and Management in Public Services* 27.
[8] Margaret McKerchar, 'Understanding and Predicting Taxpayers' Behavioural Responses to Actions by Tax Administrations' (2003) 3(10) *OECD Papers* 1, 2.

Lastly, the topic of this article is broad, so the following aspects are excluded from discussion:

- Use of data and analytics to improve efficiencies and costs of administering the tax system;
- Structure and best practice for data and analytics staff working in tax administrations;
- Information technology such as data storage, transmission, security and end-user apps as a means of taxpayer engagement;
- Arguments for and against legislative reform/tax simplification in any detail such as reduced filing systems, withholding at source, flattening of deductions;
- Tax fraud and evasion, and taxpayers operating 'outside the system'; and
- Measurement of effectiveness of data and analytics strategies.

4. OVERVIEW OF FINDINGS

Table 1 illustrates the data and analytic strategies being used by tax administrations based on the research conducted for this article. This forms the basis of the discussion that follows. It is by no means exhaustive and the locations of some of the category initiatives may be debatable in terms of placement. However, it provides a good roadmap to the discussion.

Table 1: Analytics in the Spectrum of Tax Compliance

Learnings from downstream compliance can contribute to better early intervention strategies

Entity type	Streamlined, invisible	← Taxpayer service Early intervention/ Upstream compliance →		Audit/Review Downstream compliance
	Embedded compliance	**Prevent non-compliance**	**Pre-empt non-compliance**	**Remedy non-compliance**
Individuals	No tax returns (UK 2020) Prefilled tax return - full	Prefilled tax return- partial	Unsupervised models (e.g. Nearest neighbour Aus.) Prediction of debt (using predictive and prescriptive analytics) Prediction of non-lodgement (using predictive and prescriptive analytics) Share client work related expenses risks with TAGs (Aus.)	Data matching post lodgement
Small business	Using natural systems – e.g. Taxed at point of sale (UK) No tax return (UK 2020)	Tools e.g. Small business benchmark tool (Aus.)	VAT real time risk application (Ireland)	Data matching e.g. ride sourcing, cash economy
Large business		Tax assured/co-operative compliance	Pre-lodgement review Income tax risk profile (Aus.) Tax gaps	Automated integrated risk assessments which form basis of risk plans (Canada) Risk model reviews
ALL		← Text mining phone calls, emails	etc →	
	← Single view of taxpayer/dashboard →			

*Those entries without tax administration references are initiatives from multiple jurisdictions

Source: author.

5. EMBEDDED COMPLIANCE

The embedded compliance category shown in Table 1 refers to making tax compliance 'just happen', as the use of data and analytics has the potential to make 'tax administration close to invisible'[9] for taxpayers, as discussed further below.

5.1 Individuals and small businesses

For individuals, this means engineering out taxpayers' tax return completion obligations. This is made possible by using data and analytics[10] to enable a summation of what tax amount is payable so the taxpayer either just pays or gets a refund without having to take any action on their own behalf.

One method of removing taxpayer completion responsibilities is to use an automated pre-filled tax return system. This can be defined as 'an organised method in collecting information from third parties and other sources and preparing a pre-populated income tax return by the revenue authority for the taxpayer using latest technological methods'.[11] A small number of tax administrations achieve complete pre-fill of all the taxpayer's data for selected groups.

Comprehensive pre-filling of the data for taxpayers 'is most widespread and successful in the Nordic tax administrations, where it has led to impressive compliance rates and low administrative cost for personal income tax, which in these jurisdictions represents a very significant share of the tax base'.[12] These administrations have limited non-standard deductions, which are an ideal environment in which to operate a full pre-filled tax return,[13] unlike some other tax administrations which have more varied and complex deduction regimes.

Efforts are also being made to eliminate tax return obligations. Movement in this direction is being made through the establishment of digital accounts where natural systems (such as accounting software) are used to feed data straight into a taxpayer's digital account, with no need to lodge an annual return.[14] HM Revenue and Customs (HMRC) in the United Kingdom is aiming to use this initiative to eliminate the need to lodge tax returns for individuals and small business taxpayers by the year 2020.[15] This is further discussed below in section 8.

Data collected by New Zealand's Inland Revenue Department (IRD) has eliminated tax returns for most people who earn salary or wages, interest or dividends. However, if other income is earned such as rental income, self-employment income or distributions

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[9] OECD, *Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies* (OECD Publishing, 2017) 190.
[10] In the case of no-fill or pre-filled returns, there is greater reliance on the data in terms of the data and analytics equation; however, it is considered that applying third party and other data to individual taxpayers necessitates an analytic competence.
[11] Idawati Ibrahim and Jeff Pope, 'The Viability of a Pre-Filled Income Tax Return System for Malaysia' (2011) 17(2) *Journal of Contemporary Issues in Business and Government* 85, 89.
[12] OECD, *Tax Administration 2017*, above n 9, 63.
[13] Ibrahim and Pope, above n 11, 85.
[14] HMRC, *Making Tax Easier: The End of the Tax Return* (2015) 5, www.gov.uk/government/uploads/system/uploads/attachment_data/file/413975/making-tax-easier.pdf.
[15] Ibid.

or the taxpayer has claims such as losses then a tax return is required to be lodged. Also, if a taxpayer is eligible for a refund then they must request a 'personal tax summary'.[16]

6. PREVENTING AND PRE-EMPTING NON-COMPLIANCE

The preventing and pre-empting non-compliance categories shown in Table 1 above describe where tax administrations are pushing data and analytics upstream. This is to prevent, rather than correct, issues and to engage with taxpayers early to meet their tax obligations. Upstream compliance refers to 'the desire for compliance with tax obligations to occur as close to the transaction or tax event as possible, or to allow compliance where it naturally occurs for the taxpayer'.[17]

The 2016 OECD report *Technologies for Better Tax Administration* encourages tax administrations to use data analytics to 'move compliance upstream'.[18]

Prevented and pre-empted non-compliance are discussed together below. However, in Table 1 'prevent' refers to how data and analytics are used to help a taxpayer 'get things right' further upstream. This can be contrasted with the situation where the tax administration has noticed a risk or outlier just before a taxable event and 'pre-empts' the taxpayer to re-examine their affairs before they go any further.

6.1 Individuals

6.1.1 Pre-filling

Partially pre-filled tax returns are used more commonly by tax administrations than fully pre-filled ones. A pre-filled tax return, where minimal input is required from the taxpayer, is available in countries such as Belgium, Denmark, Finland, Hungary, Iceland, Lithuania, Malaysia, Malta, Norway, Singapore and Slovenia.[19] In these jurisdictions, if the taxpayer does not make any changes after a certain amount of time, they are 'deemed' to have accepted it.[20] It is reported that Scandinavian countries experience 50 to 75 per cent rates of returns not requiring changes by the taxpayer.[21]

Other countries, like Australia, pre-fill some of the tax return but there is no 'deemed' acceptance. The taxpayer is required to lodge their tax return online, or through their tax agent, before the due date.[22]

Tax administrations routinely pre-fill income categories such as salary and wages, pensions, interest, dividends and capital gains, which are populated from third party

