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EDITORS' NOTE

The *eJournal of Tax Research* is a refereed journal that publishes original, scholarly works on all aspects of taxation. It aims to promote timely dissemination of research and public discussion of tax-related issues, from both theoretical and practical perspectives. It provides a channel for academics, researchers, practitioners, administrators, judges and policy makers to enhance their understanding and knowledge of taxation. The journal emphasises the interdisciplinary nature of taxation.

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Submission of original contributions on any topic of tax interest is welcomed, and should be sent as an email attachment (Microsoft Word format) to the Production Editor at <ejtr@unsw.edu.au>. Submission of a manuscript is taken to imply that it is an unpublished work and has not already been submitted for publication elsewhere. Potential authors are requested to follow the "Notes to Authors", which is available from the journal's website.

WEBPAGE

Current and past issues of the *eJournal of Tax Research* are available via the journal's website: https://www.unsw.edu.au/business/our-research/research-environment/ejournal-tax-research.

Editorial announcement

Emeritus Professor John Taylor decided to resign from his position as co-editor of the *eJournal of Tax Research* (*eJTR*) in September 2021. John was a co-editor of the *eJTR* from late 2013 to September 2021, covering Issue 3, Volume 10 to Issue 1, Volume 19. In that role, he has made important contributions to the development of the *eJTR* in its second decade of existence. I have enjoyed working with John and wish to take this opportunity to wish him all the best in his 'retirement'. I strongly hope that John will continue his association with the *eJTR* in his capacity as a reviewer.

I also indicated to Professor Paul Andon, Head of School of Accounting, Auditing and Taxation, that I intend to resign from my position as a co-editor of the *eJTR* after the publication of Issue 1 of Volume 20 of the *eJTR*. In response, Professor Andon has appointed three new co-editors: Dr Alexandra Evans, Dr Youngdeok Lim and Associate Professor Yan Xu, for a five-year term, commencing on 1 January 2022. I would like to warmly congratulate Alex, Youngdeok and Yan on their appointments. I am confident that the new highly capable and multidisciplinary editorial team will provide the vision, energy and dedication to take the journal forward into its third decade.

In addition, Professor Andon also decided to expand the Editorial Board of the *eJTR*. To this end, he appointed Professors Lisa Marriott (University of Victoria, Wellington), Helen Hodgson (Curtin University), Fiona Martin (UNSW Sydney), Natalie Stoianoff (University of Technology Sydney) and Jennie Granger (UNSW Sydney) to the Editorial Board, also for a five-year term, commencing on 1 January 2022. I congratulate Lisa, Helen, Fiona, Natalie and Jennie on their new role. Their appointments not only help to diversify the Editorial Board but also rejuvenate it.

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Fairness, legitimacy, and tax compliance

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Abstract

Tyler (2006 [1990]) theorises that perceptions of the legitimacy of a legal authority mediate the influence of fairness on individuals' compliance with the law. We apply Tyler's theory to the tax context to further our understanding of the association between taxpayers' fairness perceptions and compliance. We consider both distributive and procedural fairness. Our experimental results, using data from 389 American taxpayers, suggest that distributive fairness and procedural fairness encourage taxpayers' compliance, and that these fairness effects are additive. Furthermore, we find that perception of legitimacy mediates the relation between each type of fairness and compliance, and, by so doing, increases taxpayers' propensity to pay their taxes.

Key words: distributive fairness, procedural fairness, legitimacy, tax compliance

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1. INTRODUCTION

'Above all, in a democracy the tax system must be fair and be seen to be fair' (Brown & Mintz, 2012, 1:2). Fairness is a comparative judgment based on actual or imagined reference points (Folger & Cropanzano, 2001). Individuals who perceive fairness are more likely to be satisfied and tend to be cooperative, whereas individuals who perceive unfairness are more likely to be resentful and tend to be uncooperative (Skarlicki & Folger, 1997). As specifically applied to tax compliance, it is believed that fairness perceptions influence taxpayers' cooperation with tax authorities and increase their tendency to pay their taxes. This is important because governments are dependent on a high degree of voluntary compliance with tax laws. Enforcement measures to collect income tax are costly and would be essentially unmanageable in the face of large-scale failure to comply.

Two important dimensions of fairness are distributive fairness, which refers to the fairness of outcomes experienced by individuals relative to others, and procedural fairness, which refers to the fairness of the process by which an outcome occurs (Van den Bos, Vermunt & Wilke, 1997).[1] As applied to the tax setting, outcomes could include tax rates, taxable income, allowable deductions, and tax assessed. If a tax outcome is perceived as fair – as compared to 'referent others' in similar circumstances – distributive fairness occurs. Procedural fairness relates to the just and even-handed processing of tax returns and/or resolving of disputes.

While prior research provides some support for the relevance of distributive fairness to taxpayers' compliance, (e.g., Hartner-Tiefenthaler et al., 2012; Kim, Evans & Moser, 2005; Moser, Evans & Kim, 1995; Verboon & Van Dijke, 2007), as well as procedural fairness to tax compliance (e.g., Gobena & Van Dijke, 2016; Murphy, 2005; Murphy, Bradford & Jackson, 2016; Van Dijke & Verboon, 2010; Verboon & Van Dijke, 2012), an integrated understanding of the relative importance and joint influence of procedural and distributive fairness remains outstanding, even though fairness researchers have identified the need for further investigation (Skitka, Winquist & Hutchinson, 2003; Sweeney & McFarlin, 1993). Thus, the first objective of this research is to investigate the influence of both distributive and procedural fairness in influencing tax compliance, their relative importance, and the possible interplay between them. Both dimensions of fairness can occur simultaneously in the assessment of a return or in a tax dispute, but *ex ante* it is not known whether one type of fairness would potentially be more important than another, whether order of receiving different types of fairness information would matter, or whether one type of fairness would enhance or undermine another or act independently of the other. These issues cannot be assessed without incorporating both types of fairness in the same study.

The second objective of this study is to investigate the potential role of legitimacy as a mediator between each of distributive and procedural fairness and tax compliance. In his theory on compliance, Tyler (2006 [1990]) proposes that fairness influences compliance with the law indirectly through its impact on citizens' perceptions of legitimacy of the legal authority. Legitimacy means that citizens feel obligated to obey

[1] Bies and Moag (1986) also identify interactional fairness as a third dimension of fairness. Interactional fairness refers to interpersonal considerations during an interpersonal encounter, such as courtesy. Prior research (Farrar, Kaplan & Thorne, 2019) has established the influence of interactional fairness on taxpayers' compliance and is not considered in the scope of our study.

group rules and the decisions of group authorities (Tyler, 1997). Legitimacy also encompasses the extent to which an authority does its job well, i.e., receives a favourable evaluation (Tyler, 1997). In a tax context, Tyler's theory would translate to the idea that taxpayers' experience of procedural fairness (or unfairness) and/or distributive fairness (or unfairness) would impact their perceptions of legitimacy of the tax authority, which would, in turn, influence future compliance with tax laws. Using samples of tax offenders, Murphy (2005) and Murphy et al. (2016) empirically studied the role of procedural fairness and legitimacy on tax compliance, but to our knowledge, no researchers have examined more broadly whether legitimacy perceptions mediate the association between each of distributive fairness and procedural fairness on tax compliance intentions.

To address our research objectives, we conduct an experiment in which 389 taxpayers provide assessments of tax compliance intentions and their perceptions of the legitimacy of the tax authority after reading a tax scenario in which perceptions of distributive fairness and procedural fairness are manipulated. We find that both distributive and procedural fairness significantly influence compliance intentions and that the order of receiving the distributive versus procedural fairness information has no effect on compliance. We find that neither type of fairness is more important than the other in its influence on compliance and that the effects of fairness are additive in that situations having both procedural and distributive fairness result in greater compliance intentions than those lacking one (or both) of these types of fairness. We find that legitimacy fully mediates the relation between both types of fairness and compliance.

Our first contribution to the tax literature is that we provide evidence on the influence of distributive and procedural fairness on tax compliance and their relative and combined effects. Our second contribution is that we shed light on the process through these influences occur, demonstrating the involvement of perceived legitimacy of the tax authority, thereby providing support for Tyler's (2006 [1990]) theory on compliance. To our knowledge no researchers have previously demonstrated the mediating effect of legitimacy on the relationship between distributive fairness and compliance and no researchers have previously used a controlled experiment to study the mediating effect of legitimacy on the relationship between fairness and tax compliance. Finally, we contribute to the tax fairness literature by showing an approach to separating the influence of distributive fairness separate from the favourability of an outcome.[2] Through this exploration, we increase our understanding of complex factors that encourage taxpayers to voluntarily comply with tax law (see McKerchar, Bloomquist & Pope, 2013).

The remainder of the article is organised as follows. In the next section, we describe the literature and theoretical perspectives pertaining to distributive fairness and procedural fairness, as well as the role of legitimacy in influencing fairness perceptions and compliance. We then formulate hypotheses. Section 3 describes our experiment, while section 4 reports the results. We conclude with a discussion of the implications of our findings for fairness researchers, tax researchers, and tax authorities.

[2] Prior fairness literature has, at times, confounded the impact of outcome favourability (positive vs. negative outcomes) with distributive fairness (see Skitka et al., 2003).

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

In this section, we review the fairness and tax literatures for theoretical and empirical evidence regarding the relationship between each of distributive fairness and procedural fairness and tax compliance, and the potential mediating role of legitimacy. We draw on Tyler's (2006 [1990]) theory on compliance that was developed to explain why people obey the law and consider it from a tax law perspective.

2.1 Procedural and distributive fairness and tax compliance

Generally, social psychologists find evidence that compliance is influenced by individuals' views of fairness and unfairness (Tyler, 1997). Judgments about what is fair are at the heart of feelings, attitudes, and behaviours in individuals' interactions with others (Tyler, 1997). People care about fairness because it is a basic human need across social contexts (De Cremer & Blader, 2006). People respond favourably and are more likely to comply in the presence of fairness and are less likely to comply when they perceive unfairness (Skarlicki & Folger, 1997).

Feelings of distributive fairness or unfairness generally arise from a comparison of one's own outcome to the outcome of a referent other and reflects the ideal that outcomes ought to be distributed fairly amongst individuals (for example, see Adams, 1963; 1965; Ferguson et al., 2014; Van den Bos et al., 1997). The tax literature contains a small group of studies that investigate the potential influence of examples of distributive fairness on tax compliance. For example, using an experimental approach (MBA student participants), Moser et al. (1995) studied (in part) the compliance impact of a belief that one's tax rate is higher than some other participants in the experiment (horizontal inequity, which is a form of distributive unfairness). They did not find a difference in compliance between these participants and those who were told that their tax rate was the same as others. They did, however, find that the increases in tax rates (proxying for exchange inequity, which relates to a perceived imbalance between taxes and government services received) affected compliance in the group suffering from horizontal inequity more than those experiencing horizontal equity. In other similar experiments, Trivedi, Shehata and Lynn (2003) found that horizontal inequity sometimes affected compliance and sometimes did not. Kim et al. (2005) found that exchange inequity affected compliance. In a survey, Wenzel (2002) observed an association between general feelings about distributive fairness of the tax system and tax compliance for some forms of tax compliance. In other survey research, Verboon and Van Dijke (2007) and Hartner-Tiefenthaler et al. (2012) found that their measures of distributive fairness (general measure of feelings of distributive fairness and feelings of fairness relating to subsidies of other European Union countries, respectively) were associated with tax compliance. But in another survey-based study, Kirchler, Niemirowski and Wearing (2006) found no significant association of tax compliance with horizontal and vertical fairness, nor with exchange equity.

Although the evidence is mixed, possibly due to these studies utilising differing examples of distributive fairness, we believe there is a sufficient basis to hypothesise a causal relationship between distributive fairness and tax compliance:

H1: *Perceptions of distributive fairness lead to higher taxpayer compliance intentions than do perceptions of distributive unfairness.*

Recall that the construct of procedural fairness relates to perceptions of the fairness of the process leading to an outcome (see Leventhal, 1980; Thibault & Walker, 1975; Van den Bos et al., 1997). The tax literature contains several studies that examine the relationship between various measures of procedural fairness and tax compliance. The survey-based studies of Gobena and Van Dijke (2016; 2017), Murphy (2004; 2005), Murphy, Bradford and Jackson (2016), Murphy, Tyler and Curtis (2009), Porcano (1988), Van Dijke and Verboon (2010), and Verboon and Van Dijke (2011) observed a positive association between procedural fairness and tax compliance. Wenzel (2002) observed a positive association for only one of his measures of compliance. In experimental studies on university students, Van Dijke and Verboon (2010) and Verboon and Van Dijke (2012) found that procedural fairness influenced tax compliance. Thus, there appears to be sufficient basis to hypothesise a causal relationship between procedural fairness and tax compliance:

H2: *Perceptions of procedural fairness lead to higher taxpayer compliance intentions than do perceptions of procedural unfairness.*

While fairness scholars agree that distributive fairness and procedural fairness are distinct constructs (Ambrose & Arnaud, 2005; Greenberg, 1990; Hartman et al., 1999; Konovsky, 2000), there is no scholarly consensus as to how these two types of fairness affect behaviour in combination. Some fairness scholars (in non-tax contexts) state that there is empirical evidence of an interactive impact of procedural fairness and distributive fairness (e.g., Konovsky, 2000; De Cremer, 2005),[3] but what they have found instead is an interactive effect of procedural fairness and outcome favourability, rather than an interactive effect of procedural fairness and distributive fairness (see also Brockner, 2002; Brockner & Wiesenfeld, 1996; 2005). As Skitka et al. (2003, p. 314) state, '[c]omparisons of the relative effects of procedural and distributive fairness as currently presented in the literature are often comparisons between the relative power of procedural fairness and outcome favorability'.[4] In light of this challenge, we develop a distributive fairness manipulation that varies distributive fairness while holding outcome favourability constant to avoid confounding the two constructs.

We are aware of only two tax studies (Porcano, 1988; Wenzel, 2002) that include both distributive fairness and procedural fairness, but neither study considered the potential for an interactive effect of these two types of fairness. We did find a non-tax study that experimentally manipulates both distributive fairness and procedural fairness (Van den Bos et al., 1997). Van den Bos et al. (1997) observed an effect of procedural fairness on participant behaviours, but only when participants did not have information about distributive fairness.

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[3] Konovsky (2000, p. 504) states, '[i]f the negative event included unfair procedures, this heightens people's sensitivity to the outcomes they received. If a negative outcome was received, this heightens people's sensitivity to the procedures used to determine the outcome. This heightened sensitivity is manifested by the interaction effect of PJ [procedural fairness] and DJ [distributive fairness]'. De Cremer (2005, p. 6) states, '[t]he frequently observed interaction between distributive fairness and procedural fairness will predict employee's cooperation … Thus, one could predict that procedural fairness matters most when outcomes are unfavorable…'.

[4] Researchers at times have confused the notions of distributive fairness with outcome favourability. Distributive fairness and outcome favourability are empirically and theoretically distinct constructs (Skitka et al., 2003). In a tax context, distributive fairness refers to a taxpayer's outcome relative to the tax outcomes of others, whereas outcome favourability refers to how favourable or unfavourable a tax outcome is (Wenzel, 2002).

We do not believe that the empirical or theoretical literature provide a sufficient basis to hypothesise on whether there would be an interaction between the two types of fairness. This gap in the literature does not take away the value of learning what their combined effect might be. Rather than stating a hypothesis, we pose a research question, as follows:

RQ: *How do perceptions of distributive fairness and procedural fairness combine to influence taxpayers' compliance?*

2.2 The potential mediating role of legitimacy

Our final two hypotheses consider the role of legitimacy in mediating the association between fairness and taxpayers' compliance. In his theory on compliance, Tyler (2006 [1990]) suggests that taxpayers' motivation to comply with tax laws relates to taxpayers' feelings about the authorities who prescribe and enforce the law. He proposes that citizens' beliefs about the legitimacy of a legal authority (including a tax authority) provide a key motivation for following the laws prescribed by this authority. Turner (2005, p. 8) describes 'legitimate authority' as 'control based on the acceptance by the target of one's right to prescribe their beliefs, attitudes or actions'. Tyler (1997) shows that legitimacy is based on a citizen's obligation to obey an authority as well as the extent to which that authority does its job well. Kirchler, Hoelzl and Wahl (2008) and Wahl, Kastlunger and Kirchler (2010) argue that when a tax authority's power is legitimate, that authority is more likely to be trusted and complied with. Tyler and Fagan (2008) further argue that fairness is an important determinant of perceptions of the legitimacy of that authority: when people perceive fairness, they view legal authorities as more legitimate and entitled to be obeyed, and as a result, people become self-regulating and assume a personal responsibility to follow rules. Therefore, the theory on compliance proposes that citizens' perceptions of the fairness influence their perceptions of the legitimacy of the authority, which, in turn, influences their compliance with the law (Tyler, 2006 [1990]).

In the tax context, two survey-based studies have explored how tax authority legitimacy perceptions may mediate the relationship between procedural fairness perceptions and tax compliance intentions. Murphy (2005) provides evidence of a positive association between perceptions of procedural fairness, legitimacy and compliance, based on self-reports of Australian tax offenders. Subsequently, Murphy et al. (2016) reported on a follow-up survey of the tax offenders, and likewise found evidence that perceived legitimacy may mediate the relationship between procedural fairness and compliance. The fact that all the participants in the Murphy (2005) and the Murphy et al. (2016) studies were tax offenders may affect the generalisability of these results to the general taxpayer population (that is, they are drawing from a sub-population with poor tax compliance). These studies were conducted in more than one wave to provide evidence concerning whether procedural fairness has a causal relationship with tax compliance through legitimacy. Even so, an experiment can provide more conclusive evidence about causation.

It should be noted that Tyler's (2006 [1990]) theory includes impact of *both* procedural fairness and distributive fairness on compliance with the law. However, empirically it is challenging to capture distributive fairness, particularly in survey-based research which accounts for the bulk of the empirical research on Tyler's theory. As a result, theoretical and empirical research relying on Tyler's (2006 [1990]) model has largely abandoned distributive fairness and focused nearly entirely on procedural fairness.

McLean (2020) observes that the result of this turn of events has been a lack of development of Tyler's theory as it relates to distributive fairness. This issue can be seen in Murphy (2005) and Murphy et al. (2016) in that they study procedural fairness only in their test of Tyler's theory.

We extend the work of Murphy (2005) and Murphy et al. (2016) in three ways: 1) we incorporate distributive fairness; 2) we use an experimental approach to provide causal evidence about the influence of both distributive and procedural on taxpayers' compliance through their beliefs in the legitimacy of the tax authority; and 3) we use a broad sample of taxpayers who are not known to be non-compliant. Our remaining hypotheses are:

H3: *Perceptions of tax authority legitimacy mediate the relation between distributive fairness and taxpayers' compliance intentions. Specifically, distributive fairness positively influences perceptions of legitimacy of the tax authority, which is positively associated with compliance intentions.*

H4: *Perceptions of tax authority legitimacy mediate the relation between procedural fairness and taxpayers' compliance intentions; specifically, procedural fairness positively influences perceptions of legitimacy of the tax authority, which is positively associated with compliance intentions.*

3. EXPERIMENT

3.1 Design

Our study utilises a 2 x 2 x 2 between-participants design. Our design fully crosses distributive fairness (fair or unfair), procedural fairness (fair or unfair), and the order in which fairness information is received (distributive first or procedural first). Participants were given a scenario in which they read about a taxpayer and his experiences with the Internal Revenue Service (IRS). The scenario manipulated distributive fairness, procedural fairness, and the order in which fairness information was presented. We manipulated and examined the effect of order in which fairness information was presented because Van den Bos et al. (1997) observed an order effect in a non-tax context.

3.2 Participants

Participants were recruited by a consumer research firm that has a database of 4 million Americans. To ensure that our sample was representative of a typical taxpayer population, we requested our participants be randomly selected using two parameters: gender and age. We restricted our sample participants to adult taxpayers between the ages of 25 and 80, evenly distributed across age groups, with a 50/50 gender split. We requested 50 responses per experimental condition, for a total of 400 taxpayers. Four hundred and eight taxpayers completed the instrument, and of these, 19 responses contained missing information, and were deleted, leaving a final sample of 389 (200 men and 189 women, with an average age of 49.1 years, who had filed tax returns for an average of 26.7 years). Demographic profile statistics are in Table 1.[5]

[5] We compared our sample against US census data that segmented the US population according to income, education and age. Our sample distribution was similar to that of the US population. For income, we

Table 1: Demographic Profile Statistics

Sample size	n = 389
Gender	
male	n = 200 (51.4%)
female	n = 189 (48.6%)
age	mean = 49.1 years std dev = 14.5 years
years filed a tax return	mean = 27.0 years std dev = 15.7 years
Unpleasant Encounter with IRS?	Yes = 61 (15.7%) No = 328 (84.3%)
Income:	
less than $25,000	n=61 (15.7%)
between $25,000 and $50,000	n=91 (23.4%)
between $50,001 and $75,000	n=68 (17.5%)
between $75,001 and $100,000	n=75 (19.3%)
greater than $100,000	n=72 (18.5%)
prefer not to answer	n=22 (5.6%)
Highest level of education completed:	
high school	n = 102 (26.2%)
junior college diploma	n = 33 (8.5%)
college degree	n = 138 (35.5%)
graduate degree	n = 103 (26.5%)
other	n = 13 (3.3%)
Tax preparer	
Taxpayer	n = 190 (48.8%)
Taxpayer's spouse/partner	n = 28 (7.2%)
Paid preparer	n = 145 (37.3%)
Other	n = 26 (6.7%)

checked 'Income and Poverty in the United States: 2013' (DeNavas-Walt & Proctor, 2014, p. 23). Our sample was underweighted in the under USD 25,000 and in the greater than USD 100,000 categories by about 7%, and overweighted in the USD 75,000 – USD 100,000 category by about 7%. For education, we checked 'Educational Attainment in the United States: 2014' (Census, 2014). Our sample was overweighted in graduate education by about 15%. Neither of these differences appear to significantly affect the results, since neither income nor education are significant covariates.

3.3 Experimental procedures

Participants received an email invitation from the firm to participate in a questionnaire about income taxes and were assigned a unique user ID and password provided by the firm, ensuring they could complete only one questionnaire, and were incentivised by a point system specific to the firm. After being randomly assigned to experimental conditions, participants read a scenario and answered questions pertaining to the dependent variable, as well as other questions about potential control variables (social norms, detection likelihood, whether the participant had ever had an unpleasant encounter with an IRS agent), and demographic information (age, gender, number of years filing a tax return, tax preparer, education, and income).

In all versions of the scenario, the taxpayer received an unfavourable outcome, in which a deduction was denied, since fairness perceptions are more likely to be activated in the presence of unfavourable outcomes (Mullen, 2007; Rutte & Messick, 1995). We were careful to distinguish the favourability of the outcome from the distributive fairness of that outcome (see Skitka et al., 2003), since we manipulated distributive fairness by having the taxpayer's unfavourable outcome compared with referent others (outcomes of other, similar taxpayers).

Initially, participants read the following:

> Below is a brief scenario about a taxpayer named Jamie and his experiences with the Internal Revenue Service (IRS). Please read it carefully, as you will be asked some follow-up questions. We would like to know what you would do if you were Jamie.

Next, participants were given a scenario to read. Common to all scenarios was the following:

> Jamie is a small business owner. Last year, he had a lengthy and frustrating dispute with the IRS concerning a tax deduction. In the end Jamie was disappointed to find out that he was not allowed to claim the full deduction.

Participants were then given information about distributive fairness followed by procedural fairness, or procedural fairness followed by distributive fairness, depending on the experimental condition for order. In the distributively fair condition, participants read the following: *Jamie believed that his tax result was fair compared to other situations he had recently heard of*. In the distributively unfair condition, participants read the following: *Jamie believed that his tax result was unfair compared to other situations he had recently heard of.*[6] In the procedurally fair condition, participants read the following: *He believed that the IRS process to resolve the dispute was fair.* In the procedurally unfair condition, participants read the following: *He believed that the IRS process to resolve the dispute was unfair.*[7]

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[6] We used the term 'tax result' as a synonym for 'tax outcome' to reflect the notion of distributive fairness referring to the fairness of the tax outcome. This wording was successfully tested in several pre-tests.

[7] To improve the flow, we added the following continuums or adverbs before the distributive or procedural manipulations: 'even so', 'also', and 'at the same time'. For example, in the experimental condition which contained distributive unfairness followed by procedural fairness, the scenario stated, 'Jamie believed that his tax result was unfair compared to other situations he had recently heard of. At the same time, he believed that the IRS process to resolve the dispute was fair'.

In this study, we directly manipulate the fairness perceptions in our scenario rather than by utilising specific examples of outcomes/processes, as doing so may lead to differing participant perceptions about the degree of fairness involved. This approach also minimises the risk that providing a specific example of distributive or procedural fairness would obscure interpretation of the results and/or the extent to which they generalise. For distributive fairness, there is empirical evidence that taxpayers respond differently, depending on the specific example utilised in the study (e.g., Kim et al., 2005; Moser et al., 1995; Trivedi et al., 2003). We made the information about distributive fairness as similar as possible to the type of not-very-specific information that may be available about other taxpayer situations. For procedural fairness, there is empirical evidence that taxpayers respond differently, depending on the type of specific procedural operationalisation (Worsham, 1996).

The next screen contained questions about compliance intentions, in which participants read the following:

> This year Jamie's income included some cash earnings. Jamie knows that it is more difficult for the IRS to find out about cash income.

3.4 Dependent variable: compliance

Compliance was measured using the average scores of a four-item scale. Participants responded using a 7-point Likert scale (where 1=strongly disagree and 7=strongly agree). The items were, 1) *Under the circumstances, Jamie might not report all of his cash earnings on his tax return*; 2) *Jamie will not declare all the cash to the IRS*; 3) *Jamie is unlikely to report all his cash earnings to the IRS*; and 4) *Jamie would be tempted to not report all of his cash receipts on his tax return*. The Cronbach's alpha of this scale is 0.86, which is excellent (Nunnally, 1978). We reverse-coded this variable; therefore, higher scores indicate higher compliance intention and lower scores indicate lower compliance intention.

3.5 Mediating variable

Legitimacy was measured using the average scores of a two-item scale, based on Murphy (2005), which is adapted from Tyler (1997).[8] The items were as follows: 1) *Jamie's circumstances would lead him to believe that the IRS does its job well*; and 2) *Jamie's circumstances would lead him to feel that it is important to follow the IRS's rules.* The Cronbach's alpha of this scale is 0.77, which is good (Nunnally, 1978).

3.6 Control variables

We controlled for several socio-economic variables which have been used in prior tax compliance research. Specifically, we asked demographic questions about gender, age, work experience, number of years filing a tax return, tax preparer, education, and income, consistent with other tax compliance studies (e.g., Bobek et al., 2007; Marriott, Randal & Holmes, 2013). We also controlled for social norms and measured social

[8] Tyler (1997, p. 337) notes that there are three elements of legitimacy: the willingness to voluntarily accept decisions, obedience toward the rules/laws, and favourable evaluations of authorities. Murphy (2005) developed two legitimacy scales adapted for the tax context, corresponding to the second and third elements of legitimacy identified by Tyler (1997). As both scales had reliability scores less 0.7 (Nunnally 1978), we developed a hybrid scale. Pre-testing revealed that the two-item measure we use in this research had the higher and acceptable reliability score of 0.77.

norms as the average score of two items, adapted from Bobek et al. (2013), using a 7-point Likert scale as above, as follows: 1) *It is morally wrong to engage in tax evasion behavior;* and 2) *My close friends believe it is wrong to engage in tax evasion behavior*. The Cronbach's alpha of this measure was 0.79, which is good (Nunnally, 1978). We also controlled for the possibility that a respondent may have been influenced by a previous unpleasant encounter with a tax authority employee by asking a binary question, *Have you ever had an unpleasant encounter with an IRS agent*? In sum, there are nine control variables.

4. RESULTS

4.1 Manipulation checks

We performed manipulation checks for procedural and distributive fairness independent variables, using a 7-point Likert scale (where 1=strongly disagree and 7=strongly agree). The manipulation check for distributive fairness was, *Jamie was satisfied with last year's tax result compared to other tax situations*. This manipulation check was supported ($F=82.1$, $p<0.01$), and in the expected direction.[9] The manipulation check for procedural fairness was, *Jamie was satisfied with the IRS process to resolve last year's tax dispute*. This manipulation check was supported ($F=109.1$, $p<0.01$), and in the expected direction.[10] These results indicate the manipulations were effective.

4.2 Hypothesis tests relating to fairness and compliance

We performed a simple analysis of variance (ANOVA) on the manipulated variables with the dependent variable, compliance intentions. We found that compliance intentions were influenced by both distributive fairness ($F=7.53$; $p<0.01$) and procedural fairness ($F=6.85$; $p<0.01$). Order was not significant ($F=0.712$; $p=0.40$). We did not find an interaction between distributive fairness and procedural fairness. A comparison of means shows that compliance intentions were higher when circumstances are fair, and lower when the circumstances are unfair, as expected. This trend was similar regardless of order of the fairness information. Table 2 presents the means and Figure 1 graphs the fairness effects (the means are averaged over both orders of presentation).

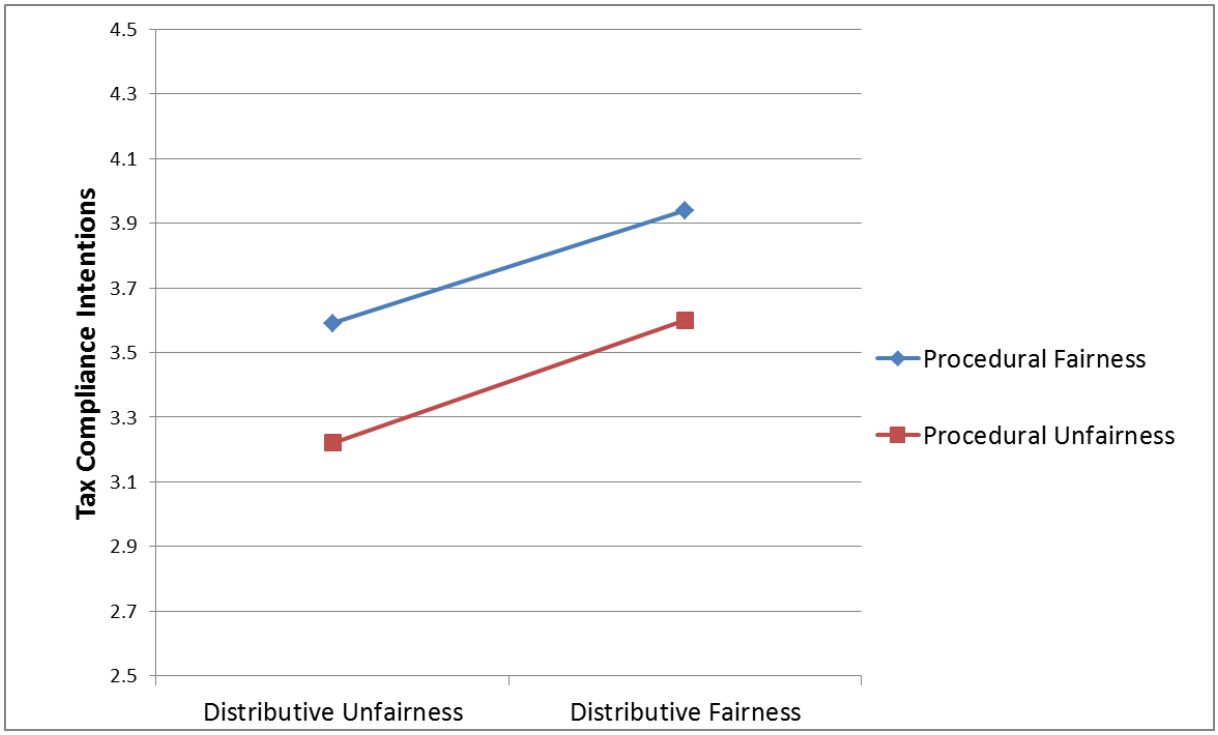
Table 2: Compliance Intentions: Cell Means and Standard Deviations

		DISTRIBUTIVE		Total
		Fair	**Unfair**	
PROCEDURAL	**Fair**	3.94 (1.43)	3.59 (1.50)	3.77 (1.47)
	Unfair	3.60 (1.37)	3.22 (1.08)	3.41 (1.24)
Total		3.77 (1.41)	3.41 (1.32)	3.59 (1.38)

[9] Participants in the lower distributive fairness condition responded with a mean score of 2.99/7, and participants in the higher distributive fairness condition responded with a mean score of 4.61/7.