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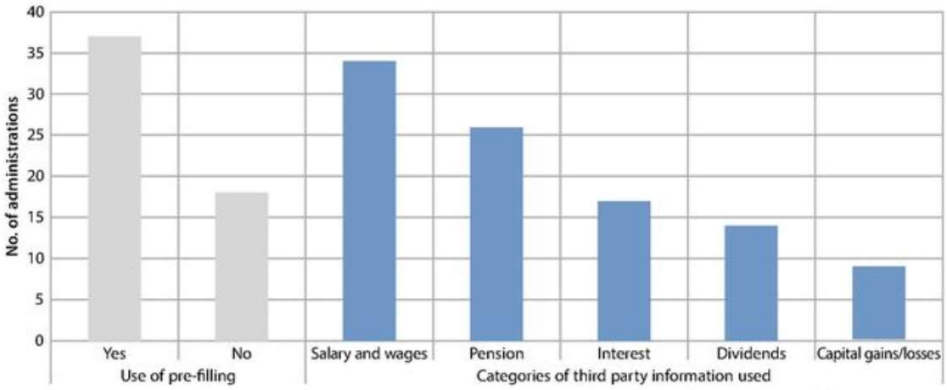
[16] See IRD, 'What To Do at the End of the Tax Year (31 March)', https://www.ird.govt.nz/income-tax-individual/end-year/ (accessed 26 January 2019).
[17] OECD, *The Changing Tax Compliance Environment and the Role of Audit* (OECD Publishing, 2017) 38.
[18] OECD, *Tax Administration 2017*, above n 9, 92.
[19] Ibid 83.
[20] Ibid.
[21] Forum on Tax Administration, *Using Third Party Information Reports to Assist Taxpayers Meet their Return Filing Obligations – Country Experiences With the Use of Pre-populated Personal Tax Returns*, Information Note (OECD, March 2006).
[22] For a full history of pre-filling returns, see Chris Evans and Binh Tran-Nam, 'Australia' in François Vaillancourt (ed), *Prefilled Personal Income Tax Returns: A Comparative Analysis of Australia, Belgium, California, Quebec, and Spain* (Fraser Institute, 2011) 1, www.fraserinstitute.org/sites/default/files/prefilled-personal-income-tax-returns.pdf.

sources. Figure 1 below shows that 37 tax administrations use pre-filling for tax returns, with salary and wages the most popular pre-filled field.

Figure 1: Categories of Third Party Information Used in Pre-Filled Returns, 2015



Source: OECD, *Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies* (OECD Publishing, 2017) 83.

Some tax administrations have further categories of information for pre-filling, for example from private health funds and government agencies.[23] Conversely, not all countries are able to pre-fill information due to factors such as lack of third party reporting mechanisms or inadequate technology.[24]

6.1.2 Tax return nudges

Along with pre-filling of tax returns, some jurisdictions including the UK and Australia are using prompts, popups or nudges to encourage compliance in real time. One instance of this can be seen when lodging a tax return. As claims are entered, computing analytics performs a real-time comparison with similar claims. This can then pop up a message saying, for example, 'Your work-related expenses are high compared to others in your occupation and income range'. This can prompt the taxpayer to review the claim or accept it as correct and move on. One such data and analytics tool is called *Nearest Neighbour* in Australia.

This real-time analysis has been used by the ATO since 2016:

> In *myTax* [the lodgement system for self-preparers] … taxpayers are prompted to check their claims before submitting their returns … The *Nearest Neighbour* analysis is transforming the way the ATO manages compliance,

[23] ATO, '2018 Pre-Fill Availability', https://www.ato.gov.au/individuals/lodging-your-tax-return/in-detail/pre-fill-availability/ (accessed 6 February 2018).
[24] Ibrahim and Pope, above n 11, 85.

> enabling greater emphasis on prevention and self-correction to encourage willing participation.[25]

The ATO has ostensibly extended this to tax agents by sharing risk model results of clients that have higher risk work-related expense claims, so that they can review them with their clients and make appropriate amendments.[26]

6.1.3 Debt and non-lodgement[27]

The use of data and analytics to determine how best to collect debt has been used by tax administrations for over a decade. It is reported that this 'work has mainly used *prescriptive* techniques to determine how to communicate most effectively with taxpayers in default' (italics original).[28]

To address debt levels, which in the year ended 2015 approximated EUR 1.8 trillion,[29] tax administrations have recognised that an outstanding debt means non-compliance. It is better to encourage upstream compliance by using 'predictive techniques to identify proactive and responsive actions to assist taxpayers to meet their obligations'[30] and therefore achieve better willing participation.

This can be done by looking at how debtors have reacted to different treatments in the past and then building analytical models that allow tax administrations 'to predict which actions will be most effective in dealing with different types of debtors in the present'.[31] Different types of debtors are identified by segmenting (eg, individuals vs small businesses, debt size and age, type of business) or risk clustering (incorporating taxpayer behaviour into risk modelling).[32]

For example, the Federal Public Service in Belgium has a model to predict the risk of bankruptcy over a 12-month period so that early recovery action can be taken.[33] Countries such as Finland, Ireland, Singapore and Sweden also have models aimed at assessing the likelihood of insolvency or other payment problems.[34]

Australia and Norway have 'built real time debt management systems that put in place different payment arrangements depending on taxpayers' predicated propensity and capacity to pay';[35] that is, an intervention that the analytics have predicted have the greatest chance of success. For example, the ATO sends SMS messages to individuals found to be a payment risk.[36]

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[25] OECD, *Tax Administration 2017*, above n 9, 56.
[26] See ATO, 'Tax Practitioner Stewardship Group Minutes 19 May 2017', https://www.ato.gov.au/General/Consultation/In-detail/Stewardship-groups-minutes/Tax-Practitioner-Stewardship-Group/TPSG-minutes-19-May-2017/?page=2 (accessed 26 January 2019).
[27] It is recognised that the use of data and analytics for debt intervention can extend to non-individuals; however, this is discussed in this 'Individuals' section because of the use of prescriptive analytics in this area which examines the behaviour of the individual, not legal entities.
[28] OECD, *Tax Administration 2017*, above n 9, 110.
[29] Ibid 105. Debt is as estimated by figures provided by Tax Administrators.
[30] Ibid 110.
[31] OECD, *Working Smarter in Tax Debt Management* (OECD Publishing, 2014) 22.
[32] Ibid 25-29.
[33] OECD, *Tax Administration 2017*, above n 9, 110.
[34] OECD, *Advanced Analytics*, above n 6, 26.
[35] Ibid.
[36] Ibid.

In the UK, the HMRC is blending prescriptive and predictive data analytics by building models to predict which taxpayers are most likely to miss filing deadlines and which interventions are likely to assist taxpayers to comply. The interventions have had input from behavioural insights[37] in order to tailor these strategies. An example is communicating with a small number of high-risk taxpayers by phone, instead of sending a blanket communication.[38]

These are all designed to make the right intervention at the right time, in order to improve the tax administration pillars of lodgement and payment, and ensure taxpayers comply with their obligations closer to the tax event/obligation.

6.2 Small and large businesses

Although it has been reported that some tax administrations are exploring how pre-filled returns could be used in the Small and Medium Enterprise (SME) and Value Added Tax (VAT) segments,[39] data and analytics are mostly being used by tax administrations to increase transparency with taxpayers and to address risks in real time.

6.2.1 Benchmark tools

Data and analytics are being used to identify trends, benchmarks and errors to inform taxpayers on how best to meet their tax obligations and identify the health of their business.

For example, the ATO publishes the small business benchmarks, which are 'key financial ratios designed to help small business compare their performance against similar businesses in the industry'.[40] They are 'based on the biggest data set available – calculated from tax returns and activity statements from over 1.4 million small businesses'.[41]

The ATO also publishes a guide for large business with goods and services tax (GST) obligations, which helps identify where a taxpayer may be at risk of non-compliance, identifies common errors (eg, the most common classification errors) and provides a guide to checking business systems.[42]

When tax administrations are transparent and share data, businesses can analyse their tax systems and operations to ensure instances of non-compliance are prevented. This is pushing compliance upstream so that tools are made available to help taxpayers solve any potential compliance problems much earlier, instead of the traditional methods of identifying outlier cases to audit.

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[37] Behavioural insights (from behavioural economic and social psychology) are being used with prescriptive data and analytics strategies to predict how an individual may react to a strategy; for example, they are also used in applying nudge theory.

[38] OECD, *Working Smarter in Tax Debt Management*, above n 31, 48.

[39] OECD, *The Changing Tax Compliance Environment*, above n 17, 51.

[40] ATO, 'The Cash and Hidden Economy', https://www.ato.gov.au/general/gen/the-cash-and-hidden-economy/#Smallbusinessbenchmarks (accessed 26 January 2019).

[41] ATO, 'Small Business Benchmarks', https://www.ato.gov.au/Business/Small-business-benchmarks/ (accessed 22 January 2018).

[42] ATO, 'GST and Business Systems: Large Business', https://www.ato.gov.au/business/large-business/in-detail/compliance-and-governance/gst-and-business-systems--large-business/ (accessed 16 February 2018).

6.2.2 Cooperative compliance

The ATO's focus for large corporate groups is on 'active prevention'. This recognises that it can 'foster willing participation better by preventing tax risks than by corrective approaches'.[43] One such active prevention tool is cooperative compliance. Cooperative compliance arrangements have been in place for many years – Australia in 2001,[44] other countries such as the US, UK and Netherlands by 2008.[45] Cooperative compliance:

> [c]an be described as a voluntarily enhanced relationship between a revenue body and business taxpayers based upon mutual increased transparency, cooperation and collaboration. It is intended to change the nature of the dialogue between revenue bodies and taxpayers where taxpayers pro-actively notify revenue bodies of any issues with a possible or significant tax risk and to disclose all facts and circumstances regarding such issues to speed up the audit process and resolve uncertain positions quicker. Additionally, taxpayers are expected to give a revenue body an entry to their control systems used to manage tax risks on the premise that if the revenue body is satisfied with those, there should be no need for them to carry out a traditional audit of underlying transactions.[46]

It is reported that tax administrations are starting to extend cooperative compliance approaches successfully used in large business areas into other taxpayer areas.[47] This is because of improvements in compliance risk management 'made possible by access to a wider range of data, advanced analytics and risk assessment techniques'.[48] It will be interesting to see how this is implemented, as individuals and small businesses are less likely to have dedicated tax managers to assist in implementing cooperative compliance arrangements, adding time and cost even if in the short term. It would also seem more relevant to businesses, as individuals' tax obligations should mostly be covered by pre-filled returns in the countries where these are available.

A more recent extension of cooperative compliance is tax assured or 'justified trust'. Tax assured measures the proportion of the revenue base where the tax administration has 'justified trust' that the taxpayer is complying with all obligations and that the information in the tax return is reliable.[49] In Australia, to achieve justified trust the ATO seeks objective evidence that would lead a reasonable person to conclude that a taxpayer paid the right amount of tax, tailoring its assurance approach based on the unique business profile of a taxpayer and reviewing four key areas:[50]

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[43] ATO, 'We Assist and Assure the Tax Compliance of Large Corporate Groups', https://www.ato.gov.au/general/tax-and-corporate-australia/in-detail/we-assist-and-assure-the-tax-compliance-of-large-corporate-groups/ (accessed 18 January 2018).
[44] See ATO, *Cooperative Compliance: Working with Large Business in the New Tax System* (2000), available at: http://www.ctsi.org.au/publications/ATOpubs/cooperative%20compliance.pdf?.
[45] Ernst & Young, *Co-operative Compliance* (Ernst & Young, 2014), available at: https://www.wu.ac.at/fileadmin/wu/d/i/taxlaw/institute/WU_Global_Tax_Policy_Center/Co-operative_compliance_final_final_brochure_HR.pdf (accessed 16 February 2018).
[46] Ibid.
[47] OECD, *The Changing Tax Compliance Environment*, above n 17, 47.
[48] Ibid.
[49] OECD, *Measures of Tax Compliance Outcomes, A Practical Guide* (OECD Publishing, 2014) 51.
[50] ATO, 'Justified Trust', https://www.ato.gov.au/Business/Large-business/Justified-Trust/ (accessed 17 January 2018).

- Understanding a taxpayer's tax governance framework;
- Identifying tax risks or concerns it has communicated to the market and determining whether these may be present;
- Understanding current business activities, particularly significant or new transactions, and the tax outcomes; and
- Understanding why the accounting and tax results vary, which 'requires a holistic understanding of the taxpayer's business operations and financial performance'.[51]

Although this initiative is not necessarily reliant on data analytics, it is based on being transparent about data, risk and other information, and using this to prevent non-compliance. This helps negate the need for tax administrations to use data and analytics for downstream audit compliance.

6.2.3 Real-time risk reviews

Revealing risk assessments in real time and using predictive models are enabling tax administrations to pre-empt non-compliance early.

In Australia, risk assessments are shared in ATO pre-lodgement compliance reviews, enabling the taxpayer to know about issues and potential risks before they arise.[52] For privately-owned and wealthy groups, an income tax risk profile is shared with the taxpayer comprising:[53]

- A view of the taxpayer's risk categorisation based on the ATO's risk management framework (the risk management framework is used to differentiate risk according to the risk profile and the ATO's understanding of the taxpayer's risk position, circumstances, choices and behaviours);
- An analysis of the taxpayer's tax performance and economic performance compared to similar businesses;
- An overview of the taxpayer's group structure; and
- Specific areas that attract the ATO's attention.

This gives the taxpayer an opportunity to self-correct and provide more accurate information to the ATO.[54]

In Ireland, a real-time risk approach identifies suspicious VAT returns by making better use of available data, thereby improving prevention and detection of non-compliance. If risk scores are low, the refund is released; if medium or high, a staff member intervenes to investigate.[55] This ensures the low-risk cases are not examined and pushes high-risk cases downstream. As data and analytics tools mature, it is easy to see that these types of interventions are likely to become more tailored to specific circumstances.

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[51] Ibid.
[52] ATO, 'We Assist and Assure the Tax Compliance of Large Corporate Groups', above n 43.
[53] ATO, 'Income Tax Profile', https://www.ato.gov.au/Business/Privately-owned-and-wealthy-groups/What-you-should-know/Transparency/Income-tax-profile/ (accessed 26 January 2019).
[54] Ibid.
[55] OECD, *Tax Administration 2017*, above n 9, 98.

7. TEXT-MINING INBOUND CONTACT

Text-mining data and analysing the content of inbound contact from taxpayers can assist tax administrations in getting the right services to taxpayers.

The IRS gathers information on inbound calls using a speech analytics software tool to analyse recorded taxpayer calls and identify areas for improvement, for example by identifying common topics, enabling it to better target guidance for taxpayers on its website.[56]

Singapore uses text-mining to analyse the content of emails to identify the nature of taxpayer enquiries, structuring the data to derive patterns and insights. For example, for one project text-mining helped identify common queries after a tax policy was changed, enabling a timely and targeted campaign, updated guidance and reduced need for taxpayers to contact the Inland Revenue Authority of Singapore (IRAS).[57]

Even Google Analytics data can help tax administrations get taxpayers to the right area for assistance. New Zealand Inland Revenue found that people who wanted access to tax services online were landing on a page that provided Inland Revenue contact details, so they changed the page to give people easier, more direct access to tax services.[58]

The Canadian Revenue Agency states that the use of text-mining can discover trends to enable it to make it easier for taxpayers to use information or forms; for example, whether a certain document is causing confusion and needs to be clearer, or whether taxpayers are getting the access to benefits they are entitled to.[59]

In the 2012 Forum on Tax Administration information note, *Working Smarter in Revenue Administration – Using Demand Management Strategies to Meet Service Delivery Goals*, tax administrations are encouraged to invest in methodologies, including analytics, to assist them in determining the root causes of demand in service delivery.[60] Although tax administrations are using data to identify the drivers of demands, for example coding by call centre agents, speech analytics and caller surveys,[61] this is often done only to discover the type of enquiry, not the underlying reason for the contact.[62] This is because finding root causes can be time consuming and resource intensive. The use of analytics to determine root causes seems to be reserved for when there has been an unanticipated spike in demand which warrants further analysis and recommendations for change.[63]

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[56] Ibid 91.
[57] Ibid 143.
[58] Lana Gibson, 'Govt.nz: Improving IRD Content Using Analytics' *Digital.govt.nz* (23 April 2015), https://www.digital.govt.nz/blog/govt-nz-improving-ird-content-using-analytics/ (accessed 26 January 2019).
[59] Erica Alini, 'What the CRA Can and Can't Do With Your Data and Social Media Accounts' *Globalnews.ca* (11 March 2017), https://globalnews.ca/news/3292307/what-the-CRA-can-and-cant-do-with-your-data-and-social-media-accounts/ (accessed 25 January 2018).
[60] Forum on Tax Administration, *Working Smarter in Revenue Administration – Using Demand Management Strategies to Meet Service Delivery Goals*, Information Note (OECD, January 2012) 2.
[61] Ibid 18.
[62] Ibid 22.
[63] Ibid 25.