[10] Participants in the lower procedural fairness condition responded with a mean score of 2.81/7, and participants in the higher procedural fairness condition responded with a mean score of 4.69/7.

Fig. 1: Influence of Procedural Fairness and Distributive Fairness on Compliance Intentions



We find that neither type of fairness dominated. Mean compliance intentions in the condition where distributive fairness exists and procedural fairness does not exist (3.60) is the same as in the condition where procedural fairness exists and distributive fairness does not exist (3.59) (t=0.04; p=0.97). We also find evidence that it may be important whether or not there are multiple types of fairness versus one type of fairness versus no fairness. The highest compliance intentions value of 3.94 occurs when the situation is both procedurally fair and distributively fair. We find that this level of compliance is (marginally) significantly higher than the level of compliance when one type of fairness exists (either procedurally fair/distributively unfair or vice versa) (t=1.97, p=0.051). Similarly, compliance is significantly higher when one type of fairness exists (either distributive or procedural) than when the situation is both distributively and procedurally unfair (t=2.47; $p < 0.05$).[11] Thus it would seem that increments in fairness/unfairness have significant consequences for compliance intentions.

Incorporating the nine control variables, we performed an analysis of covariance (ANCOVA). The dependent variable was compliance intentions. The fixed factors were

[11] To assess these effects, we used contrast coding over the four conditions that manipulated distributive and procedural fairness. Both orders of presentation of fairness information are included in each of these conditions because order was not significant in the analysis. The conditions are as follows: condition 1: situation is both procedurally and distributively unfair; condition 2: situation is distributively unfair and procedurally fair; condition 3: situation is distributively fair and procedurally unfair; condition 4: situation is distributively fair and procedurally fair. For the first test the contrast coding was 0, -1, -1, 2 and for the second test it was -2, 1, 1, 0.

our manipulated variables, distributive fairness, procedural fairness and order of presentation. Covariates were the control variables described above and our proposed mediating variable, legitimacy. Results are reported in Table 3.[12] We found significant main effects of procedural fairness and distributive fairness on compliance intentions ($p < 0.05$ in both cases), and no significant interaction effect between them ($p=0.99$). Order of presentation of procedural fairness versus distribution fairness did not significantly influence compliance intentions ($p=0.40$). We also found that legitimacy perceptions, social norms, previous unpleasant experiences with the tax authority, and number of years that tax returns had been filed all had significant effects on compliance intentions in our analysis ($p < 0.01$ in each case).

Table 3: Test of Between-Subject Effects

ANCOVA of Distributive Fairness, Procedural Fairness, and Order on Compliance Intentions				
	SS	Df	MS	*F*-value
Distributive Fairness	8.30	1	8.30	4.80 *
Procedural Fairness	8.58	1	8.58	4.97 *
Order	1.24	1	1.24	0.72
Distributive Fairness x Procedural Fairness	0.01	1	0.01	0.99
Distributive Fairness x Order	0.08	1	0.08	0.05
Procedural Fairness x Order	5.92	1	5.92	3.43
Distributive Fairness x Procedural Fairness x Order	0.10	1	0.10	0.06
Social Norms	14.13	1	14.13	8.18 *
Unpleasant Encounter with IRS	16.30	1	16.30	9.44 *
Years Filed	6.98	1	6.98	4.04 *
Legitimacy	10.60	1	10.60	6.13 *
Detection Likelihood	3.56	1	3.56	2.06
Age	0.08	1	0.08	0.05
Gender	0.30	1	0.30	0.17
Tax Preparer	1.48	1	1.48	0.86
Education	0.14	1	0.14	0.08
Income	0.02	1	0.02	0.01
* - indicates a significant result at the 0.05 level of significance (two-tailed) Adjusted R-squared = 0.087				

Our findings provide evidence that perceptions of distributive fairness and procedural fairness influence taxpayer compliance, thereby supporting H1 and H2. Because there was no interaction, we answer our research question (RQ1) by finding that perceptions

[12] We include legitimacy as a covariate for completeness but the results as presented do not change significantly when legitimacy is excluded from the ANCOVA.

of distributive fairness and procedural fairness act independently and do not interact to influence taxpayers' compliance intentions.

4.3 Hypotheses tests of the mediating effect of legitimacy

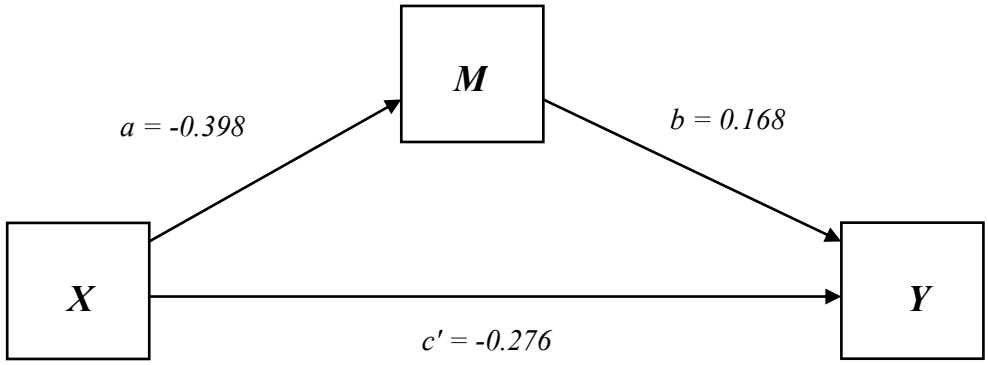
We also hypothesised that perceptions of legitimacy would mediate the relation between fairness and compliance (H3 and H4). We observed, in a simple ANOVA using legitimacy as dependent variable, that both procedural fairness and distributive fairness significantly influence perceptions of legitimacy ($F=16.42$; $p < 0.001$ and $F = 12.64$, $p < 0.001$, respectively).

We applied the Hayes (2018) mediation analysis approach to assess mediation. This involved testing a simple mediation model, in which a causal antecedent variable (distributive fairness or procedural fairness) influences an outcome (compliance intentions) through a single intervening variable (legitimacy).[13]

Distributive fairness: H3 considers the role of legitimacy in the association between distributive fairness and compliance. From a simple mediation analysis conducted using ordinary least squares path analysis, distributive fairness indirectly influenced compliance intentions through its effect on perceived legitimacy of the tax authority. As can be seen in Table 4a, taxpayers in the condition where distributive unfairness occurred assessed IRS legitimacy to be lower than did participants in the condition where distributive fairness occurred ($a = -0.398$). Taxpayers who perceived that the tax authority was legitimate expressed a stronger intention to be compliant ($b = 0.168$). A bias-corrected bootstrap confidence interval for the indirect effect ($ab = -0.067$) based on 10,000 bootstrap samples was entirely below zero (-0.146 to -0.013), which is evidence of an indirect effect of distributive fairness on compliance through legitimacy. There was also evidence that distributive fairness influenced compliance independently of its effect on legitimacy ($c' = -0.276$), such that taxpayers who perceived distributive unfairness were less likely to be compliant than taxpayers who perceived distributive fairness. Consequently, H3 is supported.

[13] Hayes (2018, pp. 113-117) explains why the traditional mediation analysis approach of Baron and Kenny (1986) should be abandoned.

Table 4a: Model Coefficients for Distributive Fairness and Legitimacy Mediation Analysis



Antecedent		Consequent						
		M (Legitimacy)				*Y* (Compliance)		
		Coeff.	*SE*	p-value		Coeff.	*SE*	p-value
X (Distributive Fairness)	*a*	-0.398	0.129	<.001	*c′*	-0.276	0.137	.045
M (Legitimacy)		--	--	--	*b*	0.168	0.054	.002
Constant		2.227	0.645	<.001		3.455	0.332	<.01
		R^2 = 0.243 F (10, 378) = 12.158, p<.001				R^2 = 0.106 F (11, 377) = 4.048, p<.001		

The indirect effect of X (Distributive Fairness) on Y (Tax Compliance Intentions) is negative (-0.067) and significant (a bootstrap confidence interval based on 10,000 bootstrap samples was entirely below zero (-0.146 and -0.013)), which suggests that Distributive Fairness is significantly associated with Tax Compliance Intentions when taxpayers perceive that the tax authority is legitimate.

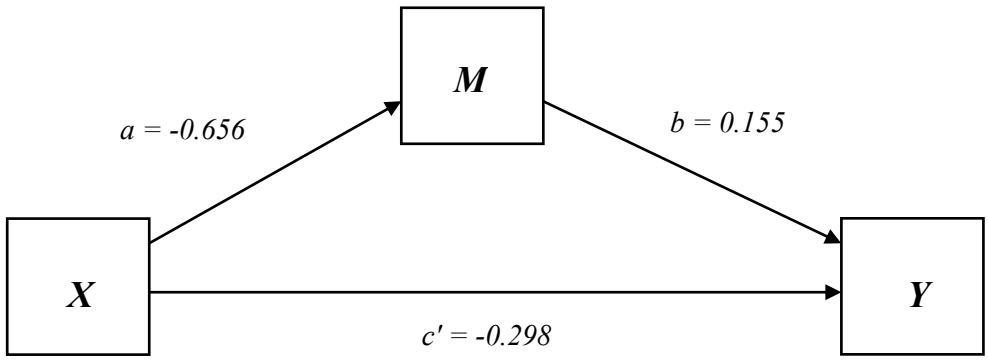
Note: the above analysis is conducted using the same nine covariates as shown in Table 3 (social norms, unpleasant encounter with IRS, years filed, detection likelihood, age, gender, tax preparer, education, and income). The influence of the covariates is not shown above to streamline the presentation of the results. The results above do not differ significantly when the covariates are excluded.

The results in Table 4a include the influence of all nine covariates reported in Table 3. Excluding the covariates does not significantly change the results as presented above.

Procedural Fairness: H4 considers the role of legitimacy on the association between procedural fairness and compliance. From a simple mediation analysis conducted using ordinary least squares path analysis, procedural fairness indirectly influenced compliance intentions through its effect on perceived legitimacy of the tax authority. As can be seen from Table 4b, taxpayers who perceived procedural unfairness assessed

legitimacy of the IRS to be lower than did participants who perceived that procedures were fair (*a* = -0.656), and taxpayers who perceived that the tax authority was legitimate expressed a stronger intention to be compliant (*b* = 0.155). A bias-corrected bootstrap confidence interval for the indirect effect (*ab* = -0.102) based on 10,000 bootstrap samples was entirely below zero (-0.206 to -0.024), which is evidence of an indirect effect of procedural fairness on compliance through legitimacy. There was also evidence that procedural fairness influenced compliance independently of its effect on legitimacy (*c*' = -0.298), such that taxpayers who perceived procedural unfairness were less likely to be compliant than taxpayers who perceived that IRS procedures were fair. Consequently, H4 is also supported.

Table 4b: Model Coefficients for Procedural Fairness and Legitimacy Mediation Analysis



Antecedent	Consequent							
	M (Legitimacy)				*Y* (Compliance)			
		Coeff.	*SE*	p-value		Coeff.	*SE*	p-value
X (Procedural Fairness)	*a*	-0.656	0.126	<.001	*c′*	-0.298	0.139	.033
M (Legitimacy)		--	--	--	*b*	0.155	0.055	.005
Constant		2.500	0.620	<.001		2.380	0.677	<.001
	R^2 = 0.277 F (10, 378) = 14.445, p<.001				R^2 = 0.107 F (11, 377) = 4.099, p<.001			

The indirect effect of X (Procedural Fairness) on Y (Tax Compliance Intentions) is negative (-0.102) and significant (a bootstrap confidence interval based on 10,000 bootstrap samples was entirely below zero (-0.206 and -0.024)), which suggests that Procedural Fairness is significantly associated with Tax Compliance Intentions when taxpayers perceive that the tax authority is legitimate.

Note: the above analysis is conducted using the same nine covariates as shown in Table 3 (social norms, unpleasant encounter with IRS, years filed, detection likelihood, age, gender, tax preparer, education, and income). The influence of the covariates is not shown above to streamline the presentation of the results. The results above do not differ significantly when the covariates are excluded.

The results in Table 4b include the influence of all nine covariates reported in Table 3. Excluding the covariates does not significantly change the results as presented above.

4.4 Robustness checks

We also conducted Kruskal-Wallis tests to determine if our main effects of each dimension of fairness are robust to an ordinal rather than interval interpretation of our data. A Kruskal-Wallis H test showed that there was a statistically significant difference in tax compliance intentions between levels of distributive fairness, $\chi^2(1) = 6.154$, $p = 0.013$, with a mean rank compliance score of 209.06 for high distributive fairness and 180.87 for low distributive fairness. A Kruskal-Wallis H test also showed that there was a statistically significant difference in tax compliance intentions between levels of procedural fairness, $\chi^2(1) = 6.411$, $p = 0.011$, with a mean rank compliance score of 208.99 for high procedural fairness and 180.20 for low procedural fairness. These results are consistent with our main ANCOVA in Table 3.

To provide additional evidence of the robustness of our findings of independent effects of each of distributive fairness and procedural fairness, we performed Wilcoxon Mann-Whitney tests in which we compared the effects of each level of distributive fairness (high and low) on the dependent variable (tax compliance intentions) at each level of procedural fairness (high and low). We did not find any significant differences at the 0.05 level of significance (two-tailed). We also performed Wilcoxon Mann-Whitney tests in which we compared the effects of each level of procedural fairness (high and low) on the dependent variable (tax compliance intentions) at each level of distributive fairness (high and low). We again did not find any significant differences at the 0.05 level of significance (two-tailed). These findings provide some assurance that tax compliance intentions for one dimension of fairness do not differ according to levels of the other dimension of fairness. These findings are consistent with our main ANCOVA in Table 3, as we did not find a significant interaction effect.

Finally, our ANCOVA is also supported by conventional regression analysis (not tabulated) that show that both main effects hold with and without the nine covariates.

5. DISCUSSION AND CONCLUSION

A high degree of compliance with tax law is essential for governments to provide services to citizens and to govern them. Tyler's (2006 [1990]) theory on compliance proposes that citizens' perceptions of fairness influence their willingness to obey the law and that this influence is mediated by their perceptions of the legitimacy of the legal authority. While Tyler's theory has been empirically tested in the tax and other contexts with respect to procedural fairness, it has not been tested with respect to distributive fairness. Previously, this theory has also not been tested by means of a controlled experiment, making causation difficult to establish. Also, the influence of distributive and procedural fairness on tax compliance has not previously been considered in the same experiment even though both can occur in a tax context. In the current research, we address these gaps in the literature. We believe our findings may be useful for tax authorities as well as tax and fairness researchers.

Our experiment on American taxpayers manipulates perceptions of distributive fairness and procedural fairness. We find that the two types of fairness significantly influence compliance intentions and that the order of receiving this information has no effect. We find that procedural and distributive fairness have an equal and additive effect on

compliance, with a procedurally and distributively unfair situation resulting in the lowest compliance, a procedurally or distributively fair situation resulting significantly higher compliance, and a procedurally and distributively fair situation resulting the highest compliance intentions.[14] This finding suggests that degrees of fairness are perceived by taxpayers and impact their willingness to comply with tax authorities. It may be that when an individual is faced with information about more than one instance of fairness/unfairness, consolidation of this information may involve a heuristic based on number of fairnesses/unfairnesses[15] and this is something that could be explored in future research.

Further, we found evidence that both distributive and procedural fairness influence compliance through their impacts on perception of the legitimacy of the tax authority. To the best of our knowledge, this is the first study to demonstrate the impact of distributive fairness on compliance through the mediating effect of legitimacy perceptions. While previous correlational studies have identified that perceived legitimacy of a legal authority mediates the relationship between procedural fairness and compliance with the law (e.g., Tyler 2003; 2006 [1990]; Tyler & Lind, 1992; Tyler & Degoey, 1995), our research extends these findings and contributes to the tax literature on legitimacy by providing evidence that legitimacy mediates the influence of both procedural fairness and distributive fairness on compliance. Thus, we contribute the first distributive fairness related empirical support for Tyler's (2006 [1990]) theory of compliance.

Our findings have several implications for tax authorities. Our findings suggest and reinforce that tax authorities should ensure that their procedures are perceived as fair, and that taxpayers' outcomes are consistent across taxpayers. Doing both may result in greater compliance than demonstrating only one of these forms of fairness. If a tax authority creates situations that are procedurally fair but distributively unfair, or vice versa, compliance may suffer as compared to situations that are both procedurally and distributively fair. Tax authorities should also note the importance of taxpayer perceptions of their legitimacy in terms of compliance. Compliance may be enhanced when efforts are made to improve these perceptions.

Our results show that perceptions of legitimacy are improved if distributive fairness and procedural fairness are improved. The clearest implication is that tax authorities should be procedurally and distributively fair. But it is also important for taxpayers to know that fairness has occurred, so tax authorities could perhaps consider initiating explicit communication efforts to reinforce that tax outcomes are fair across taxpayers and the fairness of processes are important to the IRS. Consideration could also be given to providing communications that may improve taxpayer confidence in the legitimacy of the tax authority directly and to combat social media misinformation that may undermine the legitimacy of the tax authority.

In our analysis, some of our control variables were significantly associated with tax compliance (social norms and years filed were positively associated and previous unpleasant encounters with IRS were negatively associated). Further research in these

[14] The order in which distributive information was presented relative to procedural information did not significantly impact compliance intentions.
[15] We thank one of our reviewers for this idea.

areas may also provide additional useful information to help tax authorities understand factors that influence compliance.

As with all research, our study has several limitations. The primary limitation in our study is that our manipulation of distributive fairness was intentionally generic. This design choice was done to make our findings broadly generalisable but in so doing may undermine our ability to provide insight into the applicability of our findings for a specific operationalisation of distributive fairness. We encourage future research into the strength and effect of specific operationalisations of distributive fairness dimensions that may be found and applied in real world settings. Another limitation is that our participants were American taxpayers. While we believe the results of our studies should be of interest to an international audience, the findings of the study may not be generalisable beyond US taxpayers. We encourage further research using taxpayers from other countries to address the issue of generalisability. Third, a limitation of experimental research is that generalisability is predicated upon the specific manipulations used in an experiment. Finally, due to the sensitive nature of tax compliance, it is possible that respondents' responses were biased. We attempted to mitigate this concern by assuring respondents of anonymity and by asking what they thought a hypothetical taxpayer would do, rather than what they themselves would do. Prior research indicates that respondents project their same feelings and attitudes when asked indirect questions instead of direct questions (Fisher, 1993), and that vignettes can minimise the effects of social desirability bias (Hughes & Huby, 2004).

As noted above, future research can consider how different operationalisations of distributive fairness and procedural fairness influence compliance behaviour. For instance, Leventhal (1980) identified several procedural fairness criteria which, in the tax context, may have unique influences on taxpayer behaviour (Farrar et al., 2013; Worsham, 1996). It would be useful for tax policy-makers to know which specific procedural and distributive criteria are most influential for taxpayers in encouraging compliance, especially as tax authorities are increasingly turning to taxpayer charters and tax ombudsman offices to handle taxpayer disputes over procedural and distributive matters. The psychological processes underlying voluntary tax compliance are complex and insufficiently understood. There is much to learn about this important issue.

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APPENDIX

EXPERIMENTAL INSTRUMENT

Introduction

Below is a brief scenario about a taxpayer named Jamie and his experiences with the Internal Revenue Service (IRS). Please read it carefully, as you will be asked some follow-up questions. We would like to know what you would do if you were Jamie.

Common information

Jamie is a small business owner. Last year, he had a lengthy and frustrating dispute with the IRS concerning a tax deduction. In the end Jamie was disappointed to find out that he was not allowed to claim the full deduction.

Wordings for fairness manipulations

[Distributively fair then Procedurally fair]

Even so, Jamie believed that his tax result was fair compared to other situations he had recently heard of. Also, he believed that the IRS process to resolve the dispute was fair.

[Procedurally fair then Distributively fair]

Even so, Jamie believed that the IRS process to resolve the dispute was fair. Also, he believed that his tax result was fair compared to other situations he had recently heard of.

[Distributively unfair then Procedurally fair]

Jamie believed that his tax result was unfair compared to other situations he had recently heard of. At the same time, he believed that the IRS process to resolve the dispute was fair.

[Procedurally fair then Distributively unfair]

Jamie believed that the IRS process to resolve the dispute was fair. At the same time, he believed his tax result was unfair compared to other situations he had recently heard of.

[Distributively fair then Procedurally unfair]

Even so, Jamie believed that his tax result was fair compared to other situations he had recently heard of. At the same time, he believed that the IRS process to resolve the dispute was unfair.

[Procedurally unfair then Distributively fair]

Even so, Jamie believed that the IRS process to resolve the dispute was unfair. At the same time, he believed his tax result was fair compared to other situations he had recently heard of.

[Distributively unfair then Procedurally unfair]

Jamie believed that his tax result was unfair compared to other situations he had recently heard of. Also, he believed that the IRS process to resolve the dispute was unfair.

[Procedurally unfair then Distributively unfair]

Jamie believed that the IRS process to resolve the dispute was unfair. Also, he believed that his tax result was unfair compared to other situations he had recently heard of.

Tax Compliance Intentions

This year Jamie's income included some cash earnings. Jamie knows that it is more difficult for the IRS to find out about cash income.

Please read the following statements and indicate your level of agreement by clicking on the appropriate response (7-point Likert scale, 1 = strongly disagree; 7 = strongly agree).

1) Under the circumstances, Jamie might not report all of his cash earnings on his tax return.

2) Jamie will not declare all the cash to the IRS.

3) Jamie is unlikely to report all his cash earnings to the IRS.

4) Jamie would be tempted to not report all of his cash receipts on his tax return.

Detection

1) If Jamie did not report all his cash income, the IRS would find out.

Legitimacy of the IRS

1) Jamie's circumstances would lead him to believe that the IRS does its job well.

2) Jamie's circumstances would lead him to feel that it is important to follow the IRS's rules.

7. MANIPULATION CHECKS

Please indicate your level of agreement with the following statements (7-point Likert scale, 1 = strongly disagree; 7 = strongly agree).

DISTRIBUTIVE FAIRNESS

1. Jamie was satisfied with last year's tax result compared to other tax situations.

PROCEDURAL FAIRNESS

1. Jamie was satisfied with the IRS process to resolve last year's tax dispute.

Comprehension checks.

1. Was Jamie's tax result last year fair or unfair compared to other tax situations he knew of? [fair / unfair]
2. Was the IRS process to resolve last year's dispute fair or unfair? [fair / unfair]

Demographic questions

1) Your gender: Male Female

2) Have you ever had an unpleasant encounter with an IRS agent? Yes No

3) Your present age: _____ years

4) For approximately how many years have you filed an income tax return?
_____

5) Who usually prepares your tax return? I do my spouse paid preparer other

6) Please indicate your highest level of education completed:

High School
Junior College Diploma
College degree
Graduate degree
Other

7) Please indicate your approximate annual income:

less than $25,000
between $25,000 and $50,000
between $50,001 and $75,000
between $75,001 and $100,000
≥ $100,000
Prefer not to answer

8a) It is morally wrong to engage in tax evasion behavior. (7-point Likert scale, 1 = strongly disagree; 7 = strongly agree).

8b) My close friends believe it is wrong to engage in tax evasion behavior. (7-point Likert scale, 1 = strongly disagree; 7 = strongly agree).

9. Was the scenario about Jamie's tax situation easy to understand? (Please comment if you want to)

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Identity theft tax refund fraud in the United States

Andrew Hultgren,[*] John Hasseldine[**] and Jonathan Nash[***]

Abstract

This article documents the phenomenon of identity theft tax refund fraud in the United States and describes the problem; including what it is, how the fraud is executed, its detection, magnitude and prevalence, and the response of key stakeholders. With a paucity of prior scholarly research and scant information from other countries, we rely on historical reports from the Internal Revenue Service (IRS) and its oversight agencies including the Government Accountability Office, Treasury Inspector General for Tax Administration, and the National Taxpayer Advocate. While metrics reflecting individual identity theft tax refund fraud have recently been trending in the right direction, the issue will have lasting consequences in terms of IRS resourcing and cybersecurity, taxpayer trust, tax preparation methods available to taxpayers and their compliance burdens – particularly the burden affecting low-income taxpayers, and on future tax compliance itself. Finally, this article is a call for scholarly attention both in the US and elsewhere, where the issue of this fraud has been under-researched.

Key words: cybersecurity; identity theft; IRS; tax administration; tax compliance; tax fraud

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1. INTRODUCTION

Identity theft (IDT) tax refund fraud in the United States has been a problem for the Internal Revenue Service (IRS) over the last 30 years, as well as at a state level. The first recorded instance of this type of fraud in the US occurred in 1988 as the *Los Angeles Times* reported that Donald Penrod had been indicted with the first ever charge of fraudulently filing tax forms electronically to receive an illegitimate refund (Nigrini & Peters, 2018, p. 39). By 1992 the Government Accountability Office (GAO; at that time, the General Accounting Office) identified the filing of fraudulent returns electronically as a major issue to be monitored and throughout the 2000s the problem continued to increase (GAO, 1992).

Although this article only focuses on the US, the problem clearly affects many countries. An Organisation for Economic Co-operation and Development (OECD) (2006) report on a survey to 19 members (i.e., countries) of a sub-group on Tax Crimes and Money Laundering examined the risks associated with IDT, how countries detected suspected cases, 'red flag indicators' of fraud, and the measures undertaken and results of these activities. Brief country case studies are reported on detection strategies and techniques, the use of multi-agency cooperation, and generic examples are provided of measures used such as data mining, data matching, risk profiling, inter-agency cooperation, training and public education.

This type of fraud allows fraudsters to maintain a degree of anonymity, complicating the successful prosecution of perpetrators. The growth of IDT tax refund fraud occurred as in the Information (Digital) Age, personal identifiable information (PII) was easier to obtain and the massive growth in federal and state tax return e-filing allowed this fraud to be perpetrated on a large scale. Federal tax e-filing has drastically increased throughout the 21st century. Only 58% of returns were filed electronically in 2008, but this escalated to 81% in 2012 and to over 90% by 2016 (Brody, Haynes & Mejia, 2014; Brink & Hansen, 2020).

The IRS first publicly recognised the problem when they issued their 'Dirty Dozen' list of tax scams in 2011, when they grouped tax refund fraud in with phishing,[1] but IRS then escalated their evaluation of the problem subsequently in 2012 – when identity theft topped the list (Meyerowitz, 2011; US Department of the Treasury, 2012). At this time, IDT tax refund fraud had already increased, so arguably the IRS was somewhat late in their assessment of the issue at hand, although the IRS had taken some actions to prevent it before the 'Dirty Dozen' list was released.[2]

The remainder of this article is structured as follows. The next section describes how IDT tax refund fraud is executed. Section 3 documents the development of this fraud and how the IRS has addressed the issue over three primary time periods. Section 4 outlines the responses by key oversight stakeholders to IRS actions based on reports published by GAO, the National Taxpayer Advocate (NTA), and the Treasury Inspector

[1] Phishing occurs when a fraudster contacts a potential victim through a medium such as email or telephone and poses as a legitimate enterprise such as the IRS. The email/caller will then direct the victim to a website that appears legitimate and then the victim enters in their personal information for some stated purpose, such as it being required for their refund to be processed or to avoid a fee (Chambers & Zeidan, 2013).

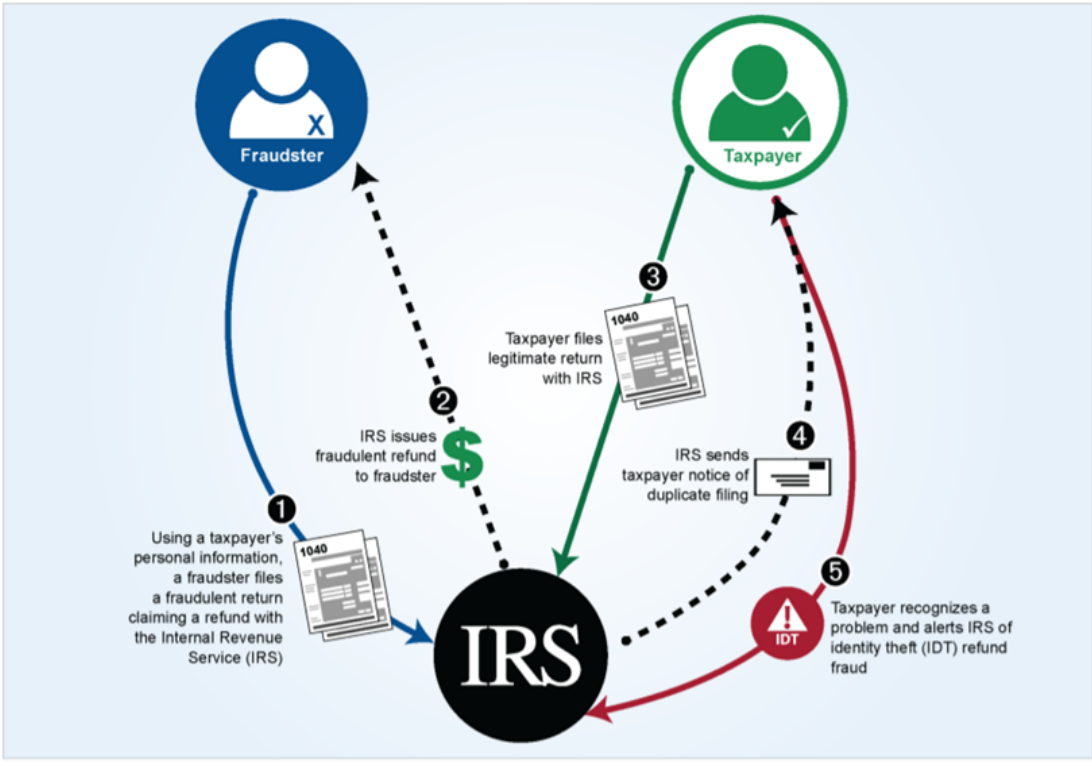
[2] The 'Dirty Dozen' is an annual compilation published by the IRS of common scams that taxpayers may encounter throughout the year, although many of these schemes tend to peak during tax return filing season. See https://www.irs.gov/newsroom/dirty-dozen.

General for Tax Administration (TIGTA) and various outcomes including the *Taxpayer First Act 2019*. Section 5 then discusses several ancillary practical and scholarly implications at both individual and systemic levels before section 6 offers concluding remarks.

2. EXECUTION OF IDT TAX FRAUD

There are multiple methods to use IDT to commit tax evasion (OECD, 2006) but this section details the actual execution of tax refund fraud in the US. It is relatively straightforward and comprises three main steps starting with a fraudster obtaining a victim's PII, such as their name and social security number at a bare minimum, and then using this information to file a fraudulent tax return that provides them with a tax refund which is mailed to an address, or more often directly deposited to a bank account or prepaid debit card. When the legitimate taxpayer consequently files their return, it will be denied and the victim is forced into undertaking a lengthy remedial process (Thorne & Stryker, 2015). The process is shown graphically in Figure 1 (GAO, 2016, p. 8).

Fig. 1: Sample process for IDT tax refund fraud, United States



Source: GAO analysis. | GAO-16-508

Note: This figure's numbering shows the order in which events occur when fraudsters successfully commit IDT refund fraud.

Source: GAO (2016, p. 8).

For the fraudster, obtaining the victim's PII is the initial barrier to perpetrating IDT tax refund fraud. Unfortunately, this is relatively easy in the modern era as fraudsters use a variety of tactics to obtain such information, one rampant method being through phishing through unsolicited emails and telephone calls. One sub-category of phishing schemes saw fraudsters posing as a senior company executive ostensibly emailing their own payroll or human resources department, requesting employees' PII and their wage and tax statement information from the employees' Form W-2 statements (GAO, 2018).