The private sector is seen to be more advanced than public tax administrators in identifying the causes of contact, as they have implemented more of the required technology.[64] With many tax administrations continuing to experience high demand from inbound contact from taxpayers,[65] there are further opportunities to invest in this area. This would assist in diverting the inbound contact with staff to other means of assisted compliance, such as tools, information and self-service channels,[66] which may be simpler and less costly for the taxpayer.

8. SINGLE VIEW OF TAXPAYER

Perhaps the ultimate master data compliance tool is the 'single view of taxpayer'. This consolidates internal and external data sources to bring a '360-degree' view that supports 'administrations in examining both the type and timing of interventions that help taxpayers meet their tax obligations, including paying tax debts'.[67] These views may be internal – available only to the tax administration – or external and shared with taxpayers, or a combination of both.

HMRC is enabling this consolidation by providing every individual and business with a personal digital tax account. These accounts enable:

- HMRC to use the information it has to tailor the services it provides, according to each taxpayer's individual circumstances;
- Taxpayers to see all the information HMRC holds (including third party data) and can check that these details are correct;
- Taxpayers to see how much tax they are liable for, as HMRC collects information affecting tax as close to real time as possible, helping to prevent errors and debts;
- Taxpayers to see a single picture of their liabilities and entitlements in the one place, just like online banking, by the year 2020;
- Record-keeping software to be linked directly to HMRC;
- Access to a range of other government services;
- Taxpayers to allow tax agents to manage their account; and
- Enough information so that, in time, taxpayers will not need to complete tax returns.[68]

Predictive analytics can be used to examine the information collected in digital accounts. This can assist the HMRC to tailor to taxpayer needs at the right time, such as pushing information and support when someone approaches retirement or when a business registers for VAT for the first time or takes on a new employee.[69]

In Australia, the ATO Corporate Plan recognises that this is a strategic piece of work towards achievement of its desired future state, described as the 'enterprise view of client risk'. The plan is to 'continue to update our systems to integrate client data and

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[64] Ibid 41.
[65] Ibid 2.
[66] See OECD, *Increasing Taxpayers' Use of Self-Service Channels* (OECD Publishing, 2014) 30.
[67] OECD, *Tax Administration 2017*, above n 9, 30.
[68] HMRC, 'Overview of Making Tax Digital' (Policy Paper Updated 13 July 2017), www.gov.uk/government/publications/making-tax-digital/overview-of-making-tax-digital (accessed on 23 January 2018).
[69] HMRC, 'Making tax easier: The end of the tax return', above n 14, 6.

information at the enterprise level, to tailor our actions with greater consistency and efficiency'.[70] Whether this view is internal and/or external facing only is not specified at this time.

Other countries have system views which are primarily built for audit purposes. For example, Singapore has a system called *i-case* which is a consolidated dashboard view of a taxpayer's financial and tax affairs of a company, including a compliance scoring methodology.[71] There are opportunities to use these types of systems as a base for information, and develop them, as the HMRC is currently doing.

9. EMBEDDED AND UPSTREAM COMPLIANCE – EFFECTS ON WILLING PARTICIPATION

9.1 Pre-filling

Generally, pre-filling information on a tax return does increase opportunities for taxpayers to comply. However, there are limitations on relying on pre-filling to promote willing participation.

9.1.1 Availability of information

The OECD reports that one-third of individual returns are still filed in paper form.[72] Those taxpayers either do not have the opportunity to use pre-filled information[73] or have chosen not to use it.

Not all information is available in pre-fill. Even if it was, most taxpayers are expected to check its accuracy before it is 'deemed' accepted by tax administrations in those countries with extensive pre-filling. Therefore, tax administrations still need strategies such as awareness and education to help ensure that taxpayers value the tax system and willingly participate in providing full and complete tax returns. It has also been questioned whether having full pre-filling or dispensing with tax returns altogether may actually lower taxpayer engagement. This is on the basis that there is no active participation, at least annually, by the taxpayer. This could lessen the taxpayer's awareness of their tax contribution.[74]

In Australia, the ATO warns that some pre-fill information is not available until mid-August and it encourages taxpayers to check the information provided.[75] It may be that a third party has not supplied data yet, information cannot be matched to the taxpayer's record or the information has not passed all quality checks.[76]

In Singapore, employment income pre-filling is only automatic if employers are in the 'auto inclusion scheme'.[77] For example, Company A will send details to the IRAS and

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[70] ATO, *ATO Corporate Plan 2017-18* (2017) 9, https://www.ato.gov.au/uploadedFiles/Content/CR/downloads/n7769_08_2017_js39469.pdf.
[71] OECD, *The Changing Tax Compliance Environment*, above n 17, 77.
[72] OECD, *Tax Administration 2017*, above n 9, 191.
[73] It is noted that governments are trending towards digital by default, which will affect the availability of paper returns.
[74] Jason Kerr, 'Tax Return Simplification: Risk Key Engagement, A Return To Risk?' (2012) 10(2) *eJournal of Tax Research* 465.
[75] ATO, '2018 Pre-fill availability, above n 23.
[76] Ibid.
[77] IRAS, 'No-Filing Service (NFS) – Frequently Asked Questions' (IRIN 117-FAQ 1/2017),

Company B will not as it is not in the scheme, putting the onus on its employees to add details of Company B income in their tax returns within 30 days.[78]

In some countries, the information available is often limited to income derived by the taxpayer. There are opportunities to drive taxpayer engagement by including deductions or entitlements which are of benefit to the taxpayer. For example, in Denmark the Danish Customs and Tax Administration (SKAT) has third party reporting for tax-deductible charity donations, which are sent by charities to SKAT and then pre-filled on the taxpayer's return.[79] When it was introduced in 2008, SKAT found there had been substantial under-claiming of deductions and received twice as many claims than when donations had been self-reported.[80]

Another example is in Australia, where taxpayers (usually retired) who are not required to lodge a tax return previously had to apply online to the ATO for a refund of franking credits. A pilot from 1 July 2017 removed the need for some such taxpayers to apply for a refund, as the ATO automatically issued refunds of franking credits based on information reported to it by share registries.[81]

9.1.2 Cost to comply

Many individuals still use tax agents to lodge their return (in Australia, 67 per cent of individuals lodged through a tax agent, 30 per cent lodged their own return online and 3 per cent lodged their own paper return in 2016-17).[82] For the 30 per cent who lodged their own return online, the ATO states that this took 30 minutes on average to complete.[83] The statistics are different for countries such as Sweden and Denmark, where no more than 10 per cent of individuals use an intermediary.[84] This is probably indicative of many factors, including less complex tax systems.