A further method has seen dishonest employees stealing PII from in-house databases through their employment and then either using the information to file fraudulent returns themselves or on-selling the PII to fraudsters. Other recorded instances include employees in prisons, educational institutions, medical facilities, and even within the IRS itself illegally downloading vast amounts of PII from databases for the purpose of committing IDT tax refund fraud (Nigrini & Peters, 2018).

Even the PII of deceased individuals can be used to commit this fraud. Historically, such information was easily available as it was published in newspaper obituaries. This then evolved in the modern era with firms providing individuals with hereditary data, such as Ancestry.com and Genealogy.com, even reporting the social security numbers of deceased individuals, although this practice stopped following pressure from the IRS (Fisk & Stigile, 2012).

Another major technique employed by fraudsters is the 'old-fashioned' technique of obtaining/stealing physical documents/equipment with PII on it. Fraudsters may 'dumpster dive' and sift through the trash of individuals looking for discarded tax returns, bank records, credit card receipts or other records containing PII or even search discarded laptop computers that contain information which can be used to perpetrate fraud (Chambers & Zeidan, 2013). They may obtain such data through home robbery where they steal documents with PII, or via pickpocketing a person's wallet, purse, or smartphone. Fraudsters may even steal a victim's mail either straight from their mailbox or more diabolically by submitting a change of address form to divert mail to an ulterior location (Fisk & Stigile, 2012).

Lastly, a method that is becoming more and more pressing is the purchase of PII from mass data breaches and hacking attempts (Nigrini & Peters, 2018). This enables organised groups to commit IDT fraud on a large scale and the quantity of information exposed by data breach is also increasing at an alarming rate.[3] Large scale data breaches are common, with the Equifax data breach in 2017 compromising varying amounts of PII for 143 million American consumers, or 44% of the US population, further arming fraudsters for all types of IDT fraud (Marcus, 2018).

The second step of creating the fraudulent return is a relatively straightforward process. Unfortunately, the IRS does not release detailed information on what schedules are used or what kinds of numbers fraudsters use for the withholdings and credits as this would essentially create a series of step-by-step instructions on how to commit the fraud. It is relatively simple to compile a return where the taxes due are less than the payments and credits, therefore generating a refund for the fraudster (Nigrini & Peters, 2018). Nowadays the more complex aspect of the fraud is creating a fraudulent return that is convincing enough to bypass the IRS's filters (discussed further in section 3). The filters

[3] Current data is publicly available from the Identity Theft Resource Center at www.idtheftcenter.org.

have gradually become more advanced throughout the years, thus necessitating fraudsters to continually evolve and hone their craft, creating gradually more convincing returns every year (IRS, 2018). NTA (2017a) noted an example of a more sophisticated scheme where criminals use employer identification numbers to file fraudulent business tax returns and concluded that the IRS must continue to remain vigilant and be nimble to counteract emerging developments in IDT fraud.

The third step in the fraud is to obtain the tax refund from the IRS. Most fraudsters use prepaid debit cards or direct deposits, with a slight tendency towards prepaid debit cards as these can be anonymously deposited without any direct tie to the fraudster (Chambers & Zeidan, 2013). Early on, a flaw allowed multiple tax returns to be filed from the same address, and according to TIGTA (2012) over 2,000 returns were filed from an address in Lansing, Michigan as well as hundreds of returns being filed from other specific addresses. Thankfully, this issue, as well as the issue of multiple refunds being deposited to one anonymous bank account, were alleviated following IRS action. Tax refunds must now be made to a bank account or debit card in the taxpayer's name and the number of refunds permitted to be sent to a single source is limited to three, but this has obviously been insufficient to completely prevent this final step of the fraud.

3. IRS ACTION ON IDT TAX FRAUD OVER TIME

3.1 Years prior to 2010

Despite some scrutiny from IRS oversight bodies (Hasseldine, 2015), the IRS was slow to publicly treat IDT tax refund fraud as a major issue and did not include it in their 'Dirty Dozen' list of scams until 2012. Notwithstanding this, over the years, the IRS has developed their techniques, administrative bodies, and procedural systems for dealing with the fraud.

In 2005, the IRS officially established the Identity Theft Program Office, later creating the Privacy, Information Protection, and Data Security office and the Identity Theft and Incident Management office with an accompanying Advisory Committee in 2007 (NTA, 2007). In 2008, the IRS began marking taxpayers' accounts within their database if taxpayers had been victims of this fraud, therefore helping to coordinate their efforts to assist taxpayers across various divisions. They also established the Identity Protection Specialized Unit to help taxpayers who had been victims as well as a toll-free hotline for victims to receive advice on the process that they would need to complete (NTA, 2008).

Beginning in 2009 the IRS implemented a series of filters or 'business rules' that could automatically assess if a return seemed fraudulent and flag it for screening by an actual IRS employee. The IRS also created an Identity Theft Affidavit in April 2009 (Form 14039), still currently used, so that taxpayers who knew they were victims of IDT tax refund fraud could notify the IRS of the issue, thereby streamlining the process somewhat for identity confirmation. Then also in 2009, the IRS initiated their educational campaign against falling victim to identity theft. By educating taxpayers and tax practitioners on methods to prevent becoming a victim of identity theft, the goal was to reduce fraud, and the IRS participated in over 40 events throughout the year, six of those being Nationwide Tax Forums (NTA, 2009).

3.2 Years 2010 – 2014

The IRS increased their efforts against IDT tax refund fraud in the years through 2014. In 2010 they implemented the Electronic Fraud Detection System, still in place to some extent to this day. The system was a more developed form of the filters that were used previously, as it would analyse returns both based on a series of general filters and based on prior year returns. It 'scores' tax returns and determines a probability of them being fraudulent, with those scoring above a certain (undisclosed) percentage being subject to further screening and extremely high scores being treated as fraudulent automatically (TIGTA, 2010).

In 2011, IRS created the Enhanced Return Processing program which sought to coordinate efforts throughout the various IRS divisions as NTA (2011) noted that 28 different subunits were involved in activities regarding identity theft. Part of this program was an initiative that sought to quell the number of fraudulent returns being filed with deceased individuals' information. This was accomplished in part by joint work with the Social Security Administration to begin marking the IRS accounts of deceased individuals and by putting pressure on websites such as Ancestry.com to cease listing the PII of decedents (Fisk & Stigile, 2012).

As 2012 was the first year that the IRS listed IDT tax refund fraud on its 'Dirty Dozen' tax scams, it is unsurprising that this year saw several advances made in the fight against fraudsters. For example, IRS assigned resources of 3,000 employees dedicated to the issue, with over USD 300 million spent (Nigrini & Peters, 2018). One of the most substantial programs introduced in 2012 was the Identity Protection Personal Identification Number program (NTA, 2012). This involves assigning taxpayers a specific number that they must use in order to file their return electronically (the medium that the fraud takes place in for the most part). The only taxpayers who were outright assigned a number were prior fraud victims, but additionally it was offered to taxpayers in Florida, Georgia, and the District of Columbia to opt into, as these were the areas that the IRS assessed as having higher fraud rates per capita (Hammel & Murolo, 2016).

A total of 251,500 numbers were issued in 2012 and 12,936 taxpayers then filed using an incorrect number, but this was later established to largely be due to human error and not a problem with the system (GAO, 2012). NTA (2012) did note that the numbers were all issued in one batch annually instead of issuing a number with every individual case that was brought to the IRS throughout the year.

Moreover, the IRS continued in its efforts to educate taxpayers through a digital approach, publishing up-to-date information on IDT tax refund fraud on their website and creating a series of YouTube videos and podcasts (Fisk & Stigile, 2012). They also decentralised their efforts by creating 21 specialised subunits to address the issue, but this approach was only partly successful (NTA, 2012).

Additionally in 2012, the Taxpayer Protection Program was created to analyse the returns identified by filters, which would also work with legitimate taxpayers who were falsely screened (TIGTA, 2018). Finally, the IRS created the Refund Fraud and Identity Theft Global Report which sought to consolidate and condense information about IDT tax refund fraud from various IRS divisions, and other governmental bodies, into one standalone report. This would then be used to further coordinate the IRS's efforts and serve as a management tool. This Global Report was significant as subunits were

previously compartmentalised, and the report was seen as an opportunity to create a more consistent strategic view (GAO, 2012).

Progress in 2013-2014 was slower. The IRS mandated that bank accounts be in the taxpayer's name to interfere with the second step of the fraudsters in acquiring the refund (TIGTA, 2012) and an online portal was created in 2014 for taxpayers to retrieve their PIN numbers, as previously taxpayers could only receive their PIN numbers and replacement numbers via mail (NTA, 2013). Congress also passed the *Stop Identity Theft Act* of 2014 which increased penalties for fraudsters and mandated the Department of Justice to collaborate with the IRS on future efforts, and to provide an annual report to Congress with updates (Thorne & Stryker, 2015). An Identity Theft Taxonomy was created to actually track and determine the amount of IDT tax refund fraud that was attempted, and the amount of refunds actually issued to false filers, as previously the IRS was relying mostly on estimates (GAO, 2014).

3.3 Years 2015 – 2020

During 2015, the IRS committed over 4,000 full-time employees and spent USD 470 million, but it was noted that even more funding would have proven useful (GAO, 2016). A revamp of the Electronic Fraud Detection System began with the testing of a new Return Review Process which had been in development since 2009 (GAO, 2015). The major benefit of this process was that in addition to the previous filters that relied on binary analysis, the new filters consisted of both rules and models. Additionally, the system was more flexible and its efficacy was seen in the first year as its false detection rate (the percent of legitimate returns flagged as fraudulent) was only 37.9% in comparison to a prior rate of 54.5% (NTA, 2016).

In 2015 the IRS also consolidated their IDT victim assistance functions into their Wage and Investment division, doing away with the 21 specialised units established in 2012 (NTA, 2014). A major benefit allowed victims to channel all their communications with the IRS through a single point of contact, rather than having to deal with numerous employees across different departments. There were still some cases requiring special attention, but most standard cases were now streamlined – previously advocated for many prior years (NTA, 2016). It was also reported in 2015 that the IRS increased the number of taxpayer accounts that had been marked as deceased to 28.4 million (TIGTA, 2015).

The most profound development from 2015 was the creation of the 'Security Summit', a meeting between 'IRS officials, the chief executive officers (CEOs) of the leading tax preparation firms, software developers, payroll and tax financial product processors, and state tax administrators' to discuss ways they could collectively address IDT tax refund fraud (IRS, 2015). The outcome of the Summit was a public-private partnership and the establishment of three work groups, based around authentication methods, information sharing techniques, and a Strategic Threat Assessment and Response working group designed to anticipate future issues. From the work groups came various ideas and initiatives such as improving the data elements in the filters and furthering external identity proofing procedures. They also worked on developing links with financial institutions, software companies, prepaid card companies and other third parties to share information with the IRS about developing trends in identity theft (IRS, 2015). Finally, the Summit discussed creating the framework for an Information Sharing and Analysis Center and a Cybersecurity Framework (first proposed in 2014) to further contest fraud (IRS, 2015).

In 2016 the Security Summit established additional work groups. Several programs were aimed at educating taxpayers and tax preparers, gaining nationwide media coverage (IRS, 2018). Separately, a collaboration with tax software providers helped to create more uniform secure standards for password creation and security questions. Finally, the Authentication Work Group introduced a pilot program to add a 16-digit verification code to 2 million Form W-2s (Wage and Tax Statements) in order to confirm that the submitted Form W-2s were legitimate accurate forms (Murolo, 2016). This helped to prevent fraudsters from concocting fictitious W-2s as it created an additional verification step, thus forcing fraudsters to steal accurate W-2s to acquire the code, therein making the fraud more complicated.

In 2017 another advance related to Form W-2 occurred with the acceleration of the W-2 submission deadline for employers to 31 January, previously 28 February in paper form (and 2 April electronically). Although this shift had been suggested as early as 2011 and had been reiterated for several years, it required Congressional approval in 2016 for its implementation (GAO, 2011; 2016). A late deadline in the tax filing season was problematic as it meant that the IRS could not match W-2 information to tax returns in real time, shown by the fact that the IRS had already issued nearly 60% of all tax refunds before they received a single W-2. This problem was further exacerbated by the fact that fraudsters would typically file very early on during the tax season in an attempt to file before the legitimate taxpayer. Moving the deadline forward proved to be effective as there was a 30% increase in received W-2 forms by March of 2017 (NTA, 2017b).

Other measures implemented in 2017 included the creation of the Identity Theft Tax Refund Fraud Information Sharing and Analysis Center (ISAC) to allow the IRS, states, and industry partners to efficiently share information about developments in IDT tax refund fraud through an online platform and the creation of a collaborative organisation (GAO, 2017). When it was created, a total of 31 states, 14 tax preparation firms, and three financial institutions partnered with the IRS and the online platform was launched in January 2017. Since its inception, the partnership has grown drastically with 73 organisations currently participating and every state has joined to some extent (ISAC, 2018; 2020). Through their online portal, various entities can submit lead reports ('leads') of cyberthreats for the IRS to analyse. In just the first year of its inception, the IRS received over 1.8 million leads, but there was some trepidation from industry representatives who were unsure about the usefulness of their leads due to a lack of communication back from the IRS. The necessary feedback on the leads is however hampered by a lack of resources at the IRS and by rules which limit their ability to share taxpayer or record-level data (GAO, 2017).

In March 2017 a Rapid Response Team was deployed within the IRS to respond to events that created a significant threat of IDT refund fraud within 24-72 hours. The team would assess the situation and attempt to provide as much damage control as possible, and then around 2-3 days after the event, they would provide action steps for future prevention and methods for alleviation of the threat. The first threat responded to was the hacking of the IRS's Data Retrieval Tool, which is a part of FAFSA.gov – a website for individuals to enter financial information to acquire need-based financial aid from the government. It was estimated that around 100,000 individuals had their PII stolen, but with the team's actions, the IRS was able to prevent the issuance of over 8,000 fraudulent refunds and implement new security measures associated with the Data Retrieval Tool (GAO, 2017).

4. RESPONSE FROM OVERSIGHT AGENCIES AND OTHER OUTCOMES

4.1 IRS oversight agencies

As noted in section 3.2, GAO (2012) published an audit on electronic filing fraud when the US tax system was first starting to experience major problems and the amount of refund fraud was in the millions rather than billions (Nigrini & Peters, 2018). Additionally, NTA (2005) featured this method of fraud as one of their 'most serious problems' and noted that there was an additional TIGTA report on identity theft that asserted the IRS had no concrete corporate strategy in place to address the growing concern of the fraud.

The NTA and TIGTA both addressed the problem again in 2007 and found that there had been a 396% increase in the total number of complaints directed to the Federal Trade Commission, which was the only available indicator of the problem, given that the IRS had not yet begun closely monitoring IDT fraud at the time (NTA, 2007; TIGTA, 2007). The problem then worsened with GAO (2011) noting that the total number of incidents of tax-related IDT nearly quintupled from 2008-2010 growing from 51,702 to 248,357 cases. Overall, since 2005 the problem worsened, given it was consistently listed as one of the NTA's 'most serious problems' (although not in 2006, 2010, or 2014), leading to increased IRS action.

Early on, the NTA critiqued the IRS as taking an overall reactive stance to IDT tax refund fraud, with the NTA advocating for a more proactive approach (NTA, 2007). Generally, the IRS has sought to prevent individuals/organised groups from being able to commit refund fraud, rather than prosecuting specific fraudsters as they assessed this as being a more effective approach (Nigrini & Peters, 2018). Nevertheless, the Criminal Investigation branch did manage to convict approximately 2,000 identity thieves over the years 2013-2015 (IRS, 2016).

In addition, the GAO noted issues with the IRS's fraud estimates as their systems for quantifying the amount of fraud did not account for returns that passed underneath a certain (undisclosed) threshold, and there was also evidence of 'double counting' fraud cases under different systems, leading to the GAO (2016) recommendation of using return-level data to estimate the amount of fraud to provide Congress and other decision-makers with more accurate information.

One important consequence of IRS actions is the assertion that it has placed an undue, over-reaching compliance burden on everyday taxpayers through their efforts to combat fraud. GAO (2018, p. 6) shows just how difficult the challenge is for the IRS:

> Designing authentication programs involves a balancing act—IRS needs to prevent fraudsters from passing authentication using stolen taxpayer information, but it must balance that against the burden on legitimate taxpayers who must also authenticate. If IRS makes the authentication process too stringent, legitimate taxpayers may not be able to successfully authenticate to, for example, access their prior year tax information or have IRS release a frozen refund. Conversely, if the process is too easy, fraudsters will likely be able to authenticate as easily as legitimate taxpayers.

Notably, one way that the IRS has overburdened taxpayers is in the false detection rate of the Taxpayer Protection Program's filters (NTA 'Objectives Report', 2018). This is the rate at which legitimate tax returns are flagged as fraudulent, thus forcing the

taxpayer to verify their identity with the IRS. There has been a marked increase in the false detection rate of the filters over the years, from 20% in 2014 to 63% in 2019, even though the number of cases of IDT tax refund fraud has fallen over the years (NTA, 2020). In 2017, 1.9 million taxpayers were forced to verify their identities with 1.17 million completing the verification (GAO, 2018). In 2016 over USD 9 billion in legitimate refunds were delayed for an average of approximately 36 days (NTA, 2016). While this delay may not seem significant, it may impose significant hardship on low-income taxpayers. Low-income taxpayers often rely on their tax refund, of which the average was around USD 2,800 in 2016 to pay for various expenses and such delays can have a major impact in their lives (Greene, 2013; GAO, 2014; NTA, 2016).

TIGTA (2018) reports that there were 114 filters in place in 2014 and this grew to 200 filters by 2018. A high false detection rate from these filters has both a monetary cost to the IRS as employees must then deal with the authentications of legitimate taxpayers, but it may also lead to a side effect of decreased employee morale. NTA (2016) reports that studies have shown that when false detection rates exceed 25:1 employees become more careless as they assume their actions will not actually uncover fraud, therein decreasing employee engagement.

The process by which taxpayers must authenticate their identity has also been shown to be overly burdensome. High risk taxpayers must verify their identity in-person at a Taxpayer Assistance Center, of which there are around 400, by providing a government issued ID (GAO, 2018). In some cases, the closest office may be hundreds of miles away, or the closest one may not have available appointments for over a month, so if the taxpayer is low-income, or does not have access to transport, or is working multiple jobs, this is a daunting task that imposes substantial harm (NTA, 2017b). Low risk taxpayers can verify their identity over the phone, and while this may not seem overly burdensome, in many instances it is. For the 2016 filing season, the phone line received around 4.4 million calls, but it had a level of service (LOS), which is the proportion of phone calls that are answered versus the taxpayer hanging up before an operator answers, of only 22.7% on average which was the worst performance for any high-volume line operated by the IRS (NTA, 2016).

Given the IRS simply does not have sufficient resources devoted to these phone lines for it to be an effective method of authentication, this leads to additional frustration for fraud victims who are then forced through this authentication process when they are already under significant stress dealing with a stolen identity. Apart from tax fraud, IDT victims most likely will also have to deal with other types of IDT fraud (including utility, phone, bank, and employment fraud), and these can be problematic to remedy. NTA (2013) notes that psychiatrists have stated that the symptoms of IDT victims are similar to those of individuals suffering from post-traumatic stress disorder and it is therefore cruel to put these taxpayers through such a burdensome authentication process during such a vulnerable time (NTA, 2013).

4.2 *Taxpayer First Act 2019*

Apart from Congressional requests to oversight agencies (e.g., the GAO), Congress has shown its willingness to enact oversight legislation via the *Taxpayer First Act*. This Act was introduced with effect from 1 July 2019 to broadly redesign the IRS, expand and strengthen taxpayer rights, and enhance the IRS's cybersecurity. The *Taxpayer First Act* included the following four specific measures to increase protections and further assist identity theft victims (TIGTA, 2020):

(1) The IRS must create a program in which taxpayers, concerned that they may be a victim of identity theft, can request an Identity Protection Personal Identification Number (IP PIN) to file a tax return (section 2005).

(2) The IRS must establish a single point of contact for taxpayers who are a victim of identity theft. The single point of contact shall track the taxpayer's case to completion and coordinate with other IRS employees to resolve the case as quickly as possible (section 2006).

(3) The IRS must notify taxpayers when the IRS determines or suspects unauthorised use of the identity of an individual (identity theft), including the unauthorised use of the identity of the individual to obtain employment (section 2007).

(4) The IRS must develop and implement publicly available guidelines for management of cases of stolen identity refund fraud. The IRS must consult with the National Taxpayer Advocate and implement the guidelines not later than one year after the date of enactment (section 2008).

4.3 Recent outcomes and future measures

This section presents recent data on IDT tax refund fraud and what actions the IRS might take moving forward to both combat the fraud and protect public revenue, while still serving taxpayers' needs.

4.3.1 Recent outcomes

Despite the fact that the precise amount of fraud is incredibly difficult to estimate, as a whole the IRS has been shown to be making progress towards abating the problem. Even more encouraging is that it appears that the amount and rate of successful fraud are on the decline. The IRS reports three key metrics on IDT tax refund fraud.[4] Between 2015 and 2019, the number of taxpayers reporting they were IDT victims fell by 80%. This is based on taxpayers who file Form 14039 identity theft affidavits. In 2019, the IRS received 137,000 affidavits from taxpayers compared to 677,000 in 2015. This was the fourth consecutive year the number of affidavits received declined – based on the receipt of 199,000 affidavits in 2018, 242,000 in 2017, and 401,000 in 2016.

In addition to Form 14039 affidavits, between 2015 and 2019, the number of confirmed IDT theft tax returns stopped by the IRS declined by 68%. For 2019, there were 443,000 confirmed identity theft tax returns compared to 1.4 million in 2015. Starting in 2019, the IRS now allows victims more time to respond to inquiries about the questionable return, but the side effect is that this slows down the verification process. Given there were 649,000 confirmed identity theft returns in 2018, 597,000 in 2017 and 883,000 in 2016 remarkable progress has been made.

The final metric to examine is the amount of potentially fraudulent tax refunds prevented by the IRS. Again, for the period between 2015 and 2019, the IRS protected USD 26 billion in fraudulent refunds by stopping confirmed identity theft returns. In 2019, the 443,000 confirmed fraudulent returns sought to obtain USD 1.9 billion in

[4] See Internal Revenue Service, *Security Summit*, http://www.irs.gov/newsroom/security-summit.

refunds. In comparison, the IRS protected USD 3.1 billion in 2018, USD 6 billion in 2017, USD 6.4 billion in 2016 and USD 8.7 billion in 2015 – a 78% decrease overall.

4.3.2 Future measures

Despite these recent successes and the positive trends over the period 2015-2019, more can be done. The IRS could improve its authentication services, but opening more offices or increasing its phone line staffing would both be costly options for the chronically underfunded agency (NTA, 2019). Online methods are the most cost-effective methods of authentication for the IRS, but these can only be used for low-risk cases where taxpayers must answer questions based on prior years' tax returns, or for high-risk individuals who have set up multi-factor authentication with an IRS database. This method authenticates the taxpayer by sending a code to a mobile phone, thus ensuring the taxpayer possesses the phone, but if it has not been set up beforehand the taxpayer cannot use this method as a fraudster could simply set up the system with their own phone number, therefore making it worthless (GAO, 2018).

The IRS could also work to improve its filters and systems to decrease false detection rates and therefore the number of individuals who need to authenticate, and who then suffer delays in receiving their tax refunds. One possibility might be to create a filter system that implements machine learning that relies on models instead of simple binary rules (NTA, 2018). It could also use predictive models to determine more accurately the number of filters necessary, and adjust the filters more regularly, as in 2016 one filter had a false detection rate of around 91% and thus could have been discarded before the end of the filing season if the IRS possessed real time analytics (NTA, 2016). The IRS could also partner with financial industry experts with a proven track record of creating such systems and with the collaboration offered by the Information Sharing and Analysis Center, NTA (2016) considered this to be a beneficial opportunity. In a hearing before the House Committee on Oversight and Government Reform in April 2018, the IRS Commissioner agreed to try and bring false detection rates down to at least 50% (NTA, 2018).

Consistent with the provisions of the *Taxpayer First Act 2019*, the IRS expanded the IP PIN program into an optional nationwide scheme from January 2021 (three years ahead of the Act's July 2024 deadline). The number of PINs issued has steadily grown, from around 250,000 in 2012 to roughly 3.5 million in 2017, but hitherto this was only for prior victims of IDT refund fraud and residents of Florida, Georgia, and the District of Columbia who opted-in (Thorne & Stryker, 2015; GAO, 2018). By requiring every taxpayer to file with an IP PIN, the IRS could see impressive results – as an estimated USD 193 of revenue was protected for every taxpayer who received an IP PIN in 2014. As the cost of issuing IP PINs is only USD 36 for a three-year period, NTA (2015) calculates that on average, every dollar spent on the program has a USD 5.36 return. The question of where the original funding could come from may already be answered. Currently if a company such as Equifax is to blame for a massive data-breach, it will offer victims credit monitoring services, so the IRS could therefore attempt to shift this financial burden to the private sector, at least partially, especially as the rate of large-scale data breaches is growing. The only issue with this program is that the IP PIN would therefore become another piece of PII that fraudsters could steal, although it would at least make the fraud more difficult. Such a theft already occurred in March 2016 when hackers were able to obtain over 100,000 IP PINs by exploiting the IP PIN retrieval tool, and thus the system is not without its own vulnerabilities (GAO, 2017).

The most effective, but also most controversial tactic of combating IDT tax refund fraud would be to delay the tax filing season or refund issuances. This would allow the IRS to fully match return data with Form W-2s and give taxpayers more time to respond if their identity had been stolen. Unfortunately, this would likely have a disastrous impact on low-income taxpayers who rely on their tax refunds to survive (Greene, 2013) and such a course of action seems extremely unlikely.

5. IMPLICATIONS OF IDENTITY THEFT TAX FRAUD

5.1 Individual prevention

Individuals can pre-emptively take action to ensure that they are not victims of IDT tax refund fraud. The most obvious tactic is for the taxpayer to submit their individual tax return early in the filing season. If an individual files their return before fraudsters can, then taxpayers can drastically reduce the chance that they will become victims of the fraud (Chambers & Zeidan, 2013). This is by far the most effective method but given human nature to procrastinate on filing one's own taxes, it may also prove to be a difficult tactic to achieve.

Obviously, individuals should protect their PII and be wary of phishing attempts. These can take many forms, ranging from a call saying someone won a sweepstake, to an email that is purportedly from the IRS demanding action to avoid a fine, to even more advanced methods of emails that are 'spoofed' to look like they come from an employee at a place of work. The IRS regularly posts new forms of phishing and what taxpayers should be on the lookout for.[5]

Physical forms of PII should also be protected, i.e., never carry around such documents if it can be avoided, shred documents before disposal, protect incoming mail etc., and electronic PII can be safeguarded by keeping anti-virus software up to date, installing firewalls on home networks, visiting secure websites, taking care in the disposal of old computers/phones, and using strong, unique passwords as a rule of thumb. Moreover, individuals should regularly scan their own credit reports and bank statements to check for suspicious activity. Finally, IDT protection services can be used to protect/monitor one's identity, e.g., *LifeLock*, *Experian*, and *IdentityForce*.

Unfortunately, identity thieves target low-income taxpayers with poor credit and this group is also evidenced as being the most vulnerable to attack, together with identity theft occurring within abusive relationships (Dranoff, 2014). The delay in issuing tax refunds, described in section 4, is thus likely to interfere with recipients of the Earned Income Tax Credit and the low-income portion of the Child Tax Credit – two of the largest anti-poverty programs in the US. Greene (2021, p. 124) concludes that this leaves low-income IDT victims in a financial crisis, within a 'confusing system with few remedies that actually help them, and a mind-boggling number of steps and outreaches necessary to begin to recover their financial health. It is usually too little, too late'.

5.2 Tax professionals and cyber breach

Individuals may employ additional measures to give themselves peace of mind. Often when external tax preparers are used, e.g., via a certified public accountant or a tax

[5] See www.irs.gov/identity-theft-central.

preparer firm, this other entity will assist with the authentication process should one's identity be stolen. Some firms may charge an additional fee or offer add-on insurance that can be purchased separately. While this will not prevent the fraud from occurring, it will at least mean that taxpayers do not have to deal with the fallout from the fraud by themselves. Individuals can also file Form 8821 Tax Information Authorization, which means that if a return is filed in the taxpayer's name, they will receive a notification. Again, this does not prevent fraud, but if a person contacts the IRS before a refund is issued on the phony return, this can vastly accelerate the receipt of the legitimate refund while simultaneously preventing a fraudulent one (Thorne & Stryker, 2015).

Because tax preparation firms may themselves be targeted by fraudsters, the IRS recommends that tax professionals take critical steps to not only protect their clients, but also themselves from identity theft. Tax professionals must implement and maintain a data security plan and comply with Federal Trade Commission regulations and report any data theft immediately to local IRS liaisons and states for which the firm prepares returns – with detailed information contained in IRS Publications 4557 (Safeguarding Taxpayer Data) and 5293 (Data Theft Resource Guide for Tax Professionals).

Cybersecurity of professional firms, tax agencies, and even countries may also affect the ability of tax agencies in their desire to establish digital platforms and make taxes digital for taxpayers (Brink & Hansen, 2020; Ngugi et al., 2021). Hatfield (2018) notes that the US faces serious cybersecurity problems and that the IRS is itself a cyberattack target with taxpayer account information and databases reflecting a 'treasure trove of information' for criminals. Relatedly, then National Taxpayer Advocate Nina Olson's (2018, p. 2) personal comment at her plenary session at the 13th International Conference on Tax Administration, reveals the enormity of this issue: 'Cybersecurity, in fact, may prove to be the most significant impediment to broad digital usage in the US tax system', leading to her conclusion that encouraging the use of digital platforms, is not as simple, nor as desirable, as it first appears.

5.3 Tax compliance effects

There are virtually no scholarly publications on the effects of IDT on tax compliance itself. However, there are a small number that study the effect on taxpayers who have been subject to identity theft. For example, Kaspar et al. (2017) examine taxpayer attitudes and how they are influenced by IRS audits and identity theft investigations. Surprisingly, they find that only about 35% of taxpayers who experienced an IRS investigation involving a potentially fraudulent refund claim by someone improperly using their identification managed to recall the incident and they conclude that further research is necessary on how the duration and effectiveness of IDT tax refund fraud investigations affect taxpayer attitudes and behaviour.

Farrar, Hausserman and Pinto (2020) report on an experimental study that finds that the positive association between IRS responsibility for preventing identity theft tax refund fraud and future tax compliance intentions is mediated by trust in the IRS. Specifically, they find that when a tax authority is not to blame for IDT higher responsiveness by the tax authority significantly influences compliance through trust, but this effect is not present if the tax authority is to blame for the identity theft in the first instance. It seems plausible that the results of Farrar et al. (2020) may be relevant to general cybersecurity lapses in tax agencies as well.

6. CONCLUDING REMARKS

This article highlights IDT tax refund fraud as comprising a significant ongoing problem in the US tax system. Using information from public reports, we describe the problem and the overall response from the IRS and oversight agencies over the last three decades. OECD (2006) notes that IDT is a nuanced issue for tax agencies and this article shows that tax agencies must evaluate many factors including, but not limited to, the resourcing of tax agencies, decisions on how to effectively respond to the threat of IDT and evaluating the consequential effects on taxpayer burden and tax compliance. Ultimately, the problem has the potential to affect strategies on the digitalisation of tax systems.

Within the US, IDT tax refund fraud has been a high priority, in terms of resources devoted to the problem, and it has remained high on the annual IRS 'Dirty Dozen' list of scams since 2013. While the IRS certainly has not eliminated the fraud in its entirety, it is trending downwards, although it is difficult to point to a single tactic employed by the IRS as the 'most effective'. In this regard NTA (2017a) does however suggest that the improvement of the filters and systems the IRS uses, notably the implementation of the Return Review Program and the fact that the Form W-2 deadline was moved forward, were the primary causal drivers of the decrease in IDT tax refund fraud.

In the future, IDT tax refund fraud is likely to remain a constant threat as fraudsters will not simply let the IRS 'win' and will instead adapt and evolve their techniques to circumvent IRS filters. The full magnitude of the problem is still unknown, and the IRS must balance the importance of protecting public revenue versus the creation of remedial processes for taxpayer victims that are overly burdensome.

A recent example of how fraudsters have shifted emphasis and evolved is provided by the growing rise and threat of business-related refund fraud. This occurs when an employer's business information is fraudulently obtained, e.g., using an Employer Identification Number to commit fraud, so the challenges posed by individual IDT are also relevant to business IDT. In fact, the problem may be even more challenging given the ease with which business information is available, and the complexity of the business tax reporting environment (GAO, 2020a). A specific example of fraudsters evolving their methods is with employment-related identity fraud, which occurs when fraudsters use a name or social security number other than their own to obtain employment (e.g., if they are not authorised to work in the US or are trying to avoid maintenance payments, etc.), or to fraudulently receive Covid pandemic-related payouts. Victims may then face federal and state enforcement actions based on the wages earned, but unreported, by fraudsters (GAO, 2020b).

With a small number of notable exceptions as have been cited above, there are few peer-reviewed publications on the topic. However, this article is a call to action, as there are multiple areas for scholars to investigate in relation to the potential consequences of IDT tax refund fraud – including the resourcing of tax administrations and how they should implement internal systems and programs to deal with the fraud, how tax agencies can safeguard the PII of taxpayers and employers from fraudsters under tax system digitalisation initiatives, addressing the disproportionate effects of IDT fraud on low-income taxpayer victims including the financial and administrative burden placed on this group, and investigating any consequential effects of the fraud on taxpayer attitudes and compliance.

Finally, our study is limited in scope in that we do not examine other tax agencies' responses to identity theft refund fraud or the extent of the issue in other jurisdictions (e.g., Tzani-Pepelasi et al., 2020; Leighton-Daly, 2019). We also do not examine in detail, the emerging areas of business-related and employment-related tax refund fraud and general issues of tax reform and cybersecurity (Hatfield, 2018; Alm et al., 2020). All of the challenges described herein, seem likely to significantly impact tax administrations and influence taxpayers' level of trust in their own tax agencies.

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The association of mandatory tax disclosures with the readability and tone of voluntary tax reports

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Abstract

This article examines companies with low comparative tax payable (*public exposure – scrutinised*), compared to companies with higher comparative tax payable (*public exposure – low scrutiny*) according to mandatory tax reports (MTRs), for differences in readability and tone in their respective voluntary tax reports (VTRs). In doing so, the authors posit three key opportunities for companies to control the tax narrative through tone and readability: (1) lack of available tax information; (2) lack of alignment between the accounting and taxation systems; and (3) latitude available in voluntary disclosures. The analysis reveals overall that a high (low) effective tax rate is associated with a more (less) readable VTR and a VTR with a more positive (negative) tone. When the companies are segregated, it is noted that *public exposure – scrutinised* companies are found to resort to the tone in tax reporting, whereas those with lower scrutiny rely on the readability of reports.

Key words: Voluntary reporting; mandatory tax reporting, public scrutiny, political exposure, corporate taxation; tone; readability; tax transparency, Australia, tax compliance.

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1. INTRODUCTION

Tax information in Australia, as with most forms of personal information, is traditionally protected through secrecy provisions in Division 355 of Schedule 1 to the *Taxation Administration Act 1953* (Cth) – the punishment for disclosing protected information being a term of imprisonment. Jurisdictions such as Norway,[1] Finland,[2] Sweden[3] and Denmark,[4] by comparison, view tax information as a social right, and make available (through a web portal administered by the relevant tax authority) to the public certain tax information disclosed in a tax entity's tax returns.[5] Although no longer in place, Italy, France and Japan[6] formerly had similar public disclosure regimes.[7] This article fills a gap in the literature by conducting an empirical study of the association of mandatory tax disclosures on the readability and tone of voluntary tax reports in Australia.

Although a firm's financial statements are, pursuant to accounting standards (including both the International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles (GAAP)), an important source of information to stakeholders, concern about the ability of tax disclosures to meet users' material fiscal inquiries exists.[8] Australia, in recent times, has begun to see a notable regulatory shift – which has focused on larger businesses – towards more publicly transparent and scrutinised tax affairs. Enacted in 2013 and implemented in December 2015, national laws require the disclosure of certain information about specified companies, including their total income, taxation income and tax paid, collectively referred to as mandatory tax reports (MTR).[9] These are generated by the government on an annual basis and available online.[10] Further and contemporaneously, there exists an optional layer of voluntary tax disclosure. In order to facilitate '…greater disclosure to help build confidence in the majority of Australian businesses that do the right thing',[11] the Board of Taxation developed, at the Australian Government's request, the Tax Transparency Code (TCC) for the purposes of voluntary tax reporting (VTR).[12] Notwithstanding the infancy and

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[1] See the Tax Assessment Act (2016) (*Melding om trekk mv),* § 8-8. See also Regulations on the Processing of Personal Data (2013).
[2] See Constitution of the Republic of Finland (1999, amended 2011), s 12.
[3] See Instrument of Government (1994, amended 2015), Ch 2, Art 1.
[4] See the Act on Processing of Personal Data (2000, as amended 2007), Ch 8, Title III.
[5] Ken Devos and Marcus Zackrisson, 'Tax Compliance and the Public Disclosure of Tax Information: An Australia/Norway Comparison' (2015) 13(1) *eJournal of Tax Research* 108; Therese Catanzariti, 'Transparency of a Tax System – Beware of Glass Houses!' (2004) 47 *Weekly Tax Bulletin* [1962].
[6] Japan's tax disclosure regime had been in place since the 1950s; however, it was abolished in 2005 after assertions were made that disclosures were being linked as a factor in causing crime and harassment, something largely inconsistent with the original aim. See, eg, Makoto Hasegawa, Jeffrey L Hoopes, Ryo Ishida and Joel Slemrod, 'The Effect of Public Disclosure on Reported Taxable Income: Evidence from Individuals and Corporations in Japan' (2013) 66(3) *National Tax Journal* 571.
[7] Erland E Bø, Joel Slemrod and Thor O Thoresen, 'Taxes on the Internet: Deterrent Effects of Public Disclosure' (Discussion Paper No 770, Statistics Norway Research Department, January 2014).
[8] See, eg, European Financial Reporting Advisory Group and the Financial Reporting Council, 'Improving the Financial Reporting of Income Tax Feedback Statement' (Feedback Statement, February 2013).
[9] *Taxation Administration Act 1953* (Cth), ss 3C-3E and related provisions, introduced by *Tax Laws Amendment (2013 Measures No 2) Act 2013* (Cth) and amended by *Tax and Superannuation Laws Amendment (Better Targeting the Income Tax Transparency Laws) Act 2015*.
[10] See generally Australian Government, 'Corporate Tax Transparency', https://data.gov.au/data/dataset/corporate-transparency.
[11] Board of Taxation, *A Tax Transparency Code: A Report to the Treasurer* (2016) 5, https://taxboard.gov.au/sites/taxboard.gov.au/files/migrated/BoT_TransparencyCode_Final-report.pdf, 5.
[12] Ibid.

present voluntary nature of VTR in Australia, however, there are a growing number of entities that are opting to become signatories for the code.[13]

It is the *voluntary* nature of the VTRs spurred by the TTC that is the focus of this article. In particular, the authors examine signatories to the TTC to identify whether the level of public exposure (scrutinised/low scrutiny) arising from MTRs impacts the readability and tone of VTRs. The term *readability* refers to the level of opaqueness, or obfuscation, in the information environment: in which an author prepares more complex, *less readable*, information.[14] As Beuselinck and co-authors state, complexity within the information environment reduces transparency as 'more time and effort from outsiders to become properly informed' is required, thereby obscuring the ability to understand.[15] *Tone* refers to the sentiment of the disclosures, being the extent to which reports contain terms with optimistic or pessimistic sentiment that capture 'the affect or feeling of a communication'.[16]

The motivation for this study is based on three primary factors as follows. First, corporate taxation has gained substantial spotlight in recent times. In a recent outline, the Board of Taxation noted concern about taxation anti-avoidance in stating that '[t]he actions of a few businesses, particularly large multinationals engaging in aggressive tax avoidance, have tarnished the reputations of many businesses that are doing the right thing'.[17] In addition to section 3C of the *Taxation Administration Act 1953* (Cth) requiring the annual preparation of a Report of Entity Tax Information for certain corporate tax entities, fairness and transparency have been cornerstone in Australia. The wave of condemnation arising from the 'Panama papers' in 2016 and the 'Paradise papers' in 2017,[18] or multinational companies such as Apple, are just some examples of the growing public concern over fairness and transparency in the Australian taxation system.[19]

Although a firm's financial statements are seen as an important source of information, the usefulness of tax disclosures has been of concern for some time.[20] It has already

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[13] See Australian Government, 'Voluntary Tax Transparency Code: VTTC Reports' (31 May 2021), https://data.gov.au/dataset/ds-dga-f71709a8-2eeb-4592-ad1f-443f7f520186/distribution/dist-dga-e44e9729-30f5-4764-848e-f060f5099277/details?q.

[14] Christof Beuselinck, Belen Blanco, Sandip Dhole and Gerald J Lobo, 'Financial Statement Readability and Tax Aggressiveness' (2018) *SSRN Capital Markets: Market Efficiency eJournal*, 4.

[15] Ibid. As such, the terms 'obfuscation', 'readability' and 'complexity' of reports are used interchangeably in this article. See also Feng Li, 'Annual Report Readability, Current Earnings, and Earnings Persistence' (2008) 45(2-3) *Journal of Accounting and Economics* 221; Leopold Bayerlein and Paul Davidson, 'The Influence of Connotation on Readability and Obfuscation in Australian Chairman Addresses' (2011) 27(2) *Managerial Auditing Journal* 175.

[16] Elaine Henry, 'Are Investors Influenced by How Earnings Press Releases Are Written?' (2008) 45(4) *Journal of Business Communication* 363, 399-401.

[17] Board of Taxation, above n 11, 5.

[18] These revealed that offshore entities were being used for illegal activities, such as tax evasion. See for example Will Fitzgibbon and Dean Starkman, 'The "Paradise Papers" and the Long Twilight Struggle Against Offshore Secrecy', *International Consortium of Investigative Journalists* (Web Page, 27 December 2017), https://www.icij.org/investigations/paradise-papers/paradise-papers-long-twilight-struggle-offshore-secrecy/; 'Giant Leak of Offshore Financial Records Exposes Global Array of Crime and Corruption', *International Consortium of Investigative Journalists* (Web Page, 3 April 2016), https://www.icij.org/investigations/panama-papers/20160403-panama-papers-global-overview/.

[19] Eg, Harry Grubert and John Mutti, 'Taxes, Tariffs and Transfer Pricing in Multinational Corporate Decision Making' (1991) 73(2) *The Review of Economics and Statistics* 285; Prem Sikka and Hugh Willmott, 'The Dark Side of Transfer Pricing: Its Role in Tax Avoidance and Wealth Retentiveness' (2010) 21(4) *Critical Perspectives on Accounting* 342; Nor Shaipah Abdul Wahab and Kevin Holland, 'The Persistence of Book-Tax Differences' (2015) 47(4) *The British Accounting Review* 339.

[20] European Financial Reporting Advisory Group and the Financial Reporting Council, above n 8, 2.

been noted that a thorough analysis of user needs is required before moving ahead with any changes to or the development of a new standard.[21] The misalignment between the accounting and taxation systems has, more recently, been highlighted as problematic – with disclosures within general purpose financial statements being 'blurred' through the application of tax effect accounting, as well as complicated by differences in methodologies between the two systems, such as differing consolidation regimes.[22] These differences largely stem from differing historical developments, a discussion of which is beyond the scope of the present article.[23] The Board of Taxation study released in 2016 is arguably a step towards filling that void to reduce incoherence with tax information in annual tax transparency reports.[24]

The Macquarie Dictionary[25] refers to *transparency* for organisations as being related to the policy or practice of making operations readily open, clearly evident, to public scrutiny and being accountable for those operations. Generally, to be *transparent* means having a property that allows any bodies situated beyond or behind to be distinctly seen, to be easily understood.[26] The authors argue that for disclosures to be fit for purpose, there needs to be a bridge between enterprise activity and their respective contributions to the Australian tax system that can be readily understood by stakeholders, and encourage accountability of such contributions. This is particularly challenging to achieve from the outset due to the lack of available tax information due to privacy regulations and the lack of alignment between the accounting and taxation systems leading to a disconnectedness in available tax information.[27]

Second, corporate entities have a high degree of discretion in managing their internal tax affairs, the result being a shift away from a traditional position to disclosure. Extant research has often had to rely on proxy measures for corporate income tax.[28] With the release of the TTC, and a steady stream of companies becoming signatories to that code and which produce VTRs, a novel level of disclosure is apparent. VTRs, therefore, provide a new insight into corporate tax affairs not previously available in Australia to this extent.

Third, the voluntary nature of VTRs gives rise to a wider latitude towards the qualitative presentations within disclosures made by corporate entities and which presents specific opportunities for entities to strategically obfuscate what is purported to be an approach to increase transparency of the tax affairs of corporate entities. This is, insofar as the content is mandated and uniform across time, similar to annual reports.[29] Due to the recent introduction of VTRs in Australia, there is no existing research examining the correlation between readability and tone of a firm's financial disclosure. Critically, extant research suggests that scrutiny and public exposure is linked to *tone* and

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[21] Ibid.
[22] Elizabeth Morton, 'Corporate Tax Transparency Reporting and Benford's Law' (2019) 34(1) *Australian Tax Forum* 1.
[23] See Elizabeth Morton, 'A Historical Review of the Rise of Tax Effect Accounting as a Financial Reporting Norm' (2019) 24(4) *Accounting History* 562.
[24] Board of Taxation, above n 11, 4.
[25] See 'Transparency', *Macquarie Australian Encyclopedic Dictionary* (2006).
[26] Ibid.
[27] Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22, 19-21.
[28] See generally B Brian Lee, Alfreda Dobiyanski and Susan Minton, 'Theories and Empirical Proxies for Corporate Tax Avoidance' (2015) 17(3) *Journal of Applied Business and Economics* 21.
[29] Lorenzo Patelli and Matteo Pedrini, 'Is Tone at the Top Associated with Financial Reporting Aggressiveness?' (2015) 126(1) *Journal of Business Ethics* 3.

readability,[30] and therefore companies may use disclosures as instruments for social control of and over the narrative.[31]

With the aforementioned in mind, this article examines signatories to the TTC to assess whether categorising companies as *public exposure – scrutinised* (comprising companies having low comparative tax payable as per mandated tax transparency report), compared to *public exposure – low scrutiny* (higher comparative tax payable as per the mandated tax transparency report), will lead to differences in readability and tone in VTRs. By doing so, the authors ask, *does the level of public exposure (scrutinised/low scrutiny) arising from mandatory tax reporting impact readability and tone of voluntary tax reporting?*[32]

The authors posit three key opportunities that entities have in controlling their tax narrative via VTRs:

1. The general lack of available tax information due to privacy regulations;
2. The lack of alignment between the accounting and taxation systems leading to a disconnectedness in available tax information; and
3. The general latitude available in voluntary disclosures.

Two hypotheses are made. First, that companies with *public exposure – low scrutiny* prepare VTRs which are easier to read; and, second, that companies with *public exposure – scrutinised* prepare more optimistic voluntary tax reports. Despite the attempts for companies to control the narrative through obfuscation,[33] government attention may – and noting research by Beuselinck and co-authors[34] and Hope, Ma and Thomas[35] – lead to improvements in readability.

This article is structured as follows: section 2 outlines the background, briefly considering the need to balance privacy and tax transparency and the developments in Australia with respect to mandatory and voluntary tax disclosures. Section 3 sets out the literature and identified gaps in extant research and in doing so, clarifies the present study's focus. Section 4 follows by articulating the research question and hypotheses. Section 5 presents the research design, followed by the key findings, discussion and analysis in section 6. Section 7 summarises and concludes the article, with the main findings, tax policy implications, also limitations and future research.

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[30] See n 15, above.

[31] Daphne A Jameson, 'Telling the Investment Story: A Narrative Analysis of Shareholder Reports' (2000) 37(1) *Journal of Business Communication* 7, 9. See also Li, above n 15; Henry, above n 16; Apostoles A Ballas, 'The Creation of the Auditing Profession in Greece' (1998) 23(8) *Accounting, Organizations and Society* 715.

[32] While there are other, broader notions of the concept of 'scrutiny' (eg, BHP Billiton having an ETR close to the statutory rate but facing high scrutiny in the public's eye), the present article operationalises scrutiny as relating directly to public exposure via the publicised ETR: see further Baljit K Sidhu and Greg Whittred, 'The Role of Political Costs in the Deferred Tax Policy Choice' (2003) 28(1) *Australian Journal of Management* 63, discussing 'politically acceptable threshold'. The concept of scrutiny is expanded upon in section 4 and the 'publicly acceptable threshold', where companies are anticipated to face increased scrutiny, is further discussed in section 5.2 of this article.

[33] See, eg, Jameson, above n 31, 9. See also generally Li, above n 15.

[34] See Beuselinck et al, above n 14, 4.

[35] Ole-Kristian Hope, Mark (Shuai) Ma and Wayne B Thomas, 'Tax Avoidance and Geographic Earnings Disclosure' (2013) 56(2-3) *Journal of Accounting and Economics* 170.

2. BACKGROUND

2.1 Australian developments in balancing privacy and transparency

Emergent steps in the removal of a veil of secrecy[36] in Australia were present before high-profile cases. This arguably began with the tax transparency reporting regime that was introduced in 2013 in the *Tax Laws Amendment (2013 Measures No 2) Act 2013* (Cth), later amended by the *Tax and Superannuation Laws Amendment (Better Targeting the Income Tax Transparency Laws) Act 2015*. Certain disclosures (eg, an enterprise's name, Australian Business Number (ABN), total income, taxable income and tax payable) from tax return information was thereafter reported in an annual tax transparency report (MTR). This was implemented in December 2015, with the 2013-14 tax year report being the first published.[37]

Marriott[38] has noted a broader global context in which this issue can be set. Marriott argues that while 'sunlight is the best disinfectant' – in that increasing transparency will reduce corruption – the protection of a country's international reputation is likely to be the greater catalyst for change.[39] Specific government justifications were noted, including the concern of the Group of Twenty (G20) major economies and Organisation for Economic Co-operation and Development (OECD) over base erosion and profit shifting (BEPS) by multinational entities; the aim being to discourage aggressive tax practices and inform public debate over corporate tax policy.[40]

These developments are set within a broader context, which has seen the introduction of tax transparency reporting in Australia, as well as the G20 and OECD recommendations and other initiatives that focus on reporting measures for corporate entities. The Tax Avoidance Taskforce, for example, focused its attention on the top 1,000 multinational and public companies, and top 320 private groups as well as controlling wealthy individuals.[41] In one Australian Taxation Office media release, it was confirmed that AUD 5.6 billion in extra tax had been collected by the taskforce over the two-year period.[42] The media announcement also noted that the Diverted Profits Tax, transfer pricing laws and anti-avoidance powers, and country-by-country[43] reporting are all having a significant effect.[44]

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[36] *Taxation Administration Act 1953*, Sch. 1, Div. 355.

[37] The 2013-14 report captures large public companies, being those with an annual income in excess of AUD 100 million. The following years the report was broadened to include private companies with over AUD 200 million annual earnings.

[38] Lisa Marriott, 'Tax and Corruption: Is Sunlight the Best Disinfectant? A New Zealand Case Study' (2017) 15(2) *eJournal of Tax Research* 262.

[39] Ibid.

[40] See Explanatory Memorandum to the Tax and Superannuation Laws Amendment (Better Targeting the Income Tax Transparency Laws) Bill 2015, [1.13]. Note also concern over the consequences of these disclosures, including the consequence of closely held company disclosures effectively revealing owners financial affairs, commercial sensitivity and personal privacy and security for private companies (which is a genuine concern if Japan's example is considered: see also Hasegawa et al, above n 6. Other concerns also include impact on competition and advantage to larger companies; restructuring to avoid disclosures; disproportionate cost to private companies to disclosure additional information to protect their reputation: see Explanatory Memorandum to the Tax and Superannuation Laws Amendment (Better Targeting the Income Tax Transparency Laws) Bill 2015, [1.14]-[1.18].

[41] Australian Taxation Office (ATO), 'Tax Avoidance Taskforce Helps Net $5.6 billion in First Two Years' (Media Release QC 56966, 11 October 2018) 1.

[42] Ibid.

[43] Board of Taxation, above n 11, 21, noting that country-by-country reporting 'is designed as a risk management tool for revenue authorities rather than a public disclosure regime'.

[44] Ibid.

The Multinational Anti-Avoidance Law (MAAL) has also resulted in restructuring of some global entities and is expected to result in billions of dollars in sales being 'returned to the Australian tax base' as well as additional goods and services tax (GST) payments.[45]

With these developments in mind, there is a substantial regulatory shift in Australia that is focused on more publicly transparent and scrutinised tax affairs with respect to larger businesses. The present study specifically considers the contemporaneous development of voluntary tax disclosures arising as a reasonably new approach to respond to the increasing concern over taxpayers' paying their 'fair share' of tax contributions, and the mandated release of the annual tax transparency reports.[46] The authors consider, in particular, the release of VTRs pursuant to the TTC.[47]

2.2 Voluntary tax reporting in Australia

As noted, voluntary tax reporting in Australia is still in its infancy. While some corporations have, over the past decade, been undertaking a level of voluntary tax reporting, a key move towards encouraging corporations to do so arose with the introduction of a framework for voluntary tax reporting initiated by the Australian government. This began with the 2015 Budget. Joe Hockey, the then Treasurer, wrote to the Board of Taxation requesting the development of a code as part of the 2015 Budget:[48]

> A voluntary code will provide a framework for large businesses to take the lead, to become more transparent and help educate the public about their compliance with Australia's tax laws.[49]

Following initial consultation with a Working Group[50] in September 2015, the receipt of 19 submissions,[51] and the release of a consultation paper in December 2015, the code was subsequently finalised in February 2016. The 2016-17 Commonwealth Budget announced the new voluntary TTC, highlighting that:

> The Government is committed to encouraging greater tax transparency within the corporate sector, especially by multinational corporations. The *Tax Transparency Code* will encourage businesses with an annual turnover of $100 million or more to publish information to support greater and better informed public scrutiny. The Government encourages all companies to adopt the Code from the 2016 financial year onwards.[52]

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[45] ATO, above n 41, per Deputy Commissioner Mark Konza, ATO.
[46] For example, responding to the potential reputational harm over what has been described as a naming and shaming policy.
[47] Board of Taxation, above n 11.
[48] Hon Joe Hockey (Treasurer), 'Consultation on Tax Integrity Proposals' (Letter to Michael Andrew, 12 May 2015), https://taxboard.gov.au/sites/taxboard.gov.au/files/migrated/2015/10/Letter_from_tsr_anti-hybrid.pdf; Hon Joe Hockey (Treasurer), 'Voluntary Corporate Disclosure Code' (Media Release, 12 May 2015).
[49] Board of Taxation, above n 11, 5.
[50] The working group included members of the Board of Taxation Michael Andrew (Chair), John Emerson AM, Ann-Maree Wolff and Neville Mitchell, an expert panel including Fiona Martin from the University of New South Wales, Victor Timos from Incitec Pivot and David Watkins from Deloitte and representatives from the ATO and Treasury. See further Board of Taxation, above n 11.
[51] See ibid.
[52] Australian Treasury, 'Making Our Tax System More Sustainable', Additional Budget 2016-17 Document (May 2016) 11.

The Board noted that the TTC had been developed in consideration of balancing public interest with business concerns (such as compliance costs, regulatory impact, commercial confidentiality, risk of misunderstanding information, and reciprocity and consistency issues between countries).[53] The Board of Taxation acknowledged that the reputations of many businesses doing the right thing had unfortunately been tarnished by the conduct of a few business (noting that these were primarily large multinationals) who were engaging in aggressive tax avoidance.[54]

The TTC sets out the principles and 'minimum standard' in the disclosure of tax information by businesses, dependent on business size,[55] whilst focusing on the company structures. The TTC is voluntary with the expectation that the disclosures will evolve over time as the company board and senior management become more actively involved and foster a culture towards addressing the public appetite for transparency. The alternative of a mandated code raises the concern that the disclosures would become a delegated 'box-checking exercise'.[56] This view is in contrast to the Commonwealth Senate Economics References Committee inquiry into corporate tax avoidance, which recommended a mandatory scheme rather than a voluntary scheme.[57] The Committee's aim in such a recommendation was to 'ensure that relevant information is available in order to maintain public pressure on aggressive tax practices' and the Committee did not believe that a voluntary scheme would 'suitably incentivise companies that push the letter and spirit of the law to publish tax information'.[58]

The TTC is targeting larger businesses, with a particular focus on the public interest. Table 1 provides a summary of the TTC.

[53] Board of Taxation, above n 11.
[54] Ibid 5.
[55] Ibid, referring to 'medium' and 'large' businesses based on 'aggregate TTC Australian turnover', medium businesses being those with a turnover of at least AUD 100 million but less than AUD 500 million, and large businesses those with a turnover AUD 500 million or more.
[56] Ibid.
[57] The Senate Economics References Committee, *Corporate Tax Avoidance, Part 1: You Cannot Tax What You Cannot See* (18 August 2015). See also Senate Economics References Committee, *Corporate Tax Avoidance, Part 2: Gaming the System* (22 April 2016.
[58] Senate Economics References Committee, *Corporate Tax Avoidance, Part 2*, above n 57, [3.12]-[3.13].

Table 1: Summary of Tax Transparency Code Minimum Standards

Part	Entity	Minimum Standard of Information	Explanatory Note
Part A[59]	Large and medium	A reconciliation of accounting profit to income tax expense, and income tax paid or income tax payable	A-IFRS General Purpose Financial Statement (GPFS) reconciliation is to income tax expense only.
		Identification of material temporary and non-temporary differences	The reconciliation should identify these material differences.
		Accounting effective company tax rates for Australian and global operations (pursuant to AASB guidance)	Given the variation in which ETR can be calculated, the business should clearly define the basis of this calculation and any underlying assumptions therein.[60]
Part B	Large	Approach to tax strategy and governance	Information should be provided as to: Approach to risk management and governance arrangements; Attitude towards tax planning; Accepted level of risk in relation to taxation; and Approach to engagement with the ATO Additionally, the following optional information is noted by the board as of interest to the community: Overview of business operations; Approach to engagement with other tax authorities; and Description of the assurance regimes.[61]
		Tax contribution summary for corporate taxes paid	Core element: Australian corporate income tax Optional elements: - Other taxes/imposts: eg, Petroleum Resource Rent Tax (PRRT), royalties, excises, payroll tax, stamp duties, fringe benefits tax (FBT), state taxes. - Government imposts collected on behalf of others: eg, GST, PAYG withholding taxes.[62]
		Information about international related party dealings	A qualitative explanation of the nature of international related dealings and measures of associated tax risks for management. Include key categories of dealings that have a material impact on Australian taxable income, the nature of the material categories and country of location. The Board acknowledges the potential for reputational damage from misunderstanding these disclosures; however, sees it as necessary given the community concern and media coverage.[63]

Source: Adapted from Board of Taxation, above n 11, 2.

[59] The Australian Accounting Standards Board (AASB) issued draft guidance on TTC recommendations for the suggested tax reconciliation and calculation of the ETR: see AASB, 'Invitation to Comment: Draft Appendix to the Tax Transparency Code' (May 2017) 11-12, https://www.aasb.gov.au/admin/file/content105/c9/ITC_Draft_Tax_Transparency_Code_Disclosures_05-17.pdf (discussing Regulatory Guide 230, 'Disclosing non-IFRS financial information regarding the risk of misleading users and promoting clear and full disclosures'). See also Australian Securities and Investments Commission (ASIC), 'Regulatory Guide 230: Disclosing Non-IFRS Financial Information' (9 December 2011), https://download.asic.gov.au/media/1241462/rg230-published-9-december-2011.pdf. According to the AASB website, two comment letters were received after the comment period closed in February 2018. One raised concern that the recommendations went beyond what was requested by the Board of Taxation: Ernst & Young, 'AASB Draft Appendix to the Tax Transparency Code' (28 February 2018), https://www.aasb.gov.au/admin/file/content106/c2/TaxTransparency_sub_1_EY.pdf. The other noted the need to promote the use of Plain English due to the intended audience: KPMG, 'Submission Invitation to comment - Draft Appendix to the Tax Transparency Code' (27 February 2018), https://www.aasb.gov.au/admin/file/content106/c2/TaxTransparency_sub_2_KPMG.pdf.

[60] Prior to the AASB guidance, the Board detailed that the ETR should be calculated as 'company income tax expense divided by accounting profit' and 'global ETR should be calculated "for the worldwide accounting consolidated group" of which the Australian operations form a part': Board of Taxation, above n 11, 18-19. KPMG, above, identified eight different ETRs that are explicitly recommended within the TTC and associated AASB guidance.

[61] Board of Taxation, above n 11, 19-20.

[62] Ibid 20.

[63] Ibid 21.

Disclosures by signatories to the TTC can occur within several contexts, including in the general purpose financial statements (GPFSs), in taxes paid reports, and corporate social responsibility (CSR) reports, for example, and are not required to be externally audited.[64] Unlike the alignment issues that arise with the mandated tax transparency reports released annually,[65] the Board of Taxation[66] indicated that disclosures should be capable of being reconciled to the income tax return and financial statements. The Board of Taxation is, nonetheless, aware of the discrepancy between its list of signatories and the ATO published data arising from the flexibility under the TTC, which ultimately 'makes comparisons less meaningful'.[67] The Board of Taxation has indicated that a separate report is likely to be more accessible to general users, be more user-friendly, avoid the need to incorporate the report into the audit process, and allow for more extensive qualitative information.[68] The Board does not prescribe the format or timing of release.

The TTC is directed towards a target audience of 'interested users', including social justice groups, the media, analysts, politicians, investors and shareholders, and 'general users', described by the Board of Taxation as 'the person in the street' and the community.[69] The Board of Taxation has stated that the target audience are these interested general users, rather than the ATO as the ATO already has access to more detailed tax information.[70] Although not a key user group, revenue and regulatory authorities, which includes the ATO, are listed as a third potential user group.

As at February 2020, 160 signatories of the TTC were identified,[71] with 139 of those having published at least one report and this number is slowly increasing. However, the Board of Taxation has noted that a number of the published reports are not meeting the minimum standard of the TTC. The Board of Taxation commenced a post-implementation review of the TTC in 2018, consulting with a range of stakeholders. A recent consultation paper outlined the following proposed amendments, including minimum standards being supplemented with 'best practices', which expand on optional elements; an addition of a new minimum standard for a 'basis of presentation' statement; a new minimum standard for a reconciliation to ATO public data disclosures;[72] and other improvements to minimum standards and best practice recommendations.[73]

Given that stakeholders may rely on the narratives in VTRs – comparable to 10-K reports filed with the United States' Securities and Exchange Commission – to interpret fundamental accounting information and that the readability of the narrative disclosures

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[64] See generally Board of Taxation, above n 11. If, however, Part A is disclosed in the GPFS, then the data will be subject to audit procedure. Furthermore, the disclosures produced generally will be derived from audited materials: Board of Taxation, above.

[65] See generally Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22.

[66] See generally Board of Taxation, above n 11, 23.

[67] Board of Taxation, 'Corporate Tax Transparency Code and Register', https://taxboard.gov.au/current-activities/corporate-tax-transparency-code-and-register (accessed 2 February 2022).

[68] Board of Taxation, 'CEO Update – February/March 2019' (Stakeholder Information Sheet, March 2019), https://cdn.tspace.gov.au/uploads/sites/74/2019/03/CEO_Update_March_2019.pdf.

[69] Ibid 4.

[70] Board of Taxation, above n 11, 23.

[71] See Australian Government, 'Voluntary Tax Transparency Code: VTTC Reports' (31 May 2021), https://data.gov.au/dataset/ds-dga-f71709a8-2eeb-4592-ad1f-443f7f520186/distribution/dist-dga-e44e9729-30f5-4764-848e-f060f5099277/details?q.