In Australia, Tran-Nam, Evans and Lignier conducted a study and found that electronic returns (including pre-filled tax returns) have done little to slow the increase compliance costs for individuals, measured from either the social or taxpayers' perspectives.[85] Interestingly, this study found that compliance costs increased by around 73 per cent from 1995 to 2012, which is noteworthy in terms of the relationship between the costs of compliance and willing participation. It was found that, even with technologically driven initiatives such as e-tax and pre-filling, there was still an increased reliance on

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available at: www.iras.gov.sg/irashome/uploadedFiles/IRASHome/Individuals/FAQ_NFS.pdf (accessed 26 January 2019).

[78] Ibid.

[79] OECD, *Measures of Tax Compliance Outcomes*, above n 49, 56.

[80] Ibid.

[81] ATO, 'Refunding Franking Credits – Individuals, Apply For A Refund', https://www.ato.gov.au/individuals/investing/in-detail/investing-in-shares/refunding-franking-credits---individuals/?page=3#Apply_for a refund (accessed 7 January 2018).

[82] Commissioner of Taxation, *Annual Report 2016-17* (Australian Taxation Office, 2017) 15, available at: https://www.ato.gov.au/about-ato/annual-report-2016-17/.

[83] Frank Chung, 'ATO Says "No Excuses" On Last Day To Lodge Your Tax Return' *News.com.au* (31 October 2017), available at: http://www.news.com.au/finance/money/tax/ato-says-no-excuses-on-last-day-to-lodge-your-tax-return/news-story/a8bda2eff4e5fb452da4cc9798607bbd (accessed 7 January 2018).

[84] OECD, *Increasing Taxpayers' Use of Self-Service Channels*, above n 66, 35.

[85] Binh Tran-Nam, Chris Evans and Phil Lignier, 'Personal Taxpayer Compliance Costs: Recent Evidence From Australia' (2014) 29(1) *Australian Tax Forum* 137.

tax agents,[86] especially for those taxpayers with high incomes.[87] There was also evidence that low-income earners had high costs of compliance.[88]

It would be interesting to revisit the study, as pre-filling is more extensive and has increased functionality today, noting that:

- In August 2001 (one-third of the way into the period of the study) 110,000 taxpayers had lodged with e-tax,[89] while in August 2017 (five years after the study) 1.6 million taxpayers lodged with *myTax*;[90]
- In 2012-13, 74 per cent of individuals used a tax agent[91] compared to the latest figure of 67 per cent in 2016-17.

A further question is whether drivers such as the desire to maximise refunds and confusion over complex tax laws, among others, mean that similar conclusions could be drawn in relation to cost of compliance and the use of tax agents for high-income earners.

9.1.3 Lodgement and reporting

Using data and analytics to pre-fill tax returns can encourage taxpayers to lodge earlier and on time. For example, Singapore boasted a 96 per cent strike rate on returns being lodged on time in 2016.

In terms of correct reporting, a UK study looking at the effects of pre-populating tax forms with third party data and using nudges to increase compliance found that:[92]

- Partially pre-populating forms with correct data improves compliance;
- Use of inaccurate information decreases compliance; and
- Behavioural prompts work best when responsive to inputs of values by the taxpayer.

It is not surprising that pre-filled returns which contain accurate third party data improve the reporting of a tax position. A situation which can impact on compliance however is where the third party data is incorrect. Taxpayers may leave the information as it is, either to their benefit or the tax administrator's benefit. It is fair to say that there is an expectation that the tax administration will provide reliable data, and this expectation will affect the actions of taxpayers and compliance levels.

The UK study also found that, when the pre-filled income fields were done in a way that disadvantaged taxpayers, a small shift in non-compliance to non-pre-populated

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[86] Ibid 163.
[87] Ibid 171.
[88] Ibid 157.
[89] ATO, '110,000 Australians Lodge Tax Returns With E-Tax' *media release Nat 01/68* (14 August 2001).
[90] ATO, 'Tax Time 2017 Off To A Flying Start' *media release* (9 August 2017), https://www.ato.gov.au/media-centre/media-releases/tax-time-2017-off-to-a-flying-start/.
[91] Commissioner of Taxation, *Annual Report 2012-13* (2013) 33, https://www.ato.gov.au/uploadedFiles/Content/CR/Annual_Reports/Annual_Report_2012-13/Downloads/complete.pdf.
[92] Miguel Fonseca and Shaun Grimshaw, 'Do Behavioral Prompts in Prepopulated Tax Forms Affect Compliance? Experimental Evidence with Real Taxpayers' (2017) 36(2) *Journal of Public Policy and Marketing* 213.

fields was observed.[93] Moreover, gaps in pre-fill data gave rise to non-compliance, either because the taxpayer did not believe the tax administration had access to the data or because they assumed the amount pre-filled was accurate.[94] This highlights the fact that partial pre-filled returns are predicated on the basis that most individuals want to comply, while those who do not want to comply have opportunities to manipulate labels that are not pre-filled and omit income that has not been picked up by third parties. However, there will always be those who try to 'get around the system' and tax administrations need to be aware of this and mitigate these risks.

Some of the common gaps in partial pre-filled data are rebates, work-related expenses and other reliefs;[95] therefore, these need to be self-reported by taxpayers. Warren has found that there needs to be a closer examination of work deductions being claimed in Australia.[96] He found that over a 10-year period (2004-14) there was a significant increase in work-related expenses claims for taxpayers who lodged electronically, even though the average level of claim declined.[97]

Although there is only a suggested correlation with pre-filling, considering the increasing use of pre-filled returns lodged online, it would be worthwhile to further investigate this finding for patterns over 2014-2018, to determine whether partial pre-filled returns change the behaviour of taxpayers claiming deductions.

There is also evidence to suggest that taxpayers are more likely to report income that is verifiable by third party sources irrespective of whether it is pre-filled. For instance, the IRS found a 93 per cent compliance rate in reporting income subject to substantial income reporting but only a 37 per cent compliance rate in reporting income subject to little or no withholding.[98] This suggests that pre-filling of verifiable data may do little to increase compliance in some jurisdictions.

Tax administrations also need to be aware of the growing expectation that pre-filling of data will be available to taxpayers, especially when they know the government holds information about them. For example, it was reported in the UK that pensioners complained that the HMRC was not addressing their expectations, as some had to fill out a tax return even though the government had all their pension information.[99] If these expectations are not met, this may affect tax morale.

9.2 Nudges

As mentioned above in section 8.1.4, the recent UK study also looked at nudges, that is, behavioural prompts when completing a tax return. These were found to work best when responsive to direct inputs of values by the taxpayer,[100] as illustrated by the *Nearest Neighbour* tool in Australia. This is a positive result in terms of improving engagement,

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[93] Ibid 220-221.
[94] OECD, *Tax Administration 2017*, above n 9, 194.
[95] Ibrahim and Pope, above n 11, 85.
[96] Warren, 'e-filing and compliance risk: evidence from Australian personal income deductions' (2016) 31 *Australian Tax Forum* 577.
[97] Ibid.
[98] OECD, *Tax Administration 2017*, above n 9, 83.
[99] Sam Meadows, 'Tax Return Burden Continues for 1.7m Pensioners' *The Telegraph* (29 July 2017), https://www.telegraph.co.uk/tax/return/tax-return-burden-continues-17m-pensioners (accessed 7 January 2018).
[100] Fonseca and Grimshaw, above n 92.

but it is still relatively early in its implementation. As such, it would be worthwhile to investigate the impact on compliance in subsequent tax years, once taxpayers are accustomed to pop-up messages.

Another aspect of nudging which may affect taxpayer engagement is that the analytics used are not discriminatory by nature. They are based on predictions and numbers. Because predictive analytics does not ask why, it does not, for example, reveal why people may have higher than normal expenses on their tax returns.[101] Those who are genuinely doing the right thing may have negative responses to nudges which seem 'unfair'.