[72] This relates specifically to the issue of a lack of connection to the mandatory Tax Transparency Reports and considers an approach to bridge the gap between the TTC and mandatory reports.

[73] Board of Taxation, *Post-Implementation Review of the Tax Transparency Code: Consultation Paper* (February 2019), https://cdn.tspace.gov.au/uploads/sites/74/2019/02/TTC-Consultation-Paper-final.pdf.

has important implications for communicating value-relevant information effectively to the market participants,[74] firms filing VTR reports should be particularly cautious in their selection of language and text when preparing them. With the aforementioned backdrop in mind, the article now turns to consider the broader context and literature surrounding transparency of tax affairs, financial statement complexity, voluntary reporting and tone.

3. LITERATURE REVIEW

3.1 Balancing privacy with transparency

Devos and Zackrisson[75] have discussed, in detail, the rationale that underlies disclosure of taxation information – which they note as comprising: transparency, tax fairness and accountability, and also the principle against disclosure referred to as 'privacy'.[76] Of relevance is the general distinction between the *perceptions* and *actuality* of these principles. They note that the reasons for whether or not compliance may improve '…as a result of increased public disclosure generally relate to good governance and tax administration'.[77] They go on to highlight that the ATO seeks to achieve fairness in the tax system, through addressing issues of horizontal, vertical and exchange inequality; however, the fairness that is recognised as a benefit of disclosure relates to the *perception* of tax fairness. With regards to whether a disclosure of tax burden is considered 'fair', such an inquiry is moot since what comprises 'fair' is subjective, and dependent on the individual tax system.[78] Nerré,[79] for example, notes that tax policy advice should not disregard the tax-cultural setting and its inherent constraints.

Public disclosure of tax information is seen as an additional strategy for improving tax compliance, on top of more traditional strategies of audit, simplification and guidance.[80] From a tax compliance perspective, there continues to be a pervasive concern over corporations contributing their 'fair share' of tax to society, particularly surrounding purported tax avoidance or minimisation activities.[81] Tax avoidance behaviour is generally not observable, with a range of proxies utilised based on a variety of logic constructs, thereby limiting what is known about tax avoidance, including the relationship between financial disclosures and tax avoidance.[82] Hanlon and Slemrod's observations – regarding investor consequences being short-lived – may imply that firms seek not to be perceived as overstepping the line of tax avoidance if there is a risk that voluntary tax disclosures may allude to this conclusion.[83]

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[74] Tim Loughran and Bill McDonald, 'Measuring Readability in Financial Disclosures' (2014) 69(4) *The Journal of Finance* 1643.
[75] See generally Devos and Zackrisson, above n 5.
[76] Ibid; their analysis has been documented in the Appendix to this article.
[77] Ibid 109.
[78] Ibid 112.
[79] Birger Nerré, 'Tax Culture: A Basic Concept for Tax Politics' (2008) 38(1) *Economic Analysis and Policy* 153.
[80] Devos and Zackrisson, above n 5.
[81] See, eg, Grubert and Mutti, above n 19, 285-293. See also Sikka and Willmott, above n 19, 348; Wahab and Holland, above n 19, 346-347.
[82] Michelle Hanlon and Shane Heitzman, 'A Review of Tax Research' (2010) 50(2-3) *Journal of Accounting and Economics* 127, 129; Hope et al, above n 35, 171-172.
[83] Michelle Hanlon and Joel Slemrod, 'What Does Tax Aggressiveness Signal? Evidence from Stock Price Reactions to News about Tax Shelter Involvement' (2009) 93(1-2) *Journal of Public Economics* 126.

Adopting a broader jurisdictional and cultural analysis with respect to tax transparency and tax avoidance, Kerr[84] has concluded that transparency is an important tool for 'battling' tax avoidance, after finding those countries and firms with a greater level of transparency exhibit lower levels of tax avoidance. Given recent Australian cases involving tax avoidance, including *Commissioner of Taxation v Rowntree (No 3)*,[85] *Burton v Commissioner of Taxation*,[86] *Commissioner of Taxation v Resource Capital Fund IV LP*,[87] and *Tech Mahindra Limited v Commissioner of Taxation*,[88] and the ATO's Fraud and Corruption Control Plan 2020-21, this is particularly timely.

Devos and Zackrisson[89] also noted the importance of the tax-culture setting and the public's response to increased disclosures on legislative reform, suggesting that highly compliant nations have a greater likelihood of accepting increased disclosure, whilst those resistant may lead to further avoidance behaviour, or otherwise manipulate disclosure thresholds or engage in other avoidance schemes.[90]

Extant literature has explored the nexus between earnings management, taxation disclosure and financial reporting. Kim, Pierce and Yeung have investigated the impact of earnings management measures based on tax expense manipulation and management motivation for doing so.[91] In the US, for example, tax reporting rules differ from financial reporting rules, allowing firms to report disparate levels of income to tax authorities and to investors. Since many economic transactions are reported similarly for book and tax reporting,[92] firms often face a trade-off between cash tax savings and lower reported earnings.[93]

3.2 An overview of tone and readability

> Tone is defined ... as the affect or feeling of a communication. Distinct from promotion, which implies an intent of the speaker to influence a reader's views, a positive tone as defined here need not imply intent, although many

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[84] See generally Jon N Kerr, 'Transparency, Information Shocks, and Tax Avoidance' (2019) 36(2) *Contemporary Accounting Research* 1146.

[85] [2021] FCA 306 (concerning promoter of a tax exploitation scheme in contravention of s 290-50(1) of Sch 1 of the *Taxation Administration Act 1953* (Cth)).

[86] [2018] FCA 1857 (concerning gains from investments in the United States and consideration of Australia's foreign income tax offset provisions in Div 770 of the *Income Tax Assessment Act 1997* (Cth)).

[87] [2019] FCAFC 51 (addressing the entitlement to relief under Article 7 of the *Convention between Australia and the United States for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income*, signed 6 August 1982 (entered into force 31 October 1983)).

[88] [2016] FCAFC 130 (on the issue of allocation of taxing rights and the operation of Art. 7 (business profits rule) of the *Agreement between the Government of Australia and the Government of the Republic of India for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income*, signed 25 July 1991, [1991] ATS 49 (entered into force 30 December 1991).

[89] See generally Devos and Zackrisson, above n 5.

[90] Ibid.

[91] See Mark Kim, Spencer Pierce and Ira Yeung, 'Why Firms Announce Good News Late: Earnings Management and Financial Reporting Timeliness' (2021) 38(4) *Contemporary Accounting Research* 2691.

[92] See, eg, Frank Brunetti, *Federal Tax Accounting* (CCH Publications, 2021). The present article does not, however, discuss the rules governing US federal tax accounting which include when tax events must be taken into account for federal income tax purposes under the *Internal Revenue Code* (Title 26 of the USC).

[93] See, eg, Myron S Scholes, G Peter Wilson and Mark A Wolfson, 'Firms' Responses to Anticipated Reductions in Tax Rates: The Tax Reform Act of 1986' (1992) 30(Supp) *Journal of Accounting Research* 161, 162; David A Guenther, Edward L Maydew and Sarah E Nutter, 'Financial Reporting, Tax Costs, and Book-Tax Conformity' 23(3) *Journal of Accounting and Economics* 225; Edward L Maydew, 'Tax-Induced Earnings Management by Firms with Net Operating Losses' (1997) 35(1) *Journal of Accounting Research* 83; Steve Matsunaga, Terry Shevlin and D. Shores, 'Disqualifying Dispositions of Incentive Stock Options: Tax Benefits versus Financial Reporting Costs' (1992) 30(Supp) *Journal of Accounting Research* 37.

of the techniques for subtle promotion would create a positive tone. This study does not directly address the intent of the author but rather whether a more positive tone affects investors.[94]

Extant research examines linguistic attributes of various reports and disclosures. *Tone*, or the sentiment of the disclosures – the affect or feeling of a communication[95] – has been found to have information value;[96] influence investors' and analyst views and be associated with economic outcomes;[97] be positively associated with stock issuance[98] and firm performance;[99] and, may reflect managerial behaviour such as tax aggressiveness.[100]

Relevant to this study is the consideration of tone in voluntary reporting. Patelli and Pedrini[101] describe that in the context of press releases, information tone management occurs when the tone of press releases is either too optimistic or pessimistic in comparison to the concurrent quantitative disclosures. VTRs are similar to press releases due to their voluntary nature. Extant research shows that tone in corporate announcements impacts stock market reactions.[102] Huang, Teoh and Zhang[103] note that given managers are not required to follow explicit rules and regulations, there is wide latitude for the qualitative presentation of quantitative information. Importantly, negative tone tends to have a stronger impact that positive tone.[104]

Huang and co-authors[105] observed, within the context of press releases, that tone varies with the quantitative content and as firm performance increases optimism in tone will increase. Their research identified the abnormal component of tone (abnormal positive tone) and found evidence of strategic tone management associated with negative

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[94] Henry, above n 16, 376.
[95] Ibid.
[96] See, eg, Paul C Tetlock, 'Giving Content to Investor Sentiment: The Role of Media in the Stock Market' (2007) 62(3) *The Journal of Finance* 1139. See also Mark H Lang and Russell J Lundholm, 'Voluntary Disclosure and Equity Offerings: Reducing Information Asymmetry or Hyping the Stock?' (2000) 17(4) *Contemporary Accounting Research* 623.
[97] See, eg, Liafisu S Yekini, Tomasz P Wisniewski and Yuval Millo. 'Market Reaction to the Positiveness of Annual Report Narratives' (2016) 48(4) *The British Accounting Review* 415, 421; Xuan Huang, Siew H Teoh and Yinglei Zhang, 'Tone Management' (2014) 89(3) *The Accounting Review* 1083, 1098-1099; S P Kothari, Susan Shu and Peter D Wysocki, 'Do Managers Withhold Bad News?' 47(1) *Journal of Accounting Research* 241. See also Henry, above n 16, 378.
[98] Lang and Lundholm, above n 96, 632.
[99] See generally Angela K Davis, Weili Ge, Dawn Matsumoto and Jenny Li Zhang, 'The Effect of Manager-Specific Optimism on the Tone of Earnings Conference Calls' (2015) 20(2) *Review of Accounting Studies* 639.
[100] Kelvin K Law and Lilian F Mills, 'Taxes and Financial Constraints: Evidence from Linguistic Cues' (2015) 53(4) *Journal of Accounting Research* 777. See also Clive S Lennox and Chul W Park, 'The Informativeness of Earnings and Management's Issuance of Earnings Forecasts' (2006) 42(3) *Journal of Accounting and Economics* 439.
[101] See Patelli and Pedrini, above n 29.
[102] Tim Loughran and Bill McDonald, 'When is a Liability Not a Liability? Textual Analysis, Dictionaries, and 10-Ks' (2011) 66(1) *The Journal of Finance* 35, 43-44; Ronen Feldman, Suresh Govindaraj, Joshua Livnat and Benjamin Segal, 'Management's Tone Change, Post Earnings Announcement Drift and Accruals' (2010) 15(4) *Review of Accounting Studies* 915, 924-926. See also Henry, above n 16, 400.
[103] Huang, Teoh and Zhang, above n 97, 1099.
[104] Elaine Henry and Andrew J Leone, 'Measuring Qualitative Information in Capital Markets Research: Comparison of Alternative Methodologies to Measure Disclosure Tone' (2016) 91(1) *The Accounting Review* 153; Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 43-44; Paul Tetlock, Maytal Saar-Tsechansky and Sofus Macskassy, 'More Than Words: Quantifying Language to Measure Firms' Fundamentals' (2008) 63(3) *The Journal of Finance* 1437. See also Tetlock, above n 96.
[105] Above n 97.

earnings and cash flow performance. Similarly, Henry[106] found that tone of earnings press releases influences investors' reactions and longer releases reduced market impact. Loughran and McDonald[107] observed that diction is inappropriate for gauging the tone of financial disclosures. That study focused on Form 10-K reports revealing that frequently occurring terms that are optimistic in diction such as 'respect', 'security', 'power', and 'authority' will not be considered nor perceived positively by readers of business documents. The authors refined the general-purpose Harvard's General Inquirer word lists which Tetlock utilised,[108] and classified words in lists so that the words indeed are, from a finance perspective, positive or negative. The authors dealt with the filings' effects on stocks during the 4-days window prior and subsequent to the filing date of a 10-K.

Similar to tone, a growing body of finance and accounting research uses textual analysis to examine the *readability* of corporate reports (primarily 10-K reports), its determinants, and its consequences. Readability refers to the level of opaqueness, or obfuscation, in the information environment.[109] Complexity within the information environment reduces transparency, as 'more time and effort from outsiders to become properly informed' is required, thereby making it more difficult to understand.[110] There is little known literature on the readability of VTRs in Australia. Some studies[111] indicate that in reality average US firms provide less readable information in their 10-K reports. Others indicate that firms provide less readable corporate reports strategically to hide adverse information and to mask poor performance.[112] Lo, Ramos and Rogo[113] found that firms with more incentives to engage in earnings manipulation provide less readable narrative disclosures. Lundholm, Rogo and Zhang[114] show that foreign firms listed on the US exchanges provide more readable corporate reports, arguing that these reduce US investors' information disadvantage and reluctance to own foreign-domiciled companies' stocks. Dyer, Lang and Stice-Lawrence[115] use a global sample and document that textual attributes are associated with regulation and incentives for more transparent disclosure.

Extant research examining the consequences of corporate reports' readability identifies that readability is positively associated with the earnings persistence,[116] analyst coverage, accuracy of forecasts,[117] credit rating,[118] stock liquidity and trading

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[106] See Henry, above n 16, 396.
[107] Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 42-43.
[108] Tetlock, above n 96.
[109] Li, above n 15. See also Clarisa Sukotjo and Yanuar Nanok Soenarno, 'Tax Aggressiveness, Accounting Fraud, and Annual Report Readability' (2018) 6(2) *Journal of Finance and Economics* 38, 39.
[110] See Beuselinck et al, above n 14, 4.
[111] See, eg, Samuel B Bonsall IV, Andrew J Leone Brian P Miller and Kristina Rennekamp, 'A Plain English Measure of Financial Reporting Readability' (2017) 63(2-3) *Journal of Accounting and Economics* 329. See also Li, above n 15, 232-233.
[112] See Li, above n 15, 233.
[113] Kin Lo, Felipe Ramos Rafael Rogo, 'Earnings Management and Annual Report Readability' (2017) 63(1) *Journal of Accounting and Economics* 1.
[114] Russell J Lundholm, Rafael Rogo and Jenny Li Zhang, 'Restoring the Tower of Babel: How Foreign Firms Communicate with US Investors' (2014) 89(4) *Accounting Review* 1453.
[115] Travis Dyer, Mark Lang and Lorien Stice-Lawrence, 'Do Managers Really Guide Through the Fog? On the Challenges in Assessing the Causes of Voluntary Disclosure' (2016) 62(2-3) *Journal of Accounting and Economics* 270.
[116] See Li, above n 15, 232-234.
[117] Reuven Lehavy, Feng Li and Kenneth Merkley, 'The Effect of Annual Report Readability on Analyst Following and the Properties of Their Earnings Forecasts' (2011) 86(3) *The Accounting Review* 1087.
[118] See Bonsall et al, above n 111.

volume,[119] and investment efficiency,[120] while it is negatively associated with the cost of debt and the stock price crash risk.[121] Loughran and McDonald[122] demonstrate that lower readability is a reflection of a poor corporate information environment and is related to earnings volatility and more dispersed analyst forecasts. These studies provide useful insights into the implications of corporate reports' readability for capital market participants.

3.3 Attention and tax planning

Due to the reliance on financial statements to obtain tax-related information, there are numerous studies which consider readability and tax aggressiveness. Beuselinck and co-authors[123] most recently found within the US context between 1994 and 2014 that firms adopting aggressive tax planning strategies[124] have less readable[125] financial statements, strongly suggesting that they are attempting to confuse the audience regarding their underlying tax risk. The introduction of Schedule M-3,[126] however, led to a weakening of this association. From these results they concluded that when the benefits to obfuscation decline, reliance on obfuscation declines:

> … This evidence suggests that managers apply complex financial reporting strategies when the benefits of hiding tax aggressive policies exceed the costs, but rely less on obfuscation through such complexity when the benefits of obfuscation attempts are small.[127]

Similarly, Inger and co-authors[128] considered the trade-off of decision-useful information disclosure for stakeholders and concealment from the tax authority. They found that those firms engaging in higher levels of tax avoidance disclosed less readable tax footnotes (consistent with managers concealing), whilst those engaging in low levels disclosed more readable tax notes. The caveat of such studies is that complexity can arise through the natural consequence of business complexity and temporality. Both Beuselinck and co-authors[129] and Balakrishnan, Blouin and Guay[130] have highlighted the complexity in such studies, looking beyond tax footnotes as well as providing justification for negating firm complexity as having a confounding effect. They note that tax planning can increase the financial complexity of an organisation and annual report complexity can be a natural consequence of business complexity. Balakrishnan

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[119] Gus De Franco, S P Kothari and Rodrigo S Verdi, 'The Benefits of Financial Statement Comparability' (2011) 49(4) *Journal of Accounting Research* 895; Dyer et al, above n 115.
[120] Gary C Biddle, Gilles Hilary and Rodrigo S Verdi, 'How Does Financial Reporting Quality Relate to Investment Efficiency?' (2009) 48(2-3) *Journal of Accounting and Economics* 112.
[121] Mine Ertugrul, Jin Lei, Jiaping Qiu and Chi Wan, 'Annual Report Readability, Tone Ambiguity, and the Cost of Borrowing' (2017) 52(2) *Journal of Financial and Quantitative Analysis* 811.
[122] Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 43-44.
[123] Beuselinck et al, above n 14.
[124] Ibid (the authors used three measures of tax aggressiveness: incremental tax savings, number of tax haven countries and tax litigation).
[125] Ibid (the authors used the Bog Index, Gunning-Fog Index, 10-K file size and length of the SEC 10-K report to assess readability).
[126] Ibid (outlining the detailed reconciliation of book income to tax income required by the Internal Revenue Service (IRS)).
[127] Ibid.
[128] Kerry K Inger, Michele D Meckfessel, Mi (Jamie) Zhou and Weiguo (Patrick) Fan, 'An Examination of the Impact of Tax Avoidance on the Readability of Tax Footnotes' (2018) 40(1) *Journal of the American Taxation Association* 1.
[129] Beuselinck et al, above n 14.
[130] Karthik Balakrishnan, Jennifer L Blouin and Wayne R Guay, 'Tax Aggressiveness and Corporate Transparency' (2019) 94(1) *The Accounting Review* 45.

and co-authors[131] found that aggressive tax planning is associated with lower corporate transparency. As such, it can be challenging to be sure that complexity is intentionally applied to confuse.

Importantly, an additional analysis undertaken by Beuselinck and co-authors[132] was to consider the increase in IRS attention[133] and whether this affected the tax aggressiveness[134] of firms. In order to assess this, they considered the change in readability and the change in IRS attention, segregated into tax aggressive and non-tax aggressive firms. The analysis found that IRS attention resulted in more readable financial statements for tax aggressive firms. Beuselinck and co-authors identified as a potential explanation that 'obfuscation through complexity becomes less helpful'[135] after authorities start initial screening, with firms therefore making their financial reports more transparent. Similarly, the findings by Hope and co-authors[136] supported the notion that non-disclosure of geographic earnings helped to mask tax avoidance behaviour, and this was impacted by the implementation of Schedule M-3 which reduced the ability to conceal such behaviour.

As such, public disclosure has an impact on obfuscation activities of entities, evidenced by firms undertaking aggressive tax avoidance behaviours. However, rather than focusing on aggressiveness itself, this study focuses on the interplay between public exposure via government intervention (comparable to the consideration of IRS attention in Beuselinck and co-authors[137]) and the evolution of voluntary tax reporting.

3.4 Complexity, scrutiny and voluntary disclosure

> …Although economic theory predicts managers use voluntary disclosure to alleviate the information problems associated with complex financial statements, the theory provides little guidance on the context or medium of the voluntary disclosure.[138]

Concern has been raised over the effectiveness of financial statement disclosures, due to the growing complexity of accounting rules and explanatory language leading to investors failing to internalise complex financial statements.[139] Guay, Samuels and Taylor[140] considered the relationship between financial statement complexity and voluntary disclosure.[141] They noted that the relationship depends on how the complexity arises, whether through choice by managers,[142] or by firms' business

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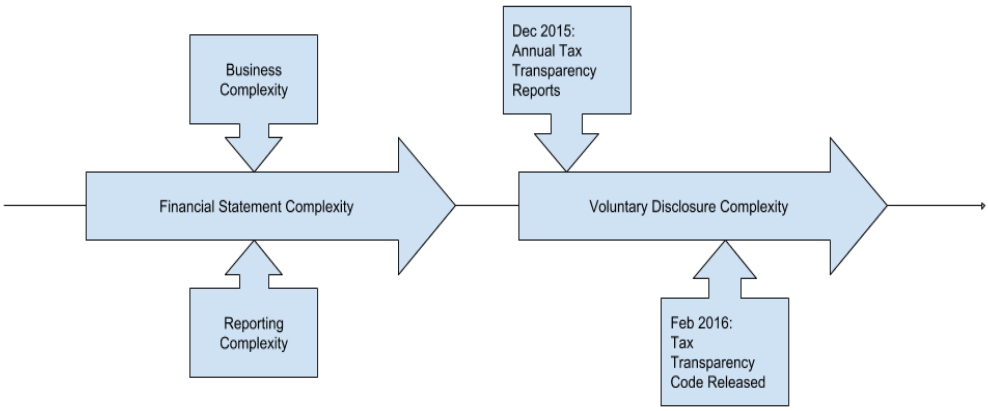
[131] Ibid 52.
[132] Beuselinck et al, above n 14.
[133] Where the IRS attention is the number of times the IRS download the SEC 10-K in a year: ibid.
[134] Tax aggressive firms were identified as firms that: belong to the bottom quintile of industry-year-adjusted cash ETRs, report above industry-year mean values for Tax Haven, and are under consideration of potential tax malfeasance (TaxLitigation = 1). Ibid.
[135] Ibid 23.
[136] See generally Hope et al, above n 35, 179-180.
[137] Beuselinck et al, above n 14.
[138] Wayne Guay, Delphine Samuels and Daniel Taylor, 'Guiding Through the Fog: Financial Statement Complexity and Voluntary Disclosure' (2016) 62(2-3) *Journal of Accounting and Economics* 234, 237.
[139] See Li, above n 15, 232-233.
[140] Guay et al, above n 138, 234-235.
[141] Ibid, Table 2, Panels A and B.
[142] In this instance, the complexity of financial statements reflects an information-based agency problem, namely that managers seek to obfuscate poor performance. If intentional, they are unlikely to use alternative disclosure channels to increase information environment quality. See also Guay et al, above n 138, 235, noting that there will be a negative-no relationship between financial statement complexity and voluntary disclosure.

transactions and reporting standards.[143] For example, Hope and co-authors[144] suggested that to the extent managers would believe that non-disclosure of geographic earnings reduces probability of audit, prevents additional foreign sanctions or penalties or deflects public criticism, voluntary disclosures would be avoided. This was, nonetheless, mitigated when a certain level of disclosure became mandated. Dyer, Lang and Stice-Lawrence (2016),[145] however, have raised concern over the ability to *convincingly separate* the disclosure choices from the underlying economics.

With this in mind, Guay and co-authors highlight the other disclosure mediums beyond the financial statements that can 'achieve an optimal information environment'.[146] In particular, a number of studies consider the interplay between mandatory and voluntary disclosures, finding that the complexity (reflecting lower information accessibility) is associated with increased voluntary disclosure, which is consistent with mandatory and voluntary disclosure serving as substitutes.[147]

Rather than focusing on the complexity of financial statements leading to voluntary disclosures, in this study the focus is on the voluntary disclosures themselves and their tone and readability. The driver of voluntary disclosure is arguably linked to something other than financial statement complexity and disclosure choices: government intervention followed by the rise of voluntary tax disclosures, as set out in Figure 1.[148]

Fig. 1: Voluntary Disclosure Complexity



Source: authors, extending Guay et al, above n 138, 237.

[143] In this instance, complexity of financial statements reflects complexity of a firm's business transactions, GAAP/IFRS reporting and disclosure rules: complexity necessitates complexity. Guay et al suggest that in applying economic theory, managers will voluntarily disclose supplemental information to mitigate negative effects of complex financial statements. Thus, a positive relationship between financial statement complexity and voluntary disclosure will be found. See further Guay et al, above n 138, 235.
[144] Hope et al, above n 35, 178-179.
[145] Dyer et al, above n 115, 273.
[146] Guay et al, above n 138, 253. They found a positive relationship between financial statement complexity and voluntary disclosure, with the strongest (weakest) relationship being found when managers have greater (lesser) incentives to mitigate the informational problems caused by complex financial statements.
[147] Jennifer Francis, Dhananjay Nanda and Per Olsson, 'Voluntary Disclosure, Earnings Quality, and Cost of Capital' (2008) 46(1) *Journal of Accounting Research* 53, 62-63; Guojin Gong, Laura Yue Li and Hong Xie, 'The Association between Management Earnings Forecast Errors and Accruals' (2009) 84(2) *The Accounting Review* 497.
[148] Lennox and Park, above n 100 (who find a positive relationship between earnings quality and the incidence, frequency and accuracy of voluntary disclosure).

We posit that the greater the absence of tax information generally available, the greater the degree of complexity for the voluntary disclosures. Beyond the limited tax disclosures, there is opportunity to obfuscate due to the lack of alignment between tax and accounting, and the latitude in voluntary reporting.

For the relevant Australian context, prior to the introduction of the TTC and VTRs, the introduction of the *Tax Laws Amendment (2013 Measures No 2) Act 2013* led to annual tax transparency reports (MTRs) being published. Before its enactment, mixed support was provided for this approach towards improving the transparency of the business tax system.[149] In particular, public submissions raised concern over the possibility of disclosures leading to confusion, misunderstanding and misinterpretation and costs to reputation, requiring further costs and disclosures.[150] Hoopes, Robinson and Slemrod[151] have found that following the release of the tax transparency reports, publicly available articles and social media sources have similarly led to negative media attention through which investors reacted negatively to anticipated and actual tax disclosures. The above research indicates that the creation of tax transparency reports can lead to negative investor reactions. Numerous other studies have also explored tax scrutiny and the information environment.[152]

Extant literature suggests that from the firm perspective, public scrutiny results in few consequences,[153] and that investor consequences are short-lived.[154] This seems to suggest, on the one hand, that stakeholder value is perceived by firms to be a lower priority due to being short-lived and therefore not a primary incentive to disclose tax information other than what is mandated. In the alternative, those firms seeking to raise capital through the issuance of shares or bonds may have an incentive to make additional tax disclosures other than what is mandated under statute in order to incentivise investor stakeholders. Irrespective of this, political tax exposure has previously been linked with shifting income tax reporting approaches in Australia during the 1970s when the government was advocating the removal of significant tax concessions.[155] In particular, companies considered to be *politically exposed* – categorised as large with low ETRs – utilised the adoption of inter-period tax allocation that resulted in an increase to their ETRs and as such reduced that political exposure.[156]

Similar evidence has been found more recently in the UK, where Dyreng, Hoopes and Wilde[157] have found public scrutiny led to a change in disclosure and tax avoidance behaviour, resulting in the reported income tax expense increasing. Importantly, Dyreng and co-authors note that there is a trade-off between such tax avoiding behaviour and the ultimate political, reputational and proprietary costs.[158] This can be

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[149] Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22.
[150] Ibid.
[151] Jeffrey L Hoopes, Leslie Robinson and Joel Slemrod, 'Public Tax-Return Disclosure' (2018) 66(1) *Journal of Accounting and Economics* 142, 143.
[152] Shannon Chen, 'Do Investors Value Corporate Tax Return Information? Evidence from Australia' (PhD Dissertation, The University of Texas at Austin, 2017); Scott D Dyreng, Jeffrey L Hoopes and Jaron H Wilde, 'Public Pressure and Corporate Tax Behavior' (2016) 54(1) *Journal of Accounting Research* 147, 151. See also Hoopes et al, above n 151; Sidhu and Whittred, above n 32, 78-79.
[153] John Gallemore, Edward L Maydew and Jacob R Thornock, 'The Reputational Costs of Tax Avoidance' (2014) 31(4) *Contemporary Accounting Research* 1103.
[154] Hanlon and Slemrod, above n 83.
[155] Sidhu and Whittred, above n 32, 79.
[156] Ibid.
[157] Dyreng et al, above n 152, 152.
[158] Ibid 153.

linked to the work by Graham and co-authors,[159] which found reputation to be the second most important factor in the decision not to adopt a potential tax planning strategy. This, it is observed, impacts the degree to which VTR is used as a tool for reputation control. This suggests that firms may be less likely to disclose tax information other than what is mandated for fear of reputational damage to the firm. Moreover, top management was considered to care at least as much about the GAAP ETR as cash taxes paid for the substantial majority of executives (84 per cent).

Returning to Hoopes and co-authors,[160] who also examined the mandatory tax transparency reports in Australia, their study found evidence of firms adjusting their income to avoid disclosure,[161] thus anticipating the cost of disclosure. Similarly, the study by Chen[162] indicates that although investors anticipated an overall net benefit from the disclosure arising from the mandated tax transparency reports (including the benefit from reduced information asymmetry and monitoring of activities), firms likely to face increased scrutiny were found to have small negative market reactions. Comparable findings have also been established in Japan, where a non-trivial number of taxpayers who were otherwise close to the threshold under-reported to avoid disclosure.[163]

As such, the literature suggests that scrutiny and public exposure are linked to impacts in terms of disclosure approaches and mixed concern over increased scrutiny. The focus of the present study is to consider the latitude available in the preparation of VTRs and the opportunity to strategically obfuscate what is a new disclosure regime or set the tone to do so. Although Chen[164] suggests an overall positive impact for investors, companies which are publicly exposed – due to the increased avenues for scrutiny but also being particularly exposed due to their respective level of tax payable – have particular impetus to utilise tone and readability to protect their reputation. Unlike Chen[165] as well as Devos and Zackrisson,[166] however, who explore aggressiveness, the current study explores the level of attention combined with the public exposure in line with Sidhu and Whittred.[167]

4. RESEARCH QUESTION AND HYPOTHESIS

This study examines whether those who face the prospect of public notoriety, comprising having low comparative tax payable as per the mandated tax transparency report (*public exposure – scrutinised*), as compared to those that are not (higher comparative tax payable as per the mandated tax transparency report, *public-exposure – low scrutiny*) will make decisions leading to differences in readability and tone. Therefore, the following research question is proposed: *does the level of public exposure (scrutinised/low scrutiny) arising from mandatory tax reporting impact readability and tone of voluntary tax reporting?*

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[159] John R Graham, Michelle Hanlon, Terry J Shevlin and Nemit Shroff, 'Incentives for Tax Planning and Avoidance: Evidence from the Field' (2014) 89(3) *The Accounting Review* 991, 999-1000.
[160] See Hoopes et al, above n 151, 150.
[161] Relating to the distribution of reported income around the threshold, revealing an increased frequency of income just below the threshold. See ibid 143.
[162] See generally Chen, above n 152.
[163] See generally Hasegawa et al, above n 6.
[164] Chen, above n 152.
[165] Ibid 143.
[166] Devos and Zackrisson, above n 5.
[167] See generally Sidhu and Whittred, above n 32.

Scrutiny becomes more directly linked to the level of tax disclosed in the mandated tax transparency report. Similarly, Devos and Zackrisson[168] describe the situation where the mandatory tax disclosure regime can lead to public perception issues:

> The implications of the new disclosure legislation will vary for Australian listed entities, privately held large businesses and Australian subsidiaries of foreign owned multi-national groups. It will also depend on the cash tax profiles of the large businesses. From a deterrent perspective, public perception issues may arise from the disclosures. For example, if businesses have low cash tax payable due to factors such as carry-forward losses or R&D deductions, increased queries may arise in the absence of full information, from analysts, the public or social welfare groups. Another danger for business is that mandatory disclosure of tax information may adversely affect consumers' buying behaviour (similar to the recent protests directed at Starbucks in Britain). In addition, governments themselves are large consumers of goods and services and may take information on tax contribution into account when making purchasing decisions. There have also been reports about 'ethical investors' who ignore purchasing shares in companies that are not viewed as tax compliant.

The first issue raised is of most relevance here: where the mandatory tax reports reveal certain entities to have low cash tax payable, there is a potential for increasing queries.[169] These variations do not have to represent tax aggressive sources; there can be genuine reasons for a low tax payable rate. As such, we argue that this study does not need to extend the analysis to consider tax aggressiveness of the firms, as unlike in Beuselinck and co-authors[170] this study is considering *the public perception* response.

Alternatively, due to the disclosure of certain tax information via the tax transparency reports, there is a contrasting argument that to the extent there are benefits to obfuscate engagement in (aggressive) tax planning activities, whilst increasing pressure to explain tax transparency disclosures arising through the mandated tax transparency reports, firms may decrease readability of the VTRs. This is comparable to Sidhu and Whittred,[171] who considered the impact of perceptions at a time where the government was proposing to remove tax concessions. This could be linked to what Ballas has described as an instrument of social control or management: ie, control over the narrative.[172] Yet Beuselinck and co-authors[173] and Hope and co-authors[174] reveal government attention to be linked to improvements in readability.

We posit three key opportunities that entities have to obfuscate through readability. First, within the larger context, there is a general lack of available tax information. The MTRs provide limited amounts of information to the general public. Second, this opportunity gives rise to further latitude, due to the lack of alignment between the accounting and taxation systems. This leads to a disconnectedness in the potential content of the MTRs, which offer little information and context to close the lacunae of

[168] Devos and Zackrisson, above n 5, 118-199 (citations omitted).
[169] Ibid.
[170] See generally Beuselinck et al, above n 14.
[171] Sidhu and Whittred, above n 32.
[172] Ballas, above n 31, 733. See also Jameson, above n 31, 9; Li, above n 15.
[173] Beuselinck et al, above n 14.
[174] Hope et al, above n 35, 181-182.

tax information. This is comparable to the argument posed by Beuselinck and co-authors:[175]

> To the extent that non-discovery of aggressive tax planning activities is a considerable benefit, we conjecture that more tax aggressive firms will use more financial reporting obfuscation strategies through overly complex financial reporting.

However, it does not need to be only for the purpose of tax aggressiveness, as seen in the study by Beuselinck and co-authors; it can also be for the purpose of controlling the narrative.[176] The third opportunity allowing for the control of the narrative is the latitude within voluntary disclosures generally.[177]

Following the logic of Guay and co-authors[178] and Morton,[179] complexity in VTRs arises from the lack of alignment between tax and accounting disclosures, the complexity of a firm's business transactions and lack of knowledge with regards to external reporting and disclosure rules. In this sense, *complexity necessitates complexity*, and *publicly-exposed* firms will seek to obfuscate tax activities. In both cases reducing (perceived) information uncertainty mitigates the negative effects of misaligned (revealed) disclosure. Based on the literature discussed, it is anticipated that the VTRs are used as a tool to manage the narrative and therefore the following hypotheses are derived:

- H_1: Companies with *public exposure – low scrutiny* prepare voluntary tax reports which are easier to read; and
- H_2: Companies with *public exposure – scrutinised* prepare more optimistic voluntary tax reports.

However, despite the attempts for companies to control the narrative through obfuscation,[180] following Beuselinck and co-authors[181] and Hope and co-authors,[182] government attention may lead to improvements in readability.

The focus, therefore, relates to whether and how tone and readability are being used as a tool for managing audience perceptions to blur the transparent nature of what is purported to be an aid towards transparency of corporate tax affairs, given the voluntary nature of the disclosures and the potential pressure to respond to mandated tax disclosures arising from the annual tax transparency reports. We argue that the extent to which VTRs are used as such a tool is dependent on the level of public inquiry the entity is likely to face, which is directly related to the level of tax payable (*public exposure – scrutinised*; *public exposure – low scrutiny*). Unlike the study by Guay and co-authors,[183] this article does not assess financial statement complexity: see Figure 1. With this in mind, the article investigates the tone and readability of VTRs of signatories to the TTC.

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[175] Beuselinck et al, above n 14, 4.
[176] Ibid.
[177] Huang et al, above n 97.
[178] Guay et al, above n 138, 255.
[179] Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22, 19-21.
[180] See, eg, Jameson, above n 31, 9 and generally Li, above n 15.
[181] Beuselinck et al, above n 14, 4.
[182] See generally Hope et al, above n 35.
[183] Guay et al, above n 138, 256.

5. RESEARCH DESIGN

This article examines the association of MTRs with tone and readability of VTRs in Australia. The authors rely on linear regression on secondary data to conduct an empirical study of the association of mandatory tax disclosures on the readability and tone of voluntary tax reports. The following sections outline the process of data collection from the signatories of the TTC; and a description of the sample data, key variables (ETR, tone and readability), before outlining the regression models.

5.1 Population and data collection

The ATO is the 'responsible agent' that provides a link to issued TTC reports via a central website.[184] VTRs were obtained from this central website on 3 July 2018 (the database being last updated on 29 June 2018). According to the database, of the 137 signatories as at that date, 113 entities had published a VTR (82.5 per cent). On examination and screening however, inconsistencies and inaccuracies were noted in the database. This likely arose due to the onus being on the entity to update the ATO regarding when the reports are published (as well as more generally when the URL links to the VTRs change which is not reported to the ATO).

These discrepancies include: whether or not the URL provided was accurate in sending the user to the report and/or whether it was invalid; inconsistency between specified years; and, whether or not certain year reports were available or produced. Many did not have reports available for the set years, whilst others were available for differing years specified. Each listing on the database was reviewed and the VTR document was obtained, where available. In several instances, the entity website had to be reviewed to obtain the VTR. In three instances, however, no report was able to be located.

As such, the population of entities was reduced from 113 to 110. Furthermore, due to the specified income years not being consistent, these were also reviewed and updated to be consistent across all VTRs. In one instance, it could not be determined what the year-end period was, only the year generally in question.

Across those 110 entities, 150 VTRs were identified spanning the years ending 31 December 2014 through to 31 March 2018. VTR formats from disclosures generally span from being located within the CSR/Sustainability reports (CSR), Corporate Governance reports (CG), Annual Reports (AR), or as standalone tax reports (TR). However, this number warrants further consideration:

- Two signatories were revealed to be related with duplicate VTRs disclosed. The duplicate listing was removed.
- In a number of instances, the VTR disclosures were dispersed across multiple reports. In one instance, that dispersion included a website. The website entry was removed.
- In two instances the single VTR related to two years. The VTR relating to both years was removed.

The sample size thus comprised 107 entities and 147 VTRs. The database also provides basic information in addition to entity name, year and URL. These variables include

[184] See generally Australian Government, 'Voluntary Tax Transparency Code: VTTC Reports' (31 May 2021), https://data.gov.au/dataset/voluntary-tax-transparency-code.

the *Size* (large, medium); *Origin – Ultimate Parent Company* (Australia, Australia & Foreign dual listed, Foreign); and, *Disclosure* (Part A & B, Part A & Partially B, Part A). Most entities listed were large, having an Australian ultimate parent company, and were recorded as having disclosed Part A & B in their VTR. However, for one entity, these additional variables were blank. The 147 VTRs are categorised in Appendix Table A2, across three panels.

Acknowledging that: (i) there is a high concentration of 'TR' reports and 'large' companies disclosing 'Part A & B'; and (ii) there are integral differences among each company's average total income and taxable income and tax payable, the analysis focuses on the specific group of 106 observations of 'TR' reports issued by 'large' companies which disclose 'Part A & B'.

In addition to the aforementioned VTRs, the tax transparency reports were examined to determine and obtain the mandated tax disclosures spanning the similar time frame (2013-14, 2014-15, 2015-16, 2016-17 report data). In most instances, those companies producing VTRs were also present in the tax transparency reports. From the entities reporting VTRs, four were found not to have any immediate listing in the mandated tax transparency report, with three observations specific to the group of 'TR' reports issued by 'large' companies which disclose 'Part A & B'. However, there is some complexity here in matching the entities due to the differing concepts of consolidation under accounting rules compared to taxation rules. Simply put, these entities could be represented by a differing entity not clearly identifiable. In some instances, there is not an exact match of the name listed on the VTR registry to the tax transparency report.[185] This again can stem from the differing consolidation methodology between the two systems. For example, it could be a group listed on the VTR registry, whilst the tax consolidated group head entity is listed on the tax transparency report. Or otherwise, it appears that the full name is not detailed on the VTR registry. The details regarding the companies belonging to the sample are shown in Appendix Table A3, and described further below.

The Effective Tax Rate (ETR) is calculated by dividing variable Tax Payable by variable Taxable Income from the MTR. While this provides consistency, the authors recognise that there is a lack of consensus around the formulation of the ETR calculation.[186] However, the method is premised by virtue of the data source: the article's focus is on the extent to which VTRs reflect levels of public perception of the disclosures within the MTR, and therefore the ETR is obtained from the MTR,[187] where disclosures are limited to total income, tax payable and taxable income. The ETR has an average of 17.63 per cent and a median of 23 per cent with the distribution outlined in Table 2.

[185] See section 4 of this article, above. See further Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22 (considering the limitations of MTR disclosures).
[186] See, eg, Thomas Belz, Dominik von Hagen and Christian Steffens, 'Taxes and Firm Size: Political Cost or Political Power?' (2019) 42 *Journal of Accounting Literature* 1.
[187] This is in place of VTR or annual reports: ibid. Also note that the MTR does not report to any extent the magnitude of tax *refunds*, instead reports these as nil ($0), discussed in Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22. So, all instances result in positive ETRs.

Table 2: Effective Tax Rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0%	26	24.5	25.2	25.2
	2%	1	.9	1.0	26.2
	4%	1	.9	1.0	27.2
	5%	1	.9	1.0	28.2
	8%	1	.9	1.0	29.1
	9%	1	.9	1.0	30.1
	10%	3	2.8	2.9	33.0
	11%	1	.9	1.0	34.0
	14%	1	.9	1.0	35.0
	16%	2	1.9	1.9	36.9
	17%	1	.9	1.0	37.9
	18%	2	1.9	1.9	39.8
	19%	3	2.8	2.9	42.7
	20%	1	.9	1.0	43.7
	21%	2	1.9	1.9	45.6
	22%	1	.9	1.0	46.6
	23%	5	4.7	4.9	51.5
	24%	6	5.7	5.8	57.3
	25%	3	2.8	2.9	60.2
	26%	6	5.7	5.8	66.0
	27%	4	3.8	3.9	69.9
	28%	3	2.8	2.9	72.8
	29%	15	14.2	14.6	87.4
	30%	13	12.3	12.6	100.0
	Total	103	97.2	100.0	
Missing	System	3	2.8		
Total		106	100.0		

The software JFreq[188] was used to peruse the reports, count the number of words in each annual report, and determine the frequency of each word in the annual report. Word frequency is calculated by dividing the total number of words belonging to a specific word list by the total number of words in the annual report. For the main analysis, word frequency is calculated using the equal weighting method, following prior accounting and finance research.[189] This means that the same weight is applied to each word occurring in the word lists.

The tone refers to the extent to which reports contain words with optimistic or pessimistic sentiment. Bicudo de Castro and co-authors[190] examined 5,034 firm-year

[188] Will Lowe, 'JFreq: Count Words, Quickly', Java Software Version 0.5.4 (2011). See also Will Lowe, Kenneth Benoit, Slava Mikhaylov and Michael Laver, 'Scaling policy preferences from Coded Political Texts' (2011) 36(1) *Legislative Studies Quarterly* 123.
[189] Henry and Leone, above n 104, 172.
[190] Vicente Bicudo de Castro, Ferdinand A Gul, Mohammad Badrul Muttakin and Dessalegn Getie Mihret, 'Optimistic Tone and Audit Fees: Some Australian Evidence' (2019) 23(2) *International Journal of Auditing* 352.

observations drawn from annual reports of non-financial firms listed on the Australian Stock Exchange (ASX) for the period from 2002 to 2014 and provided the top words from the positive and negative word lists in the Australian context in Loughran and McDonald.[191] The words 'Loss', 'Losses', 'Impairment', 'Against' and 'Disclosed' represent the five most frequently used negative words in Australian annual reports and 37.55 per cent of the total frequency of negative words used; the top five most frequently used positive words in Australian annual reports were 'Effective', 'Benefit', 'Strong', 'Outstanding' and 'Gains', representing 22.25 per cent of the total frequency of positive words used. As word frequency is calculated by dividing the total number of words belonging to a specific word list by the total number of words in the document, tone is, therefore, measured as the frequency of positive words minus the frequency of negative words used in a report.[192] Such a measure captures the net use of words characterising the tone between optimistic (ie, a higher net value) and pessimistic (ie, a lower net value). Hence, tone is set as the difference between the number of positive words and negative words recorded in the report, scaled by the total words recorded in the report. The word list in Loughran and McDonald[193] is used for classifying words between positive and negative words. The mean tone of the reports in the selected sample is 0.006, which is slightly more optimistic than the −0.002 recorded on Australian annual reports[194] and the −0.006 recorded on US annual reports.[195]

For this study, the article utilises the readability indexes of Fog and Flesch-Kincaid as proxies for the practice of obfuscation in reports (eg, Bayerlein and Davidson[196]). The Fog or Flesch-Kincaid are readability indexes, and the higher these indexes, the harder a document is to read thus reducing the effectiveness of the information available to stakeholders. The correlations between the variables are shown in Table 3.

[191] See Table 2 in Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 46.
[192] See generally Feng Li, 'Managers' Self-Serving Attribution Bias and Corporate Financial Policies' (Working Paper, Shanghai Advanced Institute of Finance, Shanghai Jiaotong University, July 2010). See also Castro et al, above n 190.
[193] Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 43-44.
[194] Castro et al, above n 190, 358.
[195] Loughran and McDonald, 'When is a Liability Not a Liability?', above n 102, 46.
[196] See generally Bayerlein and Davidson, above n 15.

Table 3: Correlations

Variable	Ln(JFreq Words)	Fog	Flesch-Kincaid	Tone	Ln(Total Income $)	Ln(Taxable Income $)	Ln(Tax Payable $)	Ln(Market Capitalisation)	Effective Tax Rate
Ln(JFreq Words)	1	-.198*	-.196*	-.193*	.434**	.067	.058	.332**	-.058
Fog	-.198*	1	.982**	-.162	.050	-.044	-.228*	.020	-.246*
Flesch-Kincaid	-.196*	.982**	1	-.211*	.084	-.053	-.230*	.046	-.252*
Tone	-.193*	-.162	-.211*	1	-.072	.349**	.287**	.091	.355**
Ln(Total Income $)	.434**	.050	.084	-.072	1	.333**	.231*	.609**	.083
Ln(Taxable Income $)	.067	-.044	-.053	.349**	.333**	1	.710**	.296*	.584**
Ln(Tax Payable $)	.058	-.228*	-.230*	.287**	.231*	.710**	1	.185	.867**
Ln(Market Capitalisation)	.332**	.020	.046	.091	.609**	.296*	.185	1	.120
Effective Tax Rate	-.058	-.246*	-.252*	.355**	.083	.584**	.867**	.120	1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

5.2 Method of analysis

The authors argue that ETR is an independent variable and tone and readability are dependent variables on the basis that the tone and readability of a report will change depending on a high or low ETR. Unlike Sidhu and Whittred,[197] who utilised a probit variable, this study utilises a linear regression model using the continuous variable of ETR; note that tone and readability (Fog and Flesch-Kincaid indexes) are continuous variables as well. The authors propose the following models:

Model 1:

$$Fog = \beta_0 + \beta_1 ETR + \beta_2 Ln(Market\ Capitalisation) + \beta_3 Ln(JFreq\ Words) + \varepsilon$$

Model 2:

$$Flesch\text{-}Kincaid = \beta_0 + \beta_1 ETR + \beta_2 Ln(Market\ Capitalisation) + \beta_3 Ln(JFreq\ Words) + \varepsilon$$

Model 3:

$$Tone = \beta_0 + \beta_1 ETR + \beta_2 Ln(Market\ Capitalisation) + \beta_3 Ln(JFreq\ Words) + \varepsilon$$

Given that the article's focus is on the extent to which VTRs reflect levels of public perception of the disclosures within the MTR, the ETR is obtained from the mandatory tax reports rather than the voluntary tax reports or annual reports. The MTRs reflect the particular government intervention of interest that is directed at public education, therefore as already outlined, is our variable of interest. The authors add as control variables to the model variables which represent size of our observations. The Ln(Market Capitalisation) is used as a proxy for size of the corporations and the Ln(JFreq Words) is used for capturing the length of the VTR.

Similar to Sidhu and Whittred,[198] the authors argue that the public exposure via the government's mandatory tax transparency regime (and other measures) as a result of

[197] Sidhu and Whittred, above n 32.
[198] Ibid.

increased scrutiny and public pressure over large corporations in Australia, has led particular companies to respond by producing voluntary tax reports that encompass particular tone and readability characteristics.

In line with Sidhu and Whittred,[199] the authors split the sample using what that study described as a 'politically acceptable threshold', perhaps here better described as a *publicly acceptable threshold*. The authors rank the companies based on their ETR, an approach consistent with information sourced from respective mandatory tax transparency reports, and then have defined publicly exposed companies as those with an ETR less than the median. Those below the median are categorised as *public exposure – scrutinised*, whilst those that have a higher ETR are categorised as *public exposure – low scrutiny*. Arguably, this could be seen as an arbitrary threshold as it results in half of the sample being politically exposed and the other half not.

An examination of the correlation between the variables shows no high correlation among the variables used in each of the proposed models, suggesting no issues with variables' discriminant validity.[200] A note should be made regarding the Fog and Flesch-Kincaid indexes, both being used as proxies for readability and therefore displaying a high correlation. Using two different proxies for measuring readability – with similar findings – improves the reliability of the model when examining the readability. Regarding the validity of the models, the analyses show the coefficients of the independent and control variables adopted in the models are not always statistically significant. Therefore, the regressions present low f-values and low adjusted R^2. Overall, an analysis of the correlations between the sub-samples' dependent and independent variables will suffice for reaching the findings of this study.

6. DISCUSSION AND ANALYSIS OF THE FINDINGS

6.1 Preliminary findings

The preliminary findings examined the relationship between all 106 observations and revealed (see correlation matrix on Table 3) that:

- There is a positive correlation of 0.355 (significant at the 0.01 level) between tone and ETR, meaning that a positive tone is associated with higher ETR, and
- There are negative correlations of -0.246 and -0.252 (both significant at the 0.05 level) between Fog and Flesch-Kincaid indexes and ETR, meaning that reports easier to read are associated with higher ETR.

Regression analysis using tone as an independent variable confirms that a high ETR is associated with reports with a more positive tone. The coefficient for the ETR is 0.414 (t=4.005) (see Table A4). In particular, as ETR increases – increasingly contributing to what can be described as perceptions of their 'fair share' of tax – the tone of reports becomes more positive. The company is positive towards its tax disclosures, so from the perspective of Treasurer Joe Hockey's request in 2015, the company may feel it is

[199] Ibid.
[200] See generally John Hulland, 'Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies' (1999) 20(2) *Strategic Management Journal* 195.

helping to educate the public about its compliance with the tax laws.[201] The company's tone is positive towards the 'informed public scrutiny'[202] and towards its reputation.[203]

Regression analysis using readability indexes as independent variables and as dependent variables ETR, Ln(Market Capitalisation) and Ln(JFreq Words) (Models 1, 2, and 3) confirms that a high ETR is associated with reports that are easier to read (ie, low readability indexes). The coefficients for the ETR are -0.246 (t=2.136), using Fog as an independent variable and -0.251 (t=-2.186), using Flesch-Kincaid as an independent variable.

With these findings in mind, the higher the ETR, the more transparent and user friendly the report – being the aim of the TTC and outlined by the Board of Taxation.[204] The clearer the disclosures, the more easily understood the content. These results align broadly to extant research on scrutiny and public exposure being linked to tone and readability.[205] However, this raise questions as to whether the voluntary scheme is having the effect of incentivising companies towards the spirit of the law, as the Senate Economics References Committee enquiry discussed.[206] This is particularly so, given the small number of signatories to the TTC, by that function creating a self-selection bias in the data. This aligns with the argument of Devos and Zackrisson[207] who suggest compliant nations have a greater likelihood of accepting disclosure, although there is some evidence of income being adjusted to avoid disclosure within the Australian setting[208] and Devos and Zackrisson[209] further highlighted those that are resistant will utilise further avoidance behaviour.

Similarly, there is the concern raised by Morton[210] of what is not captured by these disclosure regimes. The MTR offers clarity of what is within the scope of a tax consolidated group, yet it is likely that the more problematic activities are occurring beyond these boundaries. Alternatively, despite the findings by Dyreng and co-authors[211] (on public scrutiny changing disclosure and tax avoidance behaviour) and Graham and co-authors[212] (on reputation being important regarding tax planning strategy adoption), we may see the MTR and TTC as being disregarded, as having short-lived consequences, therefore creating little incentive to disclose anything beyond what is mandated.[213] Irrespective of these issues, variations in ETR do not have to represent tax aggressive sources; there can be genuine reasons for a low tax payable rate. Similarly, the fundamental nature of a voluntary tax report allows choice. As already indicated, this article does not extend the analysis to consider tax aggressiveness of the firms, as unlike in the study by Beuselinck and co-authors[214] it is considering *the public perception* response.

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[201] Board of Taxation, above n 11, 5.
[202] Wording used in the 2016-17 Commonwealth Budget Announcement. See above n 52, 11.
[203] Board of Taxation, above n 11, 5 (raising as a concern the conduct of some entities engaging in tax avoidance).
[204] Board of Taxation, above n 11.
[205] Bayerlein and Davidson, above n 15.
[206] Board of Taxation, above n 11.
[207] Devos and Zackrisson, above n 5.
[208] Hoopes et al, above n 151.
[209] Devos and Zackrisson, above n 5.
[210] Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22.
[211] Dyreng et al, above n 152.
[212] Graham et al, above n 159.
[213] See section 3.4 of this article discussing Gallemore et al, above n 153 and Hanlon and Slemrod, above n 83. Compare, eg, Chen, above n 152, who found only small negative market reactions.
[214] Beuselinck et al, above n 14.

However, driving this analysis is the mandatory disclosures and despite being publicised through the MTRs, not all companies will be under the same particular spotlight: those with higher ETRs will face less scrutiny as they may be perceived as paying their fair share of tax, whilst those with lower ETRs will face more scrutiny in terms of their public exposure[215] and following Beuselinck and co-authors,[216] present perceived benefits to obfuscate through reduce readability.

6.2 The level of public exposure

We now turn to consider public exposure, and more specifically to explore whether perceptions of low ETR through the MTR may, as Beuselinck and co-authors find,[217] lead to reduced reliance on readability. The analysis proceeds to divide the sample based on the level of public exposure using the criteria of companies with low ETR and high ETR as a proxy for publicly exposed companies.[218] Splitting the sample using the median ETR provides the two sub-samples which are of similar size. Using the median 23 per cent as cut-off between high and low ETR, there are 50 *public exposure – low scrutiny* companies as against 53 *public exposure - scrutinised* companies. Table A4 sets out the regressions using the total sample, the sample of *public exposure – scrutinised*, and the sample of *public exposure – low scrutiny*, using as dependent variables Fog, Flesch-Kincaid, and tone.

Although not the prime focus of this study, there is evidence throughout the analyses that a larger number of words on the report of *public exposure – scrutinised* companies, as measured through Ln(JFreq Words), is associated with lower readability indexes. This suggests long documents prepared by *public exposure – scrutinised* companies are easier to read, as measured by Flesch-Kincaid and Fog indexes, than short documents. The same evidence does not occur for the *public exposure – low scrutiny* companies.

As few of the variables in the models have coefficients which are statistically significant, the regressions present low *f*-values, as shown on Table A4, suggesting there is room for improvement for the models used for this analysis. Nonetheless, it is worth noting – as shown in Table 3 – the variables ETR, tone, Fog and Flesch-Kincaid, are correlated, regardless of the models.

For the sample of 53 *public exposure – scrutinised* companies, the linear regressions using the *readability* indexes do not provide coefficients which are statistically relevant. However, it is worth noting through the linear regression analysis for *public exposure – scrutinised* companies using tone as an independent variable, the ETR has a positive and statistically significant coefficient of 0.371 (t=2.574), suggesting that, for *public exposure – scrutinised* companies, a higher ETR is associated with a more positive *tone*. For the sub-sample data selection of 50 *public exposure – low scrutiny* companies, tone is not associated with ETR, whereas readability indexes remain with negative coefficients. Consistent with the findings by Inger and co-authors, this may indicate that given the higher ETR, they may be engaging in low levels of tax avoidance activities and therefore the trade-off for decision-useful information results in less concealment.[219] The linear regression confirms a high ETR associated with a low Fog

[215] Referring to creating particular public perception issues and increased inquiries: see Devos and Zackrisson, above n 5.
[216] Beuselinck et al, above n 14.
[217] Ibid.
[218] Ibid.
[219] See generally Inger et al, above n 128.

and Flesch-Kincaid (ie, reports of companies with higher ETR are easier to read) with no association whatsoever regarding tone and ETR.

Summarising, using the criteria of splitting the sample between companies with low ETR and high ETR as a proxy for public exposure and scrutiny,[220] companies which are *public exposure – low scrutiny* having a higher ETR provide reports which are easier to read (ie, high ETR is associated with low readability indexes), whereas the reports from the sub-sample of *public exposure – scrutinised* companies having a higher ETR provide reports with a more positive tone (ie, high ETR is associated with a positive tone). As such the hypotheses are accepted. The authors posit that this is consistent with Beuselinck and co-authors,[221] who find that companies will rely less on obfuscation when there are small benefits to doing so and that *attention* leads to more readable financial statements. The authors therefore concur tentatively that '*obfuscation through complexity becomes less helpful*',[222] rather than '*complexity necessitates complexity*'.[223] Importantly, the authors find that companies instead turn to tone.

However, the public perception for this category is likely to be of concern for companies, as lower ETRs suggest lower contributions to what can be described as perceptions of their 'fair share' of tax. As initially indicated in section 6.1, the positive tone may be towards the enabling of 'informed public scrutiny'[224] and towards the company's reputation.[225] However, in this instance it may be driven by the need to control the narrative[226] over perceptions of their tax compliance (or lack thereof), through creating an affect or feeling[227] and not readability. Table 4 summarises the coefficients for ETR as an independent variable for each model, sample, and sub-sample.

[220] Sidhu and Whittred, above n 32.
[221] Beuselinck et al, above n 14, 5-6. See also Hope et al, above n 35, 181-182.
[222] Beuselinck et al, above n 14, 23.
[223] Guay et al, above n 138, 258.
[224] See n 52, 11 (using this wording in the 2016-17 Commonwealth Budget Announcement).
[225] Board of Taxation, above n 11, 5 (raising as a concern the conduct of some entities engaging in tax avoidance).
[226] Ballas, above n 31, 733. See also Jameson, above n 31, 9; Li, above n 15.
[227] Henry, above n 16.

Table 4: Summary of Coefficients for ETR

Dependent variable	Total Sample (*n*=106)[a]	Public Exposure – Low Scrutiny companies (n=50)	Public Exposure - Scrutinised companies (n=53)
Tone	.414*** (*t*=4.005)	.096 (*t*=.555)	.371** (*t*=2.574)
Flesch-Kincaid	-.251** (*t*=-2.186)	-.315* (*t*=-1.908)	-.218 (*t*=-1.301)
Fog	-.246** (*t*=-2.136)	-.282* (*t*=-1.708)	-.245 (*t*=-1.472)

a There are 3 missing values regarding ETR, hence the total sample of 106 comprises of 50 public exposure – low scrutiny companies, 53 public exposure – scrutinised companies, and 3 missing values.
***. Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Overall, the findings indicate that *public exposure – scrutinised* companies resort to the tone of the report, whereas those with lower scrutiny rely on the readability of its reports. On this basis, the hypotheses are supported.

7. CONCLUSION

This research examines those companies with particular public attention (those having a low comparative tax payable as per mandated tax transparency report: '*public exposure – scrutinised*') compared to those without (higher comparative tax payable as per the mandated tax transparency report: '*public-exposure – low scrutiny*'). In examining signatories to the TTC, the authors ask, *does the level of public exposure (scrutinised/low scrutiny) arising from mandatory tax reporting impact readability and tone of voluntary tax reporting?* With such an inquiry, the article focuses on the interplay between public exposure via government intervention and voluntary tax reporting. The present study builds on the extant literature[228] by quantitatively measuring how companies are utilising VTRs to control the narrative.

Through examining the literature, the authors posit three key opportunities that entities have in controlling their tax narrative via VTRs:

1. The general lack of available tax information due to privacy regulations;
2. The lack of alignment between the accounting and taxation systems leading to a disconnectedness in available tax information; and
3. The general latitude available in voluntary disclosures.

With this in mind, the authors compare *public exposure – scrutinised* and *public exposure – low scrutiny* categories of companies, established using the *publicly acceptable threshold*.[229]

[228] See generally, Henry above n 16.
[229] The median ETR is consistent with Sidhu and Whittred's 'politically acceptable threshold': Sidhu and Whittred, above n 32.

7.1 Main findings

This article reveals that *public exposure – scrutinised* companies resort to positive tone in tax reporting, whilst those with lower scrutiny rely on the readability of reports. While present literature concerning voluntary reporting notes that tone increases as firm performance increases,[230] the authors find that as the ETR increases, the tone of reports become more positive. This, on segregating the data based on public exposure, is most apparent for *public exposure – scrutinised* companies rather than *low scrutiny* companies. With regards to readability, the authors find that reports are more readable as the ETR increases. On segregating the data based on public exposure, this is seen as evident specifically for low scrutiny companies, inferring readability is associated with higher ETR. This finding is consistent with the study by Beuselinck and co-authors,[231] where it was noted that companies will rely less on obfuscation when there are small benefits to doing so and that *attention* leads to more readable financial statements. The authors therefore concur tentatively that '*obfuscation through complexity becomes less helpful*',[232] rather than '*complexity necessitates complexity*'.[233] Importantly, the authors of the present study find that companies instead turn to tone, therefore focusing on the sentiment of disclosures in their communication.

7.2 Tax policy implications

Existing literature suggests that negative media attention and investor reactions to the MTR are evident,[234] suggesting the potential incentive to manage the narrative, particularly those companies categorised as *public exposure – scrutiny* as these will not be *perceived* to meet threshold in terms of 'fair share' of tax in Australia. This is particularly concerning as there is also evidence that companies in Australia[235] (and abroad[236]) are attempting to avoid disclosure due to the anticipated costs of disclosure, and that the MTR scope may be too narrow to reveal planning activities.[237]

In identifying whether these firms are contributing their 'fair share' of tax, the findings in the article suggest that the tone and readability of the narrative that they are presenting will impact stakeholder *perceptions* of transparency, fairness, and accountability.[238] Through maintaining the disclosures as voluntary, therefore, the systemic issue of privacy could be aptly controlled by the firm itself. Firms publishing VTRs should be particularly cautious in their selection of language and text in preparing the reports for stakeholders.

The present study feeds into research seeking to identify key compliance motivators that enhance decision-useful information and tax planning strategies that benefit internal and external firm stakeholders, and also the efforts of policy-makers seeking to provide a better-defined motivation for Australian entities to partake in VTR and greater transparency in the incentives to do so.

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[230] Eg, Huang et al, above n 97.
[231] Beuselinck et al, above n 14, 5-6. See also Hope et al, above n 35, 181-182.
[232] Beuselinck et al, above n 14, 23.
[233] Guay et al, above n 138, 258.
[234] See generally Hoopes et al, above n 151.
[235] Ibid 143.
[236] See generally Chen, above n 152.
[237] Morton, 'Corporate Tax Transparency Reporting and Benford's Law', above n 22, 19-21. Discussed further in sections 6.1 and 7.2 above.
[238] Devos and Zackrisson, above n 5 (discussing the rationale underlying disclosure of taxation information).