The current use of nudges also appears to 'protect the revenue' in prompting taxpayers to check their claims that do not sit in the normal range. There are opportunities to better engage with taxpayers and increase willing participation by using data and analytics to notify taxpayers that they may be under-claiming in certain fields, not just in relation to over-claiming.

9.3 Debt

The OECD reports that data analytics has enabled more effective interventions to target debtors and 'some countries have been able to achieve dramatic positive results at a low cost'.[102] For example:

- The ATO's use of behavioural insights to differentiate its engagement with taxpayers has contributed to an increase in the amount of debt collected;[103]
- In Ireland, the segmentation of taxpayers into five tiers based on the risk to revenue (1 being low risk, 5 being highest potential liability) has led to a debt reduction of 43 per cent;[104]
- In Canada, where taxpayers are contacted after being selected by a data-mining tool (which assigns a score of 0 to 100 predicting the likelihood of the taxpayer making a payment), those predicted to be non-compliant have made payments to the value of CAD 80-112 million.[105]

With these positive results, this is likely to be an expanding area in the use of data and analytics to improve payment compliance.

10. REMEDYING NON-COMPLIANCE

As was shown in Table 1 in section 4, while there is an expanding use of data and analytics in compliance activities upstream, there is still a myriad of downstream compliance activities which occur post-lodgement of taxpayers' tax obligations. This is not surprising as, on average, it is reported that tax administrations still have 32 per cent

[101] Houser and Sanders, above n 2, 817.
[102] OECD, *Working Smarter in Tax Debt Management*, above n 31, 99.
[103] Ibid 22.
[104] OECD, *Tax Administration 2017*, above n 9, 157-158.
[105] Ibid 159.

of their staff resources engaged in tax audit/verification work.[106] However, there is improvement in compliance work being targeted to the right areas.

10.1 Individuals and small businesses

Data-matching is not a new concept.[107] Yet, with the increasing availability of third party data, tax administrators can more comprehensively match the details they hold with details taxpayers provide on their tax returns and act to address the discrepancies.[108]

The traditional one-to-one audits are being replaced by more risk-based processes 'with increasing use of advanced analytics and rules-based systems to identify potential anomalies and higher risk activities or transactions'.[109] For example, in India a new data analytics platform called Project Insight is being rolled out; using traditional tax data such as tax returns and social media information, '[t]he algorithm will match residents' spending patterns, as evidenced from their social media postings, with their declared income'.[110]

Targeted data and analytic strategies post-lodgement are also being used to improve future engagement. In Australia, ride-sourcing data matching is currently a focus in ensuring taxpayers are meeting their tax and registration obligations. Although this is a downstream compliance activity, such insights can push strategies upstream to improve willing participation. The ATO reports that, 'to date, the data has been used exclusively in a number of educational campaigns to alert drivers to their tax obligations'.[111] The data-matching also improves engagement with taxpayers who are complying, as it reduces the likelihood of 'unnecessarily contacting taxpayers who appear to be complying with their tax obligations'.[112]

10.2 Large businesses

Tax administrations are also targeting riskier larger taxpayers using data and analytics. For example, the Canada Revenue Agency (CRA) has an automated Integrated Risk Assessment System to determine the overall risk profile for each taxpayer.[113] The highest risk cases form the audit work program, enabling the CRA to focus on those taxpayers and reduce the compliance burden for businesses that are low risk[114] and therefore do not need to be examined.

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[106] OECD, *Tax Administration 2017*, above n 9, 36.
[107] The use of data-matching by the ATO in 2008 is discussed in Auditor-General, *The Australian Taxation Office's Use of Data Matching*, above n 3.
[108] See for example, ATO, 'Data-Matching Letters', https://www.ato.gov.au/Individuals/Data-matching-letters/ (accessed 8 January 2018).
[109] OECD, *The Changing Tax Compliance Environment*, above n 17, 60.
[110] Priyanka Bhunia, 'Indian Government to Detect Tax Evasion Using Analytics On Traditional Data and Social Media Information' *Opengovasia.com* (27 October 2017), https://www.opengovasia.com/indian-government-to-detect-tax-evasion-using-analytics-on-traditional-data-and-social-media-information/ (accessed 26 January 2019).
[111] ATO, 'Ride-Sourcing: 2015-16 to 2018-19 Data Matching Program Protocol', https://www.ato.gov.au/General/Gen/Ride-sourcing-2016-19-data-matching-protocol/ (accessed 18 January 2018).
[112] Ibid.
[113] OECD, *Tax Administration 2017*, above n 9, 170.
[114] Ibid.

The US has a program which allows auditors to identify areas of international compliance risk on the tax returns of companies.[115]

Moreover, the ability to target multinational company risks is likely to increase, with tax administrations requiring electronic filing such as country-by-country (CbC) local file reporting. The OECD's CbC reporting mandates increased data collection and disclosure from companies. With more countries joining this initiative, data and analytics will continue to grow.[116] This will assist tax administrations in identifying cross-jurisdiction risks.

Tax administrations are also working on closing the 'tax gap', that is, the difference between total amounts of taxes owed to the government versus the amount that tax administrations receive. For example, the ATO uses its operational data to estimate the total value of non-compliance across the market.[117] It asserts that, by addressing the large corporate group income tax gap, other taxpayers are more willing to comply[118] because they see those entities paying their fair share of tax.

11. FURTHER CHALLENGES AND OPPORTUNITIES

11.1 Privacy

Sharing of data is governed by instruments such as:

- Laws which mandate that third parties (such as banks, employers and health insurers)[119] report information to the tax administrations; and
- Information agreements and laws between countries, such as the Foreign Account Tax Compliance Act (FATCA),[120] which are aimed at helping to prevent tax evasion.[121]

Tax administrations are also required to comply with laws to protect taxpayers' privacy, including the collection of data.[122]

There are concerns that some tax administrations are not abiding by these laws and/or not using data as it is intended. Both can lead to diminished willing participation in the tax system, including the willingness to share data.

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[115] OECD, *The Changing Tax Compliance Environment*, above n 17, 76.
[116] Ernst & Young, *Running the Numbers: How Data Analytics Is Transforming Tax Administration* (Ernst & Young, 2016) 1, http://www.ey.com/Publication/vwLUAssets/EY_-_Running_the_numbers/$FILE/ey-running-the-numbers.pdf.
[117] ATO, 'Large Corporate Groups Income Tax Gap', https://www.ato.gov.au/about-ato/research-and-statistics/in-detail/tax-gap/large-corporate-groups-income-tax-gap/ (accessed 12 January 2018).
[118] Ibid.
[119] See ATO, 'Sources of third-party information', https://www.ato.gov.au/About-ATO/Commitments-and-reporting/In-detail/Privacy-and-information-gathering/How-we-use-data-matching/?page=2#Sources_of_third_party_information (accessed 6 February 2019).
[120] FATCA imposes certain due diligence and reporting obligations on financial institutions to report US citizen or US tax-resident Account Holders to the IRS.
[121] See HMRC, 'Automatic Exchange of Information: Introduction', Guidance (29 April 2016), www.gov.uk/guidance/automatic-exchange-of-information-introduction.
[122] In Australia, this includes the *Privacy Act 1988* and the *Income Tax Assessment Act 1936.*

One Canadian media article has claimed that 'when Canadians provide information to the government, they provide it for a specific purpose, not for algorithms and predictive analytics'.[123] In Australia, the recent privacy survey found that, in terms of misuse of information, nine out of ten people thought that personal information being used for a purpose other than the one it was provided for constitutes misuse.[124]

On the other hand, taxpayers seem more gratified where their data is used in a positive way. A recent survey in the UK for the Government Data Science Partnership showed that public approval for governments to share data is actually quite high when it is used in measured, proportionate and targeted ways.[125] Also, the recent privacy survey in Australia found that nearly half the community felt comfortable with government agencies using their personal details for research or policy-making purposes.