The finding that *public exposure – scrutinised* companies resort to the use of positive tone in tax reporting, whilst those with lower scrutiny rely on the readability of reports raises some questions, and is consistent with the Senate Economics References Committee's concerns that firms that 'push the letter and spirit of the law' will not be incentivised 'to publish tax information'.[239] The three opportunities that this article outlines therefore highlight the challenges that policy-makers face in balancing the need for confidentiality and transparency when seeking to build confidence in the corporate tax system.[240]

Despite the tone and readability concerns (and putting aside confidentiality concerns), the question arises as to whether the reports are able to overcome the differences that arise from the lack of alignment between the accounting and taxation systems. Without the connection being readily understood, it is questionable whether MTRs *or* VTRs enable true *transparency* to be achieved. However, the authors do not see this as being ultimately a goal of the policy-makers or businesses, as the basic position in Australia for tax affairs begins with a position of confidentiality.

As Devos and Zackrisson have indicated,[241] the tax-culture setting is highly important to the response to increased disclosure. As such, tax policy needs to reflect this setting, with any additional disclosures at risk of adding to a web of potentially disconnected and incomplete picture. However, the MTRs could be seen as improving the tax disclosures (via VTRs), and albeit with the ability of businesses to control the narrative through tone and readability, add value to the information environment.

7.3 Limitations

There are a number of limitations to this study. There is a limited ability to assess the influence (as opposed to association) of the impact of MTR on the tone and readability of the VTRs due to the timing of commencement not allowing a formal pre/post assessment to be carried out. With the introduction of the TTC and VTRs, what is clear is the lack of commitment from businesses reflected in the small number of signatories to the TTC, although it is arguably still in its infancy with the number increasing. A small sample size and in-built selection bias create an unavoidable limitation to this study.

Furthermore, the way in which the MTR data is disclosed creates further limitations of scope, in that the report does not disclose entities with a tax refund or a nil tax position as well as the differences between an economic entity and a tax consolidated group.[242] As outlined in section 4, this article does not extend the analysis to consider tax aggressiveness of the firms, as the focus is on the *public perception* response. Since the MTRs reveal that certain entities have low cash tax payable, which may be genuine or reflective of aggressive strategies, a potential for increasing public scrutiny exists. This study is therefore limited in its ability to reflect on the source of the low cash tax payable that leads to public scrutiny.

7.4 Future research

A plethora of lines of future research stemming from the findings of this study exists, including an examination involving how government and legislative intervention

[239] Senate Economics References Committee, *Corporate Tax Avoidance, Part 2*, above n 57, [3.12]-[3.13].
[240] Board of Taxation, above n 11, 5.
[241] Devos and Zackrisson, above n 5.
[242] See also sections 4, 5 and 6.1 of this article for further discussion.

impacts information disclosure – particularly in the COVID-19 and post COVID-19 environment. The transparency of corporate tax information is becoming increasingly important to satisfy both government and community requirements. The authors note, however, that the approach in which this is achieved needs to be carefully assessed to determine whether disclosures are appropriate and fit for purpose, offering numerous avenues for future research.

Further research should consider the alignment between the accounting and taxation systems, for example by assessing VTR output triangulated with the GPFS and MTR output. This would assist in assessing the extent to which complexity of disclosure regimes impacts the quality of information in a VTR. Moreover, examining company incentives behind signing on to the TTC will also be important, including determining to what extent they seek to control the narrative (for example, in order to manage reputational harm and to what extent the TTC allows for conservative voluntary disclosures to be made[243]), whether they perceive the disclosures as effective in better informing public scrutiny,[244] and whether the process underpinning the TTC is fostering an internal culture that is shifting towards public transparency.[245]

Additionally, expanding the analysis to examine the source of low (high) levels of tax payable is warranted, ie, examining whether proxies for tax aggressiveness impact the associations identified. As already indicated, this article does not extend the analysis to consider tax aggressiveness of the firms, as unlike in the study by Beuselinck and co-authors[246] it is considering *the public perception* response. Further research should consider the impact of tone and readability in relation to the MTR/VTR comparison, bringing in the aggressiveness variable.

In the above context, this research makes three contributions to the literature. First, the article extends existing research exploring complexity and VTR, falling within a contentious and critical area of thought: the corporate tax system. The TTC and its signatories create a novel data set, previously not available dealing with an area of business that faces particularly strong scrutiny: whether companies are *perceived* (or *actually*) contributing their 'fair share' of the tax burden. Secondly, the article extends existing research exploring readability and tone within the context of voluntary reporting. The authors find that the level of public exposure impacts the interplay between readability and tone of VTRs. Thirdly, this extends the research through considering how attention, such as government intervention, impacts such information disclosure. The authors posit that the interplay between MTR and VTR creates a positive outcome for limiting opportunities for obfuscation, supporting the hypotheses of the study. While the article sets out three key opportunities for companies to control the narrative, MTRs counter these opportunities, and despite the lack of alignment between MTRs and VTRs create a level of attention otherwise not present.

[243] Graham et al, above n 159, 1000.
[244] Australian Treasury, above n 52, 11.
[245] Board of Taxation, above n 11.
[246] See generally Beuselinck et al, above n 14.

APPENDIX

Table A1: Critical Analysis of Disclosure Principles According to Devos and Zackrisson

Principle	Transparency	Tax Fairness	Accountability	Privacy
Disclosure/ Advantages	Regulators to supported in policing corporate governance. Improved functionality of financial markets. Promotion of tax compliance. Application of political pressure for good tax policy.	Provides the opportunity for tax authorities to reveal who are not paying their fair share. Perception of fairness created if community believes that public disclosure will improve compliance.	Increases accountability of governments. In a system that is built on self-assessment, disclosure increases the visibility of the tax authorities work as for example the ATO aggregate statistics does not reveal the reasoning underpinning (fairness) focus on certain taxpayers.	Query the reason for not asking nor searching for tax discrepancies due to privacy concerns. Privacy no longer plays a critical role in facilitating tax compliance. Disclosure serves as an 'automatic enforcement device'. Tax compliance tool for intentional and unintentional non-compliance. Enhance good governance and tax administration and productivity due to better ability to target taxpayers and use of limited resources.
Against Disclosure/ Dis-advantages	Inhibit confidentiality. Potential to create confusion amongst stakeholders. The provision of unbalanced power in favour of the Federal government. Unintended behavioural response from end-user. Disclosure level problems including that different taxpayers could become more transparent than others; variation in taxpayer disclosure; and uncertainty with regards required scope of taxpayer disclosure.			Enables the inflation of taxpayers' perceptions of probability of detection and expected costs of non-disclosure Alternatively, create tax-enforcement weaknesses and lower perceptions of the magnitude of penalties

Sources	Lenter, Shackelford, and Slemrod (2003)[247]	Hite and Roberts (1992);[248] Chan, Troutman, and O'Bryan (2000);[249] Tan (1998)[250]	Kornhauser (2005)[251]	Blank (2011; 2013);[252] Kornhauser (2005);[253] Linder (1990);[254] Mazza (2003);[255] Schwartz (2008);[256] Thorndike (2009);[257] Bernasek (2010)[258]

Source: adapted with reference to Devos and Zackrisson[259]

[247] David Lenter, Douglas Shackelford and Joel Slemrod, 'Public Disclosure of Corporate Tax Return Information: Accounting, Economics, and Legal Perspectives' (2003) 56(4) *National Tax Journal* 803.
[248] Peggy A Hite and Michael L Roberts, 'An Analysis of Tax Reforms Based on Taxpayers' Perceptions of Fairness and Self-Interest' (1992) 4 *Advances in Taxation* 115.
[249] Chris W Chan, Coleen S Troutman and David O'Bryan, 'An Expanded Model of Taxpayer Compliance: Empirical Evidence from the United States and Hong Kong' (2000) 9(2) *Journal of International Accounting, Auditing and Taxation* 83.
[250] Lin Mei Tan, 'Taxpayers' Perceptions of the Fairness of the Tax System – A Preliminary Study' (1998) 4 *New Zealand Journal of Taxation Law and Policy* 59.
[251] Marjorie E Kornhauser, 'Doing the Full Monty: Will Publicizing Tax Information Increase Compliance?' (2005) 18(1) *Canadian Journal of Law and Jurisprudence* 95.
[252] Joshua D Blank, 'In Defence of Individual Tax Privacy' (2011) 61 *Emory Law Journal* 265; Joshua D Blank, 'United States National Report on Tax Privacy' (New York University Law and Economics Working Paper No 332, 2013).
[253] Kornhauser, above n 251.
[254] Marc Linder, 'Tax Glasnost for Millionaires: Peeking Behind the Veil of Ignorance along the Publicity-Privacy Continuum' (1990) 18 *New York University Review of Law and Social Change* 951.
[255] Stephen W Mazza, 'Taxpayer Privacy and Tax Compliance' (2003) 51 *Kansas Law Review* 1065.
[256] Paul Schwartz, 'The Future of Tax Privacy' (2008) 61(4) *National Tax Journal* 883.
[257] Joseph J Thorndike, 'Show Us the Money' (2009) 123 *Tax Notes* 148.
[258] Anna Bernasek, 'Should Tax Bills Be Public Information?', *New York Times* (Online, 13 February 2010) 11.
[259] Devos and Zackrisson, above n 5, 110-111 (citations omitted).

Table A2: VTRs and Summary of Outcomes

PANEL A: SIZE BY DISCLOSURE			2014	2015	2016				Sub-total	2017				Sub-total	2018	Total	
	Size	Disclosure	TR	TR	AR	CG	CSR	TR		AR	CG	CSR	TR		TR		
	Large	Part A & B	1	4	3	0	5	49	57	6	0	2	51	59	1	122	83.0%
		Part B	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.7%
		Sub-total: Large	1	5	3	0	5	49	57	6	0	2	51	59	1	123	83.7%
	Medium	Part A & B	0	1	0	1	0	3	4	0	1	0	1	2	0	7	4.8%
		Part A & Partially B	0	1	1	0	0	1	2	0	0	0	0	0	0	3	2.0%
		Part A	0	0	2	0	0	3	5	2	0	0	0	2	0	7	4.8%
		Sub-total: Medium	0	2	3	1	0	7	11	2	1	0	1	4	0	17	11.6%
	Neither	Part A & B	0	0	0	0	0	3	3	0	0	0	3	3	0	6	4.1%
	Nil*	Nil*	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0.7%
	Total		1	7	6	1	5	59	71	9	1	2	55	67	1	147	100.0%
			0.7%	4.8%	4.1%	0.7%	3.4%	40.1%	48.3%	6.1%	0.7%	1.4%	37.4%	45.6%	0.7%	100.0%	

PANEL B: DISCLOSURE TYPE	Part A & B	1	5	3	1	5	55	64	6	1	2	55	64	1	135	91.8%
	Part A & Partially B	0	1	1	0	0	1	2	0	0	0	0	0	0	3	2.0%
	Part A	0	0	2	0	0	3	5	2	0	0	0	2	0	7	4.8%
	Part B	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.7%
	Nil*	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0.7%
	Total	1	7	6	1	5	59	71	9	1	2	55	67	1	147	100.0%
PANEL C: REPORT TYPE	Stand Alone Tax Report (TR)	1	7	-	-	-	59	59	-	-	-	55	55	1	123	83.6%
	Within Annual Report (AR)	-	-	6	-	-	-	6	9	-	-	-	9	-	15	10.2%
	Within Corporate Governance Report (CG)	-	-	-	1	-	-	1	-	1	-	-	1	-	2	1.4%
	Within CSR/Sustainability Report (CSR)	-	-	-	-	5	-	5	-	-	2	-	2	-	7	4.8%
	Total	1	7	6	1	5	59	71	9	1	2	55	67	1	147	100.0%

*Information missing from database.

Table A3: Descriptive Statistics

Variable	N	Range	Minimum	Maximum	Mean	Median	Std. Deviation
JFreq Words	106	10,615	147	10,762	2,239.78	1,826.00	1,809.99
Ln(JFreq Words)	106	4.29	4.99	9.28	7.499	7.509881712	0.64488
Fog	105	16.1	12.7	28.8	18.666	18.441	2.9439
Flesch-Kincaid	105	16.1	9.4	25.5	14.666	14.392	2.8081
Tone	106	0.047	-0.0177	0.0293	0.005985	0.005828	0.0067194
Total Income $000	103	$63,804,586	$107,050	$63,911,636	$8,647,590	$2,546,472	$13,554,529
Taxable Income $000	103	$13,511,203	$0	$13,511,203	$1,092,425	$155,516	$2,623,579
Tax Payable $000	103	$3,937,948	$0	$3,937,948	$256,527	$30,674	$675,075
Market Cap (1/6/2019) $000	73	$138,320,099	$661,901	$138,982,000	$19,883,172	$9,056,500	$28,288,462
Ln(Total Income)	103	6.39	18.49	24.88	21.9118	21.6580	1.37559
Ln(Taxable Income)	103	23.33	0	23.33	17.2287	18.8623	6.215
Ln(Tax Payable)	103	22.09	0	22.09	13.6419	17.2389	7.94421
Ln(Market Capitalisation)	73	5.35	20.31	25.66	23.0502	22.9267	1.12139
Effective Tax Rate	103	30%	0%	30%	17.63%	23.00%	12.01%
Valid N (listwise)	72						

Table A4: Regressions

Panel A: Total Sample

	FOG			Flesch-Kincaid			Tone		
Variable	Coef.	*t*	Sig.	Coef.	*t*	Sig.	Coef.	*t*	Sig.
Constant		3.110	0.003		2.396	0.019		0.401	0.689
Ln(Market Capitalisation)	0.106	0.863	0.391	0.143	1.169	0.246	0.147	1.332	0.187
Effective Tax Rate	- 0.246	- 2.136	0.036	- 0.251	- 2.186	0.032	0.414	4.005	0.000
Ln(JFreq Words)	- 0.265	- 2.172	0.033	- 0.279	- 2.294	0.025	- 0.328	- 2.998	0.004
Adjusted R-Squared	0.074			0.083			0.257		
F-value	2.890			3.129			9.188		
Prob. F	0.042			0.031			0.000		
N	106			106			106		

Panel B: Public Exposure - Scrutinised

	FOG			Flesch-Kincaid			Tone		
Variable	Coef.	*t*	Sig.	Coef.	*t*	Sig.	Coef.	*t*	Sig.
Constant		0.456	0.651		0.239	0.813		- 0.456	0.651
Ln(Market Capitalisation)	0.323	1.852	0.073	0.320	1.828	0.077	0.260	1.728	0.093
Effective Tax Rate	- 0.245	- 1.472	0.151	- 0.218	- 1.301	0.202	0.371	2.574	0.015
Ln(JFreq Words)	- 0.336	- 1.991	0.055	- 0.341	- 2.011	0.053	- 0.406	- 2.781	0.009
Adjusted R-Squared	0.086			0.079			0.318		
F-value	2.123			2.030			6.604		
Prob. F	0.116			0.129			0.001		
N	53			53			53		

Panel C: Public Exposure - Low Scrutiny

	FOG			Flesch-Kincaid			Tone		
Variable	Coef.	*t*	Sig.	Coef.	*t*	Sig.	Coef.	*t*	Sig.
Constant		4.442	-		3.786	0.001		0.519	0.607
Ln(Market Capitalisation)	- 0.166	- 0.924	0.363	- 0.079	- 0.438	0.664	0.059	0.311	0.758
Effective Tax Rate	- 0.282	- 1.708	0.098	- 0.315	- 1.908	0.066	0.096	0.555	0.583
Ln(JFreq Words)	- 0.159	- 0.881	0.385	- 0.182	- 1.008	0.321	- 0.274	- 1.452	0.157
Adjusted R-Squared	0.076			0.074			0.017		
F-value	1.935			1.908			0.806		
Prob. F	0.144			0.149			0.500		
N	50			50			50		

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Taxation of automation and artificial intelligence as a tool of labour policy

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Abstract

Rapidly developing automation technology risks creating a mass displacement of human labour. An automation tax could slow the adoption of such technology in appropriate circumstances, giving workers time to adapt. Implementing the tax through changes to the existing schedular system of depreciation/capital allowances would reduce the uncertainty of application and costs, and be flexible enough to keep up with rapid technological developments. The mechanism would adjust: 1) accelerated depreciation, and 2) bonus depreciation. The tax provides a useful tool to counter sudden and massive labour displacement, but must be applied with care so as not to disincentivise efficiency gains.

Key words: automation taxation; tax policy; depreciation; capital allowances; technology tax

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1. INTRODUCTION

The world has gone through several periods of rapid developments in technology over the years, commonly referred to as 'Industrial Revolutions'. Historically, the positive effects of such technological developments on the economy have considerably outweighed the disruptive impact on employment.[1] Each time, the world has benefited from greater aggregate economic output, a reduction in the need for menial labour, higher labour productivity and higher wages, as well as the creation of new job opportunities.[2] The mass displacement of human labour rendered obsolete by technological advancements[3] has been painful in the short term, but displaced workers have been able to adapt to changing job demands and secure gainful employment.

At the moment, the world is in the 'Fourth Industrial Revolution', as new developments in manufacturing robots, artificial intelligence and the Internet of Things (IoT) are rapidly being deployed in industries. The key question is whether the 'Fourth Industrial Revolution' will produce different effects from its predecessors. It might be fair to think that if labour markets have successfully adjusted to the past three Industrial Revolutions, this time would be no different. Section 2 of this article submits that there are good reasons for thinking that things may be a little different in the 'Fourth Industrial Revolution'. But even if the labour markets eventually do adjust to the changes this time, it is quite likely that the adjustments will take much longer than they did in the previous Industrial Revolutions. This means that there may be a need for a policy tool to control the pace at which technological developments affect the labour market.

There is a strong theoretical basis for government intervention in the labour market in the 'Fourth Industrial Revolution'. Technological developments give rise to increased automation, which in turn induces worker displacement, resulting in social costs arising from the need to support and retrain displaced workers, which constitute a negative externality. This kind of market failure is commonly tackled by some kind of Pigouvian tax designed to make the creator of the externality pay for causing it. In this article, we label this Pigouvian tax the 'automation tax' and submit that it should have two aims: first, to slow the introduction of automation technology in industries which would otherwise suffer rapid and massive unemployment, so as to provide as much time as possible for governments, welfare systems, and workers to prepare for the impending effects of structural unemployment; second, to impose a tax on companies that automate so as to generate revenue for the support and reskilling of displaced workers. Section 3 of this article addresses this point in detail.

As far as Pigouvian taxes are concerned, one of the better-studied models on an externality that has considerable international implications is the emissions pricing

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[1] Martin Ford, *The Rise of the Robots: Technology and the Threat of a Jobless Future* (Basic Books, 2015) 27; Daniel Šmihula, 'The Waves of the Technological Innovations of the Modern Age and the Present Crisis as the End of the Wave of the Informational Technological Revolution' (2009) 1 *Studia politica Slovaca* 32.

[2] Sarah Kessler, 'The Optimist's Guide to the Robot Apocalypse', *Quartz* (9 March 2017), https://qz.com/904285/the-optimists-guide-to-the-robot-apocalypse (accessed 26 November 2021); Šmihula, above n 1, 32.

[3] L Vivian Dong, 'Policy Responses to Technological Unemployment' (working paper, 30 September 2017) 1, https://onlabor.org/wp-content/uploads/2017/10/Dong-L-Vivian-CPT-Paper-1018-version.pdf (accessed 26 November 2021); Carl Benedikt Frey and Michael Osborne, 'The Future of Employment: How Susceptible are Jobs to Computerisation?' (Oxford Martin School Working Paper, 1 September 2013) 3.

model. Just like automation, emissions also raise an issue of 'leakage', where policies enacted in one jurisdiction may lead to the shifting of the externality to another jurisdiction. Section 4 of this article will analyse this model to see if any lessons in tax design can be derived from it.

However, we will eventually conclude in section 5 that there is a crucial difference between emissions pricing and an automation tax, which renders the former unsuitable as a model for the latter. Nevertheless, understanding this difference is important as it highlights the considerations that must be taken into account when designing the automation tax. The article will go on to briefly consider several other models for automation taxation that have been proposed by various authors, before laying out a framework for assessing the design and implementation challenges for an automation tax based on the lessons derived from the other models.

In section 6, we propose that an automation tax could be implemented by building on the existing system of depreciation/capital allowances. The two main dimensions that may be adjusted to produce intended distortionary effects are: 1) accelerated depreciation, and 2) bonus depreciation. Finally, we note that while the benefits of efficiency gains mean that the automation tax is unlikely to have widespread application, it does provide a useful tool for specific situations where the rate of automation needs to be slowed due to its resultant social costs.

2. BACKGROUND

Technological advancement has always had a significant effect on employment and the economy.[4] The near-simultaneous introduction of clusters of related technologies with broad applications – in other words, the appearance of a technological wave or revolution – has historically been particularly disruptive.[5] The recent explosion in progress in a closely-linked cluster of areas such as robot dexterity, machine learning, processing power, and sensor capabilities appears to herald a new technological wave with profound economic implications. Commentators have dubbed this the 'Fourth Industrial Revolution'.[6]

As discussed in section 1, the key question is whether this Industrial Revolution will be different from its predecessors. Of course if there is little difference, then we might well expect that the labour market will correct itself, with no need for any form of automation tax to begin with. Several commentators have noted that despite the fact that people have often been worried during past Industrial Revolutions, the labour market has always eventually adjusted to the changes.[7] In fact, there appears to be a hint of

[4] Theodore Lewis, 'Studying the Impact of Technology on Work and Jobs' (1996) 33(3) *Journal of Industrial Teacher Education* 44, 44-46.
[5] Joseph Bower and Clayton Christensen, 'Disruptive Technologies: Catching the Wave' (1995) 73(1) *Harvard Business Review* 43.
[6] Ben Vermeulen, Jan Kesselhut, Andreas Pyka and Pier Paolo Saviotti, 'The Impact of Automation on Employment: Just the Usual Structural Change?' (2018) 10(5) *Sustainability* 1661.
[7] Gerlind Wisskirchen, Blandine Thibault Biacabe, Ulrich Bormann, Annemarie Muntz, Gunda Niehaus, Guillermo Jiménez Soler and Beatrice von Brauchitsch, *Artificial Intelligence and Robotics and Their Impact on the Workplace* (International Bar Association Global Employment Institute, 2017) 118; McKinsey Global Institute, *A Future that Works: Automation, Employment, and Productivity* (McKinsey and Company, 2017) 102-103,

'Industrial Revolution exceptionalism'. In other words, people tend to think that 'this time will be different', even though the labour market does eventually adjust to the changes.[8]

2.1 The central uniting notion of autonomy

However, it is worth exploring the possibility that 'this time may indeed be different'. Commentators have noted that historically, most of the work that had been automated tended to be physical and routine, whereas the work that can potentially be automated this time tends to be a lot more cognitive.[9] In the 'Fourth Industrial Revolution', the central notion of autonomy unites the cluster of technological developments. The cost of automation has fallen dramatically, making automation more cost-effective for many more industries and companies, while the capabilities of automation technology have expanded on multiple fronts, including information collection, data processing, and physical action.[10] To illustrate the magnitude and implications of these improvements, we will briefly explore three examples of the dramatic progress and impact of automation technology on the economy.

2.1.1 Manufacturing robots

Significant progress has been made in the physical capabilities and dexterity of robots, such that they are presently able to perform tasks, such as fabric sewing, that could previously only be performed by humans. This progress has been enabled by improvements in sensor capabilities, which enable robots to have a greater awareness of their environment, improvements in processing power, which enable robots to perform the calculations required to execute complex tasks, and improvements in machine learning, which enable robots to identify the appropriate techniques for executing complex tasks.[11]

2.1.2 Artificial intelligence

Algorithms have become dramatically better at identifying patterns and making judgments due to the greater availability of the data used as raw material for these algorithms, as well as an increase in processing power that has made it possible to process and interpret the vast quantity of available data.[12] Algorithms are used in

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https://www.mckinsey.com/~/media/mckinsey/featured%20insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20future%20that%20works/MGI-A-future-that-works-Full-report.ashx (accessed 26 November 2021).

[8] Wisskirchen et al, above n 7, 118; McKinsey Global Institute, *A Future that Works*, above n 7, 102-103.

[9] McKinsey Global Institute, *A Future that Works*, above n 7, 103, citing Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (W W Norton, 2014).

[10] Frey and Osborne, above n 3, 3; Craig Melrose and Jonathan Tilley, 'Automation, Robotics, and the Factory of the Future', in McKinsey and Company, *The Great Re-Make: Manufacturing for Modern Times* (2017) 67.

[11] Frey and Osborne, above n 3, 3; Melrose and Tilley, above n 10.

[12] Dave Cliff, 'The Impact of Technology Developments', in *The Future of Computer Trading in Financial Markets* (UK Government Office for Science Working Paper, 2011) 40, 43-46; McKinsey Global Institute, *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation* (McKinsey and Company, December 2017) 24.

artificial intelligence programs, which, due to their inherent speed, reliability, and scalability, now possess an advantage over humans in areas such as securities trading.[13]

2.1.3 The internet of things (IoT)

Sensors, processors, and networking capabilities are now sufficiently cheap and sufficiently miniaturised to be embedded into everyday objects, creating wide networks of interconnected objects that are able to independently collect, process and transmit information.[14]

2.2 The magnitude of the change

While previous technological revolutions have also resulted in structural and frictional unemployment, it is likely that the present wave of automation will be more disruptive than before, for several reasons. First, while previous technological innovations did not eliminate the need for human labour to operate and control technology, the autonomous nature of the present wave of technologies threatens to substitute human labour to a greater extent by fully eliminating the need for human intervention in the autonomous execution of a given task.[15] Secondly, unlike previous technological innovations that have been limited in the scope of their applicability, autonomous technology is a general-purpose technology with a much wider set of capabilities – ranging from physical action to information processing – and hence has greater potential for disruptive impact across a wider range of sectors.[16]

2.3 The time dimension

As this Industrial Revolution involves the automation of work that is more cognitive than physical, it is likely that adjusting to the changes will take much longer than in previous Industrial Revolutions. This problem is exacerbated by the likelihood that there will be less time for governments to react to automation due to the rapid rate of progress in automation technology; Moore's Law, for instance, predicts that the computing power of a microchip doubles every two years.[17] On the whole, it is the substitutability, scale, and speed of automation which distinguish it from previous waves of technological innovation and strengthen the impetus for government intervention. In particular, there may be a need for a policy tool to control the pace at which technological developments affect the labour market.

3. THE CASE FOR AN AUTOMATION TAX

The proposal to introduce an automation tax requires a strong theoretical basis. This article focuses on an economic basis as the normative justification for an automation tax.[18] It argues that increased automation induces worker displacement, resulting in

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[13] Cliff, above n 12, 49; McKinsey Global Institute, *Jobs Lost, Jobs Gained*, above 12, 24.
[14] McKinsey Global Institute, *Jobs Lost, Jobs Gained*, above 12, 24; Felix Wortmann and Kristina Flüchter, 'Internet of Things: Technology and Value Added' (2015) 57(3) *Business and Information Systems Engineering* 221.
[15] Ford, above n 1, xvi-xviii, and 17.
[16] Ibid, xvi-xviii, and 26-27.
[17] Gordon Moore, 'Cramming More Components onto Integrated Circuits' (1965) 38(8) *Electronics* 114.
[18] For a more general discussion of, *inter alia*, the normative case for an automation tax, see Bronwyn McCredie, Kerrie Sadiq and Larelle Chapple, 'Navigating the Fourth Industrial Revolution: Taxing Automation for Fiscal Sustainability' (2019) 44(4) *Australian Journal of Management* 648.

social costs arising from the need to support and retrain displaced workers, which constitute a negative externality. Such market failures can be countered through the use of a Pigouvian tax.

3.1 Automation and employment

In the short-term, automation is likely to alter existing jobs by catalysing changes in the scope and nature of a large proportion of existing occupations. Automation is able to promise better results for lower costs in the performance of specific tasks, giving firms a strong incentive to automate these tasks and subsequently redesign jobs such that workers complement technology by performing other tasks that cannot yet be practicably automated. These redesigned jobs will be constituted by a different mix of tasks: for instance, it is conceivable that tasks that are repetitive and menial will be replaced by tasks that require critical thinking or the management of interpersonal relationships.

3.2 Job displacement as a negative externality of automation

The negative effects of job alteration are likely to be significant. Some workers may find that their skills are no longer relevant due to the full automation of tasks associated with those skills; they may thus face structural unemployment.[19] The impact of automation is not evenly distributed: business owners may succeed in capturing the gains from automation instead of raising employment or wages, and highly-skilled workers that better complement automation may benefit more than the low-skilled workers whose jobs are easily automated.

3.2.1 The pattern of job displacement

Automation technology is currently still maturing. Recent breakthroughs or advancements have not all already translated into commercially viable systems or equipment, and the adoption rate for automation technology will differ across firms and industries.[20] Hence, the impact of automation at any given point in time is unlikely to be significant across the entire economy, but is instead likely to be disproportionately large for some sectors or job classes.[21] To illustrate, sectors that are likely to be early adopters of automation include insurance and manufacturing, and job classes that are vulnerable to automation include clerical or administrative jobs.[22]

The concentrated nature of automation's effects means that worker displacement is likely to be limited to a few sectors or job classes at any point in time.[23] However, there is a strong need for intervention in such sectors as displaced workers are likely to find it more difficult to transition to new jobs if most jobs in the same sector or job class are contemporaneously vulnerable to automation.[24] In other words, there is no need as yet for a radical overhaul of corporate or labour policy, but there is a strong need for policy

[19] Frey and Osborne, above n 3, 3; Vermeulen et al, above n 6, 6-7.
[20] Brett S Sharp, 'Policy Implications of People Analytics and the Automated Workplace' in Ryan Kiggins (ed), *The Political Economy of Robots: Prospects for Prosperity and Peace in the Automated 21st Century* (Palgrave Macmillan, 2018) 61, 62-63; David Gruen, 'The Future of Work' (2017) 33(3) *Policy* 3, 4-5.
[21] Gruen, above n 20, 6-7.
[22] Frey and Osborne, above n 3, 57-72.
[23] Vermeulen et al, above n 6, 13-15.
[24] Dong, above n 3, 3; Vermeulen et al, above n 6, 13-15.

measures targeted at mitigating the impact of automation on specific sectors or job classes.

In some sectors, technological advancements may make it feasible and economically compelling for companies to fully automate an entire class of jobs.[25] A major problem ensues if the workers that perform these jobs are not typically required to possess skills that would allow them to perform alternative tasks or jobs. An archetypal example of this is the potential effect that self-driving trucks pose to truck drivers. Unlike other cases of automation like the introduction of automated teller machines, which were unable to perform all of the functions that human tellers performed, self-driving trucks could fully automate the roles of today's truck drivers. Notwithstanding the fact that truck drivers may need to monitor self-driving trucks in the short-run,[26] self-driving cars still have the potential to displace truck drivers from their jobs one day. Furthermore, as the main skill of a truck driver is driving, these drivers are unlikely to possess skills that would allow them to perform alternative jobs or tasks, unlike bank tellers who would have been able to find employment in other customer service roles. Hence, automation in cases similar to that of self-driving trucks is likely to result in the long-term structural unemployment of a large class of workers. The need for intervention in such sectors is therefore particularly acute.

3.3 An automation tax

The upshot is that automation, by inducing worker displacement, results in social costs arising from the need to support and retrain displaced workers. As these costs are borne by the worker or by society, instead of being borne by the company that makes the decision to automate, these social costs constitute a negative externality.[27] The causal relationship between the acts of automation performed by firms and the resulting negative externality of job displacement creates a *prima facie* case for the state to intervene by discouraging or penalising these externality-generating acts of automation. Such an intervention could take the form of a Pigouvian tax,[28] which is imposed on an agent responsible for an externality for the purpose of mitigating that externality. In this case, such a tax would potentially apply to all the technologies that make up the present wave of technological innovation – imposed on companies that automate through the deployment of automated systems or equipment in their production process.

However, the appropriate policy response is not to impose a blanket tax on automation, but instead to recognise the distinction between automation's employment-substituting[29] and employment-complementing[30] effects, so as to reward instances of the latter while disincentivising instances of the former. Employment-substituting

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[25] Brian Heater, 'Technology is Killing Jobs, and Only Technology Can Save Them', *TechCrunch* (27 March 2017), https://techcrunch.com/2017/03/26/technology-is-killing-jobs-and-only-technology-can-save-them/ (accessed 26 November 2021); Vermeulen et al, above n 6, 13-15.

[26] See, for example, Simon Montlake, 'Self-Driving Trucks in US Offer Window Into Where Machines May Replace Humans', *Christian Science Monitor* (14 November 2018), https://www.csmonitor.com/USA/Society/2018/1114/Self-driving-trucks-in-US-offer-window-into-where-machines-may-replace-humans (accessed 26 November 2021).

[27] Nicolaus Tideman and Florenz Plassmann, 'Pricing Externalities' (2010) 26(2) *Journal of Economic Literature* 176.

[28] Jonathan Masur and Eric Posner, 'Toward a Pigovian State' (Coase-Sandor Working Paper Series in Law and Economics, 2015).

[29] Vermeulen et al, above n 6, 3-4.

[30] Ibid.

capital displaces workers, while employment-complementing capital leads to higher demand for labour. While such a distinction may be hard to make, the policy response best exploits the potential of automation to raise productivity and generate employment opportunities, while limiting its potential for job displacement.

The aims of an automation tax are two-pronged: first, to slow the introduction of automation technology in these industries, so as to provide as much time as possible for governments, welfare systems, and workers to prepare for the impending effects of structural unemployment; second, to impose a tax on companies that automate so as to generate revenue for the support and reskilling of displaced workers. Regulators must take care to only adopt these policy responses in the small number of cases where structural unemployment is widespread, irreversible, and clearly attributable to automation.

3.4 Reforming the existing tax system

The existing tax system is likely to be ill-suited for dealing with the challenges posed by the 'Fourth Industrial Revolution'. The existing tax systems of most developed nations give employers an incentive to make capital investments, but do not give similar incentives for employment.[31] This imbalance in incentives arises from the fact that tax deductions on investment in physical assets, such as capital allowances, are granted in many jurisdictions,[32] while payroll taxes are commonly imposed for every human employee. Historically, capital allowances and other incentives for investment have encouraged firms to make investments in capital that in turn raise the competitiveness and productivity of human labour, resulting in a boost to the economy's productive capacity while providing opportunities for workers.[33] Moving ahead, however, it is not clear if capital investment will continue to complement human labour in this way, as automation displays an increasing potential to substitute and displace workers.

Furthermore, while structurally unemployed workers could adapt by reskilling and finding opportunities in new industries, the rapid rate at which automation technology is improving[34] could leave workers with insufficient time to adjust. Given the increasing potential and rapid progress of modern technological innovations, tax systems should provide employers with an incentive to moderate the pace of displacement while continuing to encourage firms to make capital investments in ways that provide opportunities for workers. There is an urgent need to reform the tax system to shift from the present blanket approach to incentivising investment, and instead move towards encouraging labour-complementing investments while discouraging labour-substituting investments.

4. EMISSIONS PRICING AS A MODEL FOR AUTOMATION TAXATION

One of the better-studied models of Pigouvian taxes that involves an externality with considerable international implications is the emissions pricing model. There are several similarities between the externalities which are sought to be addressed under emissions

[31] United Nations Conference on Trade and Development (UNCTAD), 'Tax Incentives and Foreign Direct Investment: A Global Survey' (ASIT Advisory Studies No 16, 2000) 14-19.
[32] Ibid 19-22.
[33] Stanley Surrey, 'Tax Incentives as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditures' (1970) 83(4) *Harvard Law Review* 705; UNCTAD, above n 31, 14-19.
[34] Vermeulen et al, above n 6, 1-3.

pricing and automation taxation. Thus, it may be worthwhile studying the former, to see if it can serve as a useful model for automation taxation. Emissions pricing, or the imposition of a price on greenhouse gas emissions that is payable by emitters, is an example of a Pigouvian tax and has been adopted by several jurisdictions as a response to the negative externality of climate change arising from greenhouse gas emissions.[35] Analogously, a price could be imposed on the deployment of automated systems or equipment by firms, as a response to the negative externality of worker displacement caused by such automation. Just like automation, emissions also raise an issue of 'leakage', where policies enacted in one jurisdiction may lead to the shifting of the externality to another jurisdiction.

4.1 Theoretical optimality of Pigouvian taxation

A policy of pricing the externality by imposing a tax constitutes a market-based solution to the externality. The intended policy outcome of minimising the size of the externality is achieved not by prescribing or proscribing the actions of agents, but by adjusting the market prices associated with certain actions in order to fully reflect the externalities of these actions. While the intent is to influence agent behaviour by adjusting prices, these agents retain the ability to freely choose their actions and to generate the externality under market-based solutions. These market-based solutions have the advantage of achieving socially-optimal outcomes through the decentralised choices of independent and incentive-driven agents, eliminating the need for governments to undertake the challenging task of determining and dictating what the socially-optimal behaviour would be for each individual agent.[36] The need to correct the market failure arising from the externalities generated by rapid and massive displacement of labour due to automation provides the theoretical justification for government intervention in the form of an automation tax.[37]

4.2 Implementation approaches

Regulators must determine the size of the externality generated by each agent, so as to tax it and cancel out the externality. There are two possible ways of doing so. The first approach is for regulators to directly estimate the social costs arising from the actions of each individual agent.[38] It is often difficult to identify or attribute the individual causal contribution of each agent to the social costs that are collectively generated.[39]

The alternative to directly observing the size of the externality generated is to infer its size from observations of the intensity or extent of the agent's externality-generating actions.[40] This is usually achieved in the following way. First, the intensity or extent of the agent's externality-generating actions is quantified and measured in terms of a chosen unit of taxation, and then used as a tax base. Next, a specified tax rate is imposed

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[35] Masur and Posner, above n 28, 1-6.
[36] Ibid; Joseph Petrucelli and Jonathan Peters, *Preventing Fraud and Mismanagement in Government: Systems and Structures* (John Wiley and Sons, 2017) 87-88.
[37] For a more in-depth discussion of the other possible theoretical bases for taxing automation, see McCredie et al, above n 18, 652-655.
[38] Joel Slemrod and Christian Gillitzer, *Tax Systems* (MIT Press, 2014) ch 10 ('Optimal Observability and Complexity').
[39] Warren Samuels, *Economics, Governance and Law: Essays on Theory and Policy* (Edward Elgar, 2002) 160.
[40] William J Baumol, 'On Taxation and the Control of Externalities' (1972) 62(3) *The American Economic Review* 316.

on each unit of the tax base, such that the overall tax imposed on each agent is equivalent to the tax rate per unit multiplied by the tax base as measured in the same units. This overall tax payable will be a close approximation of the size of the externality generated by the agent, and hence will be economically optimal, if the tax meets the following conditions.

First, the agent's externality-generating actions must be quantified in terms of a single, standardised unit that applies to all externality-generating agents. This common unit of quantification allows the tax base to be computed for each agent. Second, it must be feasible to accurately measure the intensity or extent of the agent's externality-generating actions in terms of the specified unit of taxation. This allows the tax base to be determined for each agent, hence enabling the practical enforcement and administration of the tax. Finally, the size of the tax base, or the intensity or extent of the agent's externality-generating actions as measured in terms of the specified unit of taxation, must be proportional to the size of the externality. This will allow regulators to impose a constant amount of tax for each unit of the externality-generating action.

These conditions are met in the case of the European Union's Emissions Trading System (ETS),[41] which imposes a tax on each company based on its contribution to climate change, which is quantified in terms of the total potential warming effects of the greenhouse gases it emits.

The unit of quantification used under the ETS is typically MMTCDE, or million metric tonnes of carbon dioxide equivalents.[42] The tax base can be measured in terms of these units using a three-step procedure: first, the amount in million metric tonnes (MMT) of each greenhouse gas emitted by an agent is measured; second, to account for differences in the environmental effects of different greenhouse gases, the amount in MMT emitted for each greenhouse gas is converted into MMTCDE using the associated global-warming potential (GWP) for that gas; third, the total size of the tax base is obtained by summing the amount emitted in MMTCDE across all greenhouse gases.[43] MMTCDEs are a suitable unit of quantification, as they provide a single measure of the total effect of the many different types of greenhouse gases that could be emitted, and as such can serve as a common unit of quantification across companies that emit different types of gases.[44] Hence, the first condition of a quantifiable tax base is met in the case of the EU ETS.

The second condition, which is the practicability of measuring the tax base, is also fulfilled in the case of the EU ETS. The amount of greenhouse gases emitted by each

[41] Denny Ellerman, Claudio Marcantoniniy and Aleksandar Zaklan, 'The European Union Emissions Trading System: Ten Years and Counting' (2016) 10(1) *Review of Environmental Economics and Policy* 89; Bram Borkent, Alyssa Gilbert, Erik Klaassen, Maarten Neelis and Kornelis Blok, 'Dynamic Allocation for the EU Emissions Trading System Final Report' (2014).

[42] Mark Miner, 'Neural Energy Consulting' (5 September 2011), http://web.archive.org/web/20181003160557/www.neuralenergy.info/2011/06/pricing-carbon.html; European Parliament and European Council, Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, Art 3(j) (Directive 2003/87/EC).

[43] European Parliament and European Council, Directive 2003/87/EC, Art 3(j).

[44] Ibid Art 6.

company can be easily and accurately measured by detectors installed on its properties, facilitating the computation of the MMTCDE emitted by each company.[45]

Finally, the EU ETS meets the condition of having a tax base that is proportional to the size of the externality. Since the warming effect for each MMTCDE emitted is a scientifically-knowable physical fact, the total contribution of a company's emissions to climate change can be obtained simply by multiplying this warming effect by the amount emitted in terms of MMTCDEs. Hence, the final condition is fulfilled, as the tax base as measured in terms of MMTCDEs is proportional to the externality of climate change generated by each company.

The ability of the EU ETS to meet the conditions for an efficient Pigouvian tax demonstrates its potential to effectively address negative externalities by improving both allocative and distributive efficiency. This makes emissions pricing a promising model, at least in theory, for tackling the negative externality of job displacement that is associated with automation. Through the allocative mechanism, the automation tax could reduce or slow the displacement of workers by automation. Through the distributive mechanism, the automation tax could generate revenue to support and reskill workers that are displaced by automation.

5. DESIGN AND IMPLEMENTATION CHALLENGES FOR AN AUTOMATION TAX

Automation taxes could be designed and implemented based on the emissions pricing model. Under such a model, the actual or potential employment-displacing effects of automation would serve as the base for an automation tax, analogous to emissions pricing systems which use the actual or potential warming effects of greenhouse gases as the tax base. Subsequently, companies would pay a constant amount of tax for each unit of the tax base.

The key design and implementation challenge for an automation tax that is based on the emissions pricing model is the difficulty in identifying an appropriate tax base. An appropriate tax base should meet the three abovementioned conditions of quantifiability, measurability and proportionality: it should be quantifiable in terms of a common unit, it must be feasible in practice to measure the size of the tax base in terms of this common unit, and the tax base as quantified in terms of this unit should be proportional to the size of the externality. If these conditions are not fulfilled, the automation tax may not be practically enforceable. It may also fail to be theoretically efficient, as the size of the tax payable by each agent would not be proportional to the size of the externality generated by that agent.

5.1 The main difference between the cases of automation and emissions

Crucially, an automation tax may differ from that of an emissions pricing scheme in that it has the potential to be counterproductive because the employment-substituting effects of automation are directly opposed to its employment-complementing effects. In other words, while it is certain that an emissions pricing scheme will at least to some extent accomplish its objective of mitigating climate change, it is unclear if the net effect of an

[45] Mirabelle Muûls, Jonathan Colmer, Ralf Martin and Ulrich Wagner, 'Evaluating the EU Emissions Trading System: Take It or Leave It? An Assessment of the Data after Ten Years' (Grantham Institute Briefing Paper No 21, October 2016); European Commission, 'The Monitoring and Reporting Regulation – Guidance on Sampling and Analysis', MRR Guidance Document No 5 (2017).

automation tax will be to decrease or increase employment in automation-intensive industries.

Hence, unlike emissions pricing schemes that are theoretically effective as a means of tackling climate change, an automation tax could suffer from serious theoretical flaws. An automation tax adopted according to the emissions pricing model assumes that automation will inevitably result in the displacement of employment, and therefore generate an externality that must be remedied through a Pigouvian tax. As our discussion in section 3 above shows, however, automation is not purely a substitute for labour. Like other forms of capital or other productivity improvements, it may have employment-complementing or employment-substituting effects. This is unlike the case of greenhouse gases, which have an unambiguously negative effect on the environment.[46]

5.2 Theoretical challenges

An automation tax, unlike an emissions pricing regime, may not be theoretically optimal due to the adverse social and economic impacts of such a tax. These adverse impacts are especially significant in open economies that are highly exposed to global competition in technology, trade and investment.

5.2.1 The cost to technological competitiveness

The first of these adverse impacts is that an automation tax threatens to undermine the economy's technological competitiveness. The rapid growth and potential size of the technology sector has resulted in intense global competition for leadership in the development and production of various automation-related technologies, such as artificial intelligence and robotics.[47] The importance of rapidly assuming leadership in automation development and production is magnified by two facts: first, technological dominance can translate into broader economic dominance, as automation-related goods and solutions are likely to be widely embedded in the production and consumption of goods and services across all sectors;[48] second, players that assume early leadership in the automation sector have the opportunity to entrench their dominant positions with their outsize influence over the development of global technology standards.[49]

An automation tax could undermine an economy's efforts at assuming this leadership position and strengthening its technology sector in two ways. First, the technology sector is likely to be disproportionately affected by an automation tax, due to the high degree of automation technology used in the development and production of automation technology itself. Secondly, even if the technology sector is exempted from an automation tax, such an automation tax would result in the loss of industrial users of automation technology and the loss of labour with automation-related skills in other sectors of the economy. As a critical mass of both skilled talent and industrial partners

[46] Though it is noted that it still may benefit less developed countries to use fossil fuels, at least in the short term.
[47] Emanuel Gasteiger and Klaus Prettner, 'A Note on Automation, Stagnation, and the Implications of a Robot Tax' (Free University Berlin School of Business and Economics Discussion Paper, 2017) 2; Jan Fagerberg, 'Technology and Competitiveness' (1996) 12(3) *Oxford Review of Economic Policy* 39, 48-49.
[48] Richard Heeks and Carolyne Stanforth, 'Technological Change in Developing Countries: Opening the Black Box of Process Using Actor–Network Theory' (2015) 2(1) *Development Studies Research* 33, 34; Fagerberg, above n 47, 48-49.
[49] Fagerberg, above n 47, 48-49.

is crucial for nurturing a budding automation production and development industry, an automation tax that obstructs the formation of this critical mass also poses an obstacle to the development of the economy's technology sector.

Beyond the longer-term effect on the growth and development of technology sector, however, there are more immediate costs to the wider economy. First, the allocative effect of an automation tax will undermine the economy's trade competitiveness in non-technology sectors. By raising the productivity of the production process and reducing labour costs, automation contributes to a reduced cost of production for goods of similar type and quality, making these goods more competitive in global markets. If companies were to reduce their use of automation due to the allocative effects an automation tax, the economy would forgo the export-boosting benefits of automation. These benefits are particularly large for the developed economies that are the focus of this article: their greater ability to adopt automation technology allows them to compensate for their higher labour costs by raising labour productivity and reducing production costs, allowing them to retain trade competitiveness and by extension employment opportunities in automation-intensive sectors.[50]

Secondly, the distributive effect of an automation tax will undermine the economy's competitiveness for investment and production in non-technology sectors. As globalisation has made it possible for large multinational corporations (MNCs) to shift production and investment to economies with the lowest costs and greatest returns, competition among economies for the limited global pie of investment and production is intensifying.[51] If the potential returns of MNCs investing in a given economy were to be reduced due to the distributive effects of an automation tax, its competitors would become relatively more attractive as destinations for investment and production. All things equal, this would shrink the economic output of, as well as the medium-term supply of employment opportunities available within, that economy. This is a concept common to taxes necessarily imposed on externalities but not uniformly implemented across different jurisdictions. It is comparable to the concept of 'leakage' often discussed in the context of carbon taxes, which will also be discussed later.

These adverse impacts on the output and supply of job opportunities are likely to be particularly acute in automation-intensive sectors – sectors in which the use of automation contributes significantly to output and productivity, and in which companies are likely to make investment and production decisions based on an economy's openness to the use of automation. The adverse economic impact of an automation tax is likely to be magnified by the importance of these automation-intensive sectors to developed economies as these are likely to be sectors that are high-value and highly productive, in addition to being the sectors in which developed economies are likely to have a comparative advantage.

More significantly, the fact that the negative effects of an automation tax are likely to be concentrated in automation-intensive sectors implies that an automation tax could be highly counterproductive. The intent of an automation tax, after all, is to mitigate the effect of automation in displacing workers, especially in automation-intensive

[50] Ryan Abbott and Bret Bogenschneider, 'Should Robots Pay Taxes? Tax Policy in the Age of Automation' (2018) 12(1) *Harvard Law and Policy Review* 145, 153-156.
[51] Ibid 32; UNCTAD, 'Globalization, Competition, Competitiveness and Development' (High-level Segment of the 44th Session of the Trade and Development Board, 23 October 1997) 2.

industries. While such an automation tax may serve as a direct remedy by slowing the pace of automation or by raising funds to support affected workers, it may also indirectly exacerbate the underlying problem by undermining the price competitiveness of their output and the creation of job opportunities in their sectors. In other words, automation is a double-edged sword for workers in automation-intensive industries: it threatens to displace their labour but compensates by safeguarding them from external competition for their output and their jobs. Automation can be both employment-substituting and employment-complementing; in attempting to address the costs of the former, an automation tax may force society to forgo the sizeable benefits of the latter.

5.3 Other models for automation taxation

Several other commentators have proposed a variety of other models for automation taxation.[52] These include proposals such as a tax on the notional salary earned by a 'robot',[53] a performance-related levy or a sectoral or industry tax,[54] or an insurance plan, sovereign wealth fund or a Universal Basic Dividend.[55] There is a strong case for equipping governments with as many policy tools as possible and indeed, many of these proposals may be beneficially implemented depending on the different labour market conditions in various jurisdictions. The argument for the form of automation tax proposed in this article does not in any way challenge the viability of the other proposals raised in the existing academic literature.

This article does submit, however, that it is possible to create a framework for assessing models for automation taxation. Such a framework should meet the three abovementioned conditions of quantifiability, measurability and proportionality in order to be effective.

5.4 Framework for assessing automation taxation models

We will explore whether the possible tax bases for an automation tax meet all of the above three conditions. We will do so by grouping the wide range of possible tax bases into two categories. The first category is outcome-related tax bases, under which companies are taxed according to the actual outcome, in terms of employment or job displacement, of the automation that they have implemented. Tax bases in this first category seek to quantify the actual employment-displacing effects of automation.[56]

The second category is that of action-related tax bases, under which companies are taxed according to the extent or type of the automation that they have implemented – in other words, the intensity of automation. Tax bases in this second category seek to quantify

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[52] For an excellent summary of these other models, see McCredie et al, above n 18, 651-652 and 655-658. Also see Abbott and Bogenschneider, above n 50, 168-169.

[53] McCredie et al, above n 18, 651, citing Xavier Oberson, 'Taxing Robots? From the Emergence of an Electronic Ability to Pay to a Tax on Robots or the Use of Robots' (2017) 9(2) *World Tax Journal* 247, 254-255.

[54] McCredie et al, above n 18, 651, citing Charles Orton-Jones, 'The Complication of Taxing Robots', *Raconteur* (23 February 2018), https://www.raconteur.net/manufacturing/complication-taxing-robots (accessed 26 November 2021).

[55] McCredie et al, above n 18, 651, citing Valentine Vishnevsky and Viktoriia Chekina, 'Robot vs. Tax Inspector or How the Fourth Industrial Revolution Will Change the Tax System: A Review of Problems and Solutions' (2018) 4(1) *Journal of Tax Reform* 6.

[56] Oberson, above n 53.

the potential employment-displacing effects of automation based on the intensity of automation implemented.[57]

Overall, we will argue that no tax base in either category meets all three of the conditions of quantifiability, measurability, and proportionality. The lack of an appropriate tax base from either category poses a significant design and implementation challenge for an automation tax based on the emissions pricing model.

5.4.1 Outcome-related tax bases

The most direct approach to determining the size of the externality is to determine the number of workers retrenched due to the implementation of automation within a firm. Abbott and Bogenschneider argue that this approach is conceptually similar to existing systems where employers are taxed, in the form of payments into unemployment insurance schemes, based on the number of workers that have been retrenched from their firms.[58] Some modifications could suffice to transform this existing system into an automation tax. For instance, tax authorities could determine the extent to which each firm's layoffs can be attributed to automation, and then accordingly adjust the amount each firm contributes in unemployment insurance payments.

Tax bases in this outcome-related category could, in theory, meet the three conditions of quantifiability, measurability and proportionality. The tax base could be quantified in terms of either the number of layoffs, or the total monetary extent of any reduction in worker wages. It would also be easily measurable based on the financial data, payrolls, or other internal records of companies. If layoffs could be accurately attributed to automation instead of other causes, the condition of proportionality would also be met; the size of the tax base, as measured in terms of layoffs attributable to automation, would be proportional to the extent of externality of automation-induced job displacement.

The main challenge for outcome-related tax bases lies in the difficulty of determining if layoffs should be attributed to automation instead of other possible causes such as poor business conditions or productivity improvements unrelated to automation. One potential approach for establishing a *prima facie* causal relationship between automation and layoffs is to use a multi-pronged test to determine if the displaced employee was substituted with automation. This test could include elements such as whether the period of time between automation and the layoff was sufficiently short and whether the tasks automated were sufficiently similar to the tasks performed by the displaced employee. The presence of all elements in this test could form the basis for a presumption that the layoffs in a given case were attributable to automation.

The interpretation and application of such a test, however, would pose significant practical challenges due to the level of technical expertise and industry knowledge required to determine, for instance, whether the tasks automated were sufficiently similar to that performed by the displaced employee. Given the widespread extent of automation, it is unlikely that tax authorities would possess the requisite expert capabilities to an extent sufficient to cope with the likely volume of cases. More importantly, the presumptive nature of this approach runs the risk of overestimating the extent of layoffs attributable to automation. Should other layoff-inducing factors such as a downturn or productivity improvements coincide with the implementation of

[57] Ibid 256-257.
[58] Abbott and Bogenschneider, above n 50, 170.

automation, the layoffs caused by these other factors may mistakenly be attributed to the impact of automation. This problem may be addressed by removing the presumption when other layoff-inducing factors are present, but this opens the possibility for firms to disguise the employment-displacing effects of automation by implementing such automation in a manner that coincides with a downturn or with the implementation of other productivity improvements. Overall, the approach of using such a test may work well in a limited number of situations, such as the replacement of truck drivers with self-driving trucks, where the relationship between automation and employee displacement is evident. In the overwhelming majority of cases, however, where automation bears a more complex relationship with employment, this test runs the risk of being either too strict or too lenient.

An alternative to determining the number of workers retrenched due to automation is to use capital, labour or profit ratios as the tax base for the automation tax. This alternative falls within the outcome-related category of tax bases because these capital, labour and profit ratios are observable outcomes of a firm's employment and automation decisions, and because these ratios could be indicative of the employment-displacing effect of automation implemented within a firm. To illustrate, high capital-profit or capital-revenue ratios indicate that a firm uses significant amounts of capital, which could come at the expense of employing labour. Conversely, low labour-profit or labour-revenue ratios indicate that a firm uses relatively little labour to generate sales or profits, which might imply the substitution of capital for labour. To determine whether a firm has capital ratios that are too high or labour ratios that are too low, tax authorities could compare the firm's present capital or labour ratios either to its own capital or labour ratios in previous periods, or to the capital or labour ratios of other firms in the same sector.

Both alternatives have their drawbacks. The former method of comparing a firm's present capital and labour ratios to its own past ratios does not account for inherent differences in the capital-intensiveness or profitability of different industries. For instance, automobile manufacturing is an inherently more capital-intensive industry than hospitality and tourism, while firms in the information technology sector tend to enjoy significantly larger profit margins than firms in retail. Consequently, it gives insufficient credit to firms that have consistently created more employment opportunities than other companies in the same industry. In contrast, the latter method of comparing the firm's capital and labour ratios to that of its peers in the same industry does not account for the way firms have changed over time.

Overall, it is not clear that outcome-related tax bases, while promising in their attempt to directly determine the size of the externality of automation-induced job displacement, can overcome the crucial challenge of determining if observed employment outcomes should be attributed to automation or to other layoff-inducing factors. Crucially, the relationship between observed employment outcomes and automation is too complex and contestable, making it difficult for tax authorities to make judgments on attributability that are both sufficiently efficient to cope with the high volume of cases and sufficiently accurate to achieve the desired economic effects of the automation tax.

In other words, the condition of proportionality can only be fulfilled, if at all, at the expense of the condition of measurability. The upshot is that none of the possible outcome-related tax bases can meet all three of the conditions for the optimal design of an automation tax.

5.4.2 Action-related tax bases

Instead of relying on observable employment outcomes, tax authorities could use the extent or type of automation implemented, in other words the overall intensity of automation, as a proxy for the employment-displacing impact of automation. For this approach to succeed, the same three conditions must be met: what is meant by the 'intensity of automation' would have to be specified in terms of quantifiable units, it must be feasible to measure the intensity of automation in terms of these quantifiable units, and the intensity of automation as measured using this quantifiable unit should be proportional to the employment-displacing impact of automation, and by extension the size of the externality.

The first condition is best fulfilled by using the value added by automation as the quantifier for the intensity of automation. Since the intensity of automation is intended to reflect the extent to which the firm relies on automation, as opposed to labour, to perform value-generating tasks, it makes sense for the intensity of automation to be quantified in a way that captures the total sum of such tasks that are performed by the firm, or the total amount of work performed using automation. When summing these tasks, each task should not carry equal weight, as tasks vary in terms of their importance to the firm. Instead, the sum should be weighted based on the value of each task. This sum of the value of automated tasks is conceptually equivalent to the total value added by automation. Furthermore, if it holds true that automated tasks could have been performed equally well by human labour, then the value added by automation in performing these tasks is indicative of the value of the human labour that could have been employed in place of automation, and therefore furthermore indicative of the employment-substituting effect of automation.

Indeed, using the value added by automation as a quantifier is superior to alternative means of quantifying the intensity of automation. The cost of automation equipment, for instance, is a poor proxy for the intensity of automation. One reason is that the cost of the non-autonomous components of automation equipment may contribute disproportionately to the overall cost of the equipment. For instance, a self-driving vehicle may only be slightly more expensive than a comparable conventional vehicle, because the cost of its autonomous components and software makes up only a fraction of the car's total cost. In this case, it seems inappropriate that the entire cost of the car should be taxable. Even if the tax base included only the cost of the automation-related components of equipment, this cost is a poor reflection of the extent to which tasks have been automated by this piece of equipment. Expensive equipment may not necessarily have greater capabilities or contribute to the automation of more tasks; indeed, while physical capital tends to have a constant and significant cost per marginal unit of output, the scalability and low marginal cost of automation technologies such as algorithms mean that the impact of these technologies is decoupled from their cost.[59] The upshot is that automation taxes ought not take a form similar to that of a sales tax, since that would entail using the cost of automation as a tax base.

Another alternative way to quantify the intensity of automation is to determine the potential capabilities of automation systems and equipment purchased by a firm. Should a firm invest in automation systems and equipment that have significant capabilities or

[59] Paul Romer, 'Capital, Labor, and Productivity' (1990) *Brookings Papers on Economic Activity: Microeconomics* 337, 339; Melrose and Tilley, above n 10.

that are able to perform a significant proportion of the tasks involved in the production process, it is reasonable to assume that they are automating to an intensive degree. To facilitate comparisons between systems and equipment with different capabilities, technical experts could estimate the amount of human labour that could be replaced by automation systems or equipment with a particular feature or a particular category of automation system or equipment. The tax base could then be computed by adding up the estimated quantity of human labour that could be replaced by each individual system or piece of equipment, so as to obtain the total amount of human labour that could be replaced by the potential capabilities of the entirety of a firm's automation systems or equipment. However, this capability-based approach of quantifying the intensity of automation suffers from a problem similar to that of the cost-based approach discussed above. Automation systems and equipment with greater capabilities have greater potential for performing tasks, but the actual scale of the tasks performed by automation may not be as significant as the full potential of such automation. Again, the impact of automation depends not only on the intrinsic capabilities of the equipment or systems used, but also on the size of demand for the goods and services that are produced through automation. In the context of automation, the capabilities of equipment or systems give a sense of what types of tasks they can perform, but may not necessarily shed light on the scale or significance of these tasks. The value added by automation remains superior to alternatives, such as the cost or capabilities of automation systems and equipment, for quantifying the intensity of automation.

Having shown that the value added by automation is the best available means of quantifying the intensity of automation, we will now examine if the value added by automation is easily measurable and observable. Here, we run into a problem similar to that faced by outcome-related tax bases: the problem of attributing outcomes, such as employment outcomes in the previous case or value added in this case, to automation as opposed to other factors that might also be causally related to these outcomes. While it is possible to determine the change in the profitability or output of a firm following an instance of automation, it is incorrect to assume that this change in value added is entirely attributable to automation. Any observed change might have been caused, for instance, by process changes that were unrelated to and introduced at the same time as the implementation of automation. Furthermore, the value added by automation depends significantly on the synergies between automation and other inputs or changes such as capital, skilled labour or improvements to business processes. The presence of these synergies precludes a neat decomposition or partition of the total output of a firm into the separate contributions or value added by individual inputs such as automation and labour. The upshot is that the value added by automation is in practice difficult to measure or determine.

The value added by automation fails not only the second condition of being measurable but also the third condition of being strongly correlated with the employment-displacing effects of such automation. The key assumption that is required for this final condition to be fulfilled is that the value added by automation could have been value added by labour. This assumption does not hold in all instances of automation. For example, the value created by Internet search engine algorithms is value added by automation that could not have been achieved with the use of human labour alone, due to the infeasibility of making humans search manually through millions of webpages. Similarly, the value added by automated precision manufacturing tools lies in the ability to achieve a level of accuracy and reliability that would be impossible with human labour. Including these instances of value added by automation in the tax base for an automation tax has two

implications: first, the desired outcome of ameliorating worker displacement is not achieved, as human labour cannot be used as a substitute for automation in these cases; second, as these forms of automation provide benefits to society that could not otherwise be achieved, there is an economic loss to society as the use or development of such automation is penalised.

To summarise the discussion above, the intensity of automation meets only one of the three conditions that are necessary for it to serve as an appropriate tax base for an automation tax. While it can be quantified in terms of the value added by automation, this value added cannot easily be measured and does not correlate well with the size of the externality, making it a poor tax base both in terms of practical enforcement as well as in terms of theoretical efficiency.

6. PROPOSAL: REVERSE DEPRECIATION

We propose that an automation tax could be implemented by building on the existing system of depreciation/capital allowances. Instead of a blanket deduction for capital investment, we suggest that the deductibility of capital investments should vary depending on the effect of the capital investment on employment. More specifically, companies that invest heavily in employment-complementing capital will be allowed to deduct a greater proportion of their capital expenditure from their taxable income, while companies that invest more heavily in employment-substituting capital will only be allowed to deduct a smaller proportion of their capital expenditure. We have chosen this approach for several reasons.

This reform directly tackles the need to rebalance existing capital investment incentives for companies. The existing capital allowances system gives companies a blanket incentive to invest in capital, regardless of whether this capital is employment-substituting or employment-complementing. While such a blanket deduction may have been appropriate in a context where new and better employment opportunities were continuously being generated, it is no longer appropriate in the present context where the rate of automation-induced job displacement may potentially exceed the rate at which new job opportunities are created. By targeting capital allowances, this reform ensures that employment-complementing capital investments will be favoured over employment-substituting ones.

This reform further tackles