Houser and Sanders[126] argue that in the US the IRS is engaging in public and commercial data pools which violate fair information practices and federal law. They state that 'most of the rules permitting the IRS to obtain records from third parties were written prior to the existence of social media, and certainly prior to the current state of technology'.[127] They compare the use of data and analytics between the IRS and a commercial entity like Nike, stating that using data-mining to create more detailed profiles of taxpayers could lead to penalties; if Nike creates profiles and uses that information, the ramification is only targeted marketing.[128] There is also a concern that, when the IRS uses data, 'taxpayers don't have a way to check the information collected nor correct any mistakes in the information'.[129]

The challenge for governments is to ensure privacy laws are contemporary and the challenge for tax administrators is to assure taxpayers that data is being used appropriately, effectively and securely, and that they are transparent about it.

11.2 Reliability of data

The quality of conclusions drawn from analysing data is largely dependent on the correctness and reliability of that data. For example, in Australia, nudge messaging on high-risk work-related expenses is dependent on the correct occupation codes being selected. In India, matching social media postings with declared income may not lend itself to an accurate outcome, as taxpayers often do not post reliable information on Facebook and other social online platforms.[130]

The use of data and analytics may still need a human element no matter how sophisticated unsupervised models become. In Australia, Centrelink (the government

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[123] Elizabeth Thompson, 'Canada Revenue Agency Monitoring Facebook, Twitter Posts of Some Canadians' *CBC News* (19 January 2017), available at: http://www.cbc.ca/news/politics/taxes-cra-facebook-big-data-1.3941416 (accessed 25 January 2018).
[124] Jane Van Souwe et al, *Australian Community Attitudes to Privacy Survey 2017* (Office of the Australian Information Commissioner, 2017) i-ii.
[125] John Manzoni, 'Big Data in Government: The Challenges and Opportunities' (Speech delivered at Reform, 21 February 2017), https://www.gov.uk/government/speeches/big-data-in-government-the-challenges-and-opportunities (accessed 20 January 2018).
[126] Houser and Sanders, above n 2, 817.
[127] Ibid 821.
[128] Ibid 825.
[129] Ibid 836.
[130] Ibid 841.

provider of welfare support and services) was subject to some controversy when debt data was used to automate 'nearly 170,000 notices of potential overpayments … with many Australians incorrectly told they have outstanding debts'.[131] The data was obtained from the ATO but, according to Victoria Legal Aid, errors occurred where employers' names were being recorded differently in separate systems so it appeared that a person had two jobs rather than one, and errors occurred when comparing annual information from the ATO and fortnightly income reported to Centrelink.[132]

These examples highlight the importance of using correct data and intervening where 'machine generated decisions'[133] need human oversight. Otherwise, one bad experience can outweigh all positive ones and lead to disengagement.

11.3 Impact on the self-assessment system

Tax administrations use either:

- a self-assessment system (SAS), where the onus is on the taxpayer to ensure the filing of documents, such as tax returns, complies with tax laws; or
- an administrative assessment system (AAS), where the onus is on the tax administration to examine documents filed, calculate the amount of tax payable and notify the taxpayer of their tax liability.[134]

It is fair to say that the SAS has become the key administrative collection system for both personal and corporate taxation in developed countries, including Australia. This is largely due to the administrative burdens of the AAS. For example, it is reported that by the early 1980s 'the need to process tax refunds quickly had placed considerable strain on the Tax Office's resources'.[135] There were ten million returns from individuals to assess annually, with an average of one minute of scrutiny on each return.[136] SAS was introduced in Australia in 1986-87 for individual taxpayers, 1989-90 for companies and superannuation funds, and 2012 for indirect taxes.

Self-assessment is based on the idea of voluntary compliance, where the role of tax administrations is to 'first and foremost assist … taxpayers to understand their rights and obligations under the law'.[137] In Australia, the ATO focuses on helping the taxpayer get things right by mechanisms such as private rulings, public rulings, guidance products and a tax help program for low-income individuals.[138]

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[131] Henry Belot, 'Centrelink: Tax Office Says It Cannot Be Blamed For Automated Debt Recovery System's Failings' *ABC News* online (8 March 2017), available at: http://mobile.abc.net.au/news/2017-03-08/tax-office-cannot-be-blamed-for-centrelink-robodebt-failings/8335170 (accessed 8 January 2018).
[132] Victoria Legal Aid, 'Get Help With Centrelink's "Robo Debts"', http://www.legalaid.vic.gov.au/find-legal-answers/centrelink/get-help/get-help-with-centrelinks-automated-debts (accessed 26 January 2019).
[133] Houser and Sanders, above n 2, 817.
[134] Andrew Okello, 'Managing Income Tax Compliance Through Self-Assessment' (IMF Working Paper WP/14/41, March 2014) 9.
[135] Australian Treasury, *Review of Aspects of Income Tax Self Assessment: Discussion Paper* (March 2004) 2.
[136] Ibid.
[137] Okello, above n 134, 11.
[138] ATO, 'Self-Assessment and the Taxpayer', https://www.ato.gov.au/individuals/ind/self-assessment-and-the-taxpayer/ (accessed 22 January 2018).

An SAS traditionally means a shift of emphasis from pre- to post-filing verification activities, such as risk-based audits.[139] SAS shifts the responsibility to compute tax payable from the tax authorities to the taxpayer.[140]

On the other hand, an AAS is considered costly because of staff resources and time, inefficient as less tax is collected overall because of insufficient focus on the highest revenue risks, litigious as there are high levels of disputes, and unhelpful as taxpayer education and assistance programs are often not well developed.[141]

There is a question as to whether the increasing use of data and analytics to embed, prevent and even pre-empt non-compliance is reflective of an SAS. Singapore's IRAS, for example, has an AAS called the Official Assessment System (OAS). The system is 'primarily founded upon the technological edge that the country possesses to capture data required for tax assessment from the source instead of the taxpayer, and electronic data matching with data from external sources'.[142]

With increased automation and ability to use data and analytics to ensure that the right amount of tax is being paid, it could be argued that, in Australia, a full circle has been travelled from AAS to SAS and back to AAS. However, the AAS is modified because taxpayers still need to ensure all information is included in their returns[143] and ensure they keep records. Also, having had an SAS foundation for 30 years, the ATO has developed a focus on client service, so the helpful assistance which is not normally associated with an AAS system is present.

The ATO Blueprint considers that the ATO is in a 'streamlined self-assessment'[144] era. It may even be that SAS and AAS are no longer concepts in tax administrations in the future.

Meanwhile, countries such as Australia may be moving away from a traditional SAS but, with the increase of data and analytics, a good hybrid emerges – a system where it is easier to comply and harder not to comply, on a foundation of voluntary compliance.

11.4 Staff capability

When the author joined the ATO in 1999 there were a handful of disciplines offered as entry into the graduate program, law and accounting being the major relevant fields of study. Now the ATO offers entry into the graduate program for students of disciplines such as information technology, data-mining, computer science, machine learning and statistics, recognising that '[w]e are increasingly making use of data science with advanced analytics – techniques such as predictive modelling, machine learning, data

[139] Okello, above n 134,11-12.
[140] Natrah Saad, 'Tax Knowledge, Tax Complexity and Tax Compliance: Taxpayers' View' (2014) 109 *Procedia – Social and Behavioural Sciences* 1069.
[141] Okello, above n 134, 9-10.
[142] Ibid 11.
[143] This is the case even in Singapore with an AAS type system (see section 8.1.2).
[144] See ATO, 'Reinventing the ATO Program Blueprint', https://www.ato.gov.au/about-ato/managing-the-tax-and-super-system/in-detail/reinventing-the-ato-program-blueprint/ (accessed 26 January 2019).

mining and prescriptive analytics – to optimise services to taxpayers, improve the client experience, and protect revenue'.[145]

This is consistent with the ATO trend to develop its data capability in Smarter Data and the Office as a whole. As such, it is updating the whole of the ATO's capability framework. This is in line with the Australian Public Service Commission (APSC) recommendations on public service data literacy. The APSC states that '[d]ata skills are essential for all Australian Public Service (APS) employees to support evidence-based, informed decision making'.[146]

The APSC has developed a four-component framework to empower the APS to harness the value of data and increase data literacy across all levels of the APS:

- Data Fellowship program;
- University courses;
- APS Data Literacy program; and
- Data training partnerships.[147]

The UK government is also developing a data literacy program as it recognises there is a shortage of key data-science skills in government. 'The digital academy will provide skills training right across government for up to 3,000 people a year'[148] for staff who are not data specialists.

Many other tax administrations employ data scientists, chief analytics officers and system analysts.[149] For existing staff, they engage educational institutions such as universities to arrange technical training.[150]

Considering that, except in the Asia-Pacific, workers aged over 45 years are over-represented in tax administration,[151] it is important to provide contemporary training for existing staff to help maximise the benefits of data and analytics. The learning and disciplines in data and analytics being taught at higher education institutions are vastly different today from their content two decades ago.

11.5 Third parties

Tax administrations have varying relationships with third parties when implementing data and analytics to engage with taxpayers.

In Australia, agents are still used 67 per cent of the time for individuals and 92 per cent of the time for small businesses.[152] It is observed, however, that the landscape is shifting for the types of tax services that agents provide, due to technology such as online

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[145] ATO, 'The ATO Graduate Program', https://www.ato.gov.au/about-ato/careers/entry-level-programs/the-ato-graduate-program/ (accessed 27 February 2018).
[146] Australian Public Service Commission, 'Data Literacy skills', http://www.apsc.gov.au/learn-and-develop/aps-data-literacy (accessed 6 February 2019).
[147] Ibid.
[148] Manzoni, above n 125.
[149] OECD, *Tax Administration 2017*, above n 9, 134.
[150] Ibid 135.
[151] Ibid 127.
[152] Commissioner of Taxation, *Annual Report 2016-17*, above n 82, 15.

services and data pre-filling.[153] The challenge for tax administrations is to work with intermediaries who may feel their traditional roles are being encroached upon. Data and analytics tools and services should also be shared with tax agents, as they can play an important role in influencing their clients' tax compliance behaviour.[154]

There is an increase in sharing data and analytics with governments, both internationally and domestically, some examples of which have been discussed in section 10.2 above. Tax administrations have opportunities to work with and share data and analytics at the whole-of-government level. It has been observed that taxpayers support integrated services.[155] To increase transparency and sharing of data, it has been suggested that it may be helpful to produce a compendium and commentary on the different data sources used by countries from both internal and external sources, including other parts of government.[156]

Tax administrations are increasingly engaging with a variety of software providers, including smaller companies as these are agile and able to experiment with data and analytics in short turnaround times.[157] Some of this work is to help integrate data and analytics into natural systems. For example, the Danish Tax Administration is collaborating with software developers to embed tax-related guidance and functionality in third party accounting software solutions targeting small businesses.[158] This integration can enable any issues to be identified prior to or during lodgement, potentially reducing the need for post-filing audits.[159] In Australia, the ATO imports data from the *myDeductions* app into the tax return, which enables deductions that have been recorded in real time to be automatically entered into the tax return when lodgement is due.[160]

12. CONCLUSION

There is evidence that data and analytics are being leveraged to successfully prevent/pre-empt compliance issues for individuals through pre-filled tax returns, nudge theory and predictions of non-payment. However, there are current limitations such as type, accuracy and availability of data which need to be tempered if they are to be expanded to other taxpayers such as small businesses.

The UK is using data and analytics and natural systems to embed tax obligations in digital tax accounts, to the point where returns will not be necessary for individuals and small businesses. The 'single view of taxpayer' promises to be the most developed tool

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[153] OECD, *Tax Administration 2017*, above n 9, 68.
[154] OECD, *Increasing Taxpayers' Use of Self-Service Channels*, above n 66, 35.
[155] Chris Jordan (Commissioner of Taxation), 'Better Services and A Better Experience for Australians' (Address to the 12th International Conference on Tax Administration, Sydney, 31 March 2016), https://www.ato.gov.au/Media-centre/Speeches/Commissioner/Better-services-and-a-better-experience-for-Australians/ (accessed 26 January 2019).
[156] OECD, *The Changing Tax Compliance Environment*, above n 17, 91.
[157] Sholto Macpherson, 'ATO Plans For Near Real-Time Profiling by 2016' *Digital First* (13 May 2015), available at: https://digitalfirst.com/ato-plans-near-real-time-profiling-2016/ (accessed 7 January 2018).
[158] OECD, *Tax Administration 2017*, above n 9, 73.
[159] OECD, *The Changing Tax Compliance Environment*, above n 17, 44.
[160] ATO, 'Pre-Filling Your Online Tax Return', https://www.ato.gov.au/individuals/lodging-your-tax-return/lodge-online/pre-filling-your-online-tax-return/ (accessed 8 January 2018).

to engage taxpayers in the tax system in real time. It is expected that this will be an ongoing development for tax administrations in their data and analytics strategies.

For businesses, there has been a shift from using data solely for auditing purposes to optimising its use to provide certainty of tax obligations, which could be perceived as 'goodwill' by taxpayers[161] and promote an increase in engagement. Tax administrations are engaging early and moving compliance upstream through products such as benchmarking, cooperative compliance, sharing of risk profiles and pre-lodgement compliance reviews. Transparency between companies, tax administrations, governments and even across jurisdictions is expanding in terms of data and information. This provides more opportunities for tax administrations to develop initiatives in order to help taxpayers comply.

Further downstream are data-matching and risk-profiling of taxpayers with their obligations, but these are increasingly becoming more closely targeted. This means those who are complying or low risk are not subject to auditing processes, although it is recognised that random audits will be used by 'some tax administrations to build a wider picture of tax risks, helping to ensure that risk models adapt and are therefore accurate and up to date'.[162] Also, learnings from post-event activity such as data-matching can be used for education upstream to help taxpayers get things right earlier.

How different data and analytics initiatives may work to engage taxpayers is also dependent on the socioeconomic, political and legal frameworks, which vary between tax administration jurisdictions. For example, privacy concerns are more of an issue for taxpayers in some jurisdictions than others, and having extensive pre-filling works more easily for some jurisdictions more than others because they do not have comprehensive regimes for claiming deductions.

What is evident is that data and analytics are used predominantly for better management and assessment of tax risks, and improving pillars of compliance such as correct reporting and collecting debt. For taxpayers, they are enabling some proactive services, such as pre-filled tax returns and pre-lodgement compliance checks. However, the use of data and analytics, especially prescriptive analytics which examines the root causes of behaviour,[163] could be expanded to improve taxpayer services. Examination of why a taxpayer applies for a ruling or makes a mistake on their return could provide insights to improve compliance and encourage willing participation.

The next decade will undoubtedly be transformative for data and analytics[164] in tax administrations. Increases in the transparency and availability of data, analytics that tailor interactions to taxpayer circumstances, and the focus from governments on the importance of staff capability all lend themselves to opportunities that increase taxpayer engagement and allow them to more easily reach the compliance finish line.

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[161] Binh Tran-Nam and Chris Evans, 'Managing Tax System Complexity: Building Bridges Through Pre-Filled Tax Returns' (2010) 25(2) *Australian Tax Forum* 245.
[162] OECD, *The Changing Tax Compliance Environment*, above n 17, 72.
[163] Such as those being used for debt management strategies.
[164] OECD, *Tax Administration 2017*, above n 9, 64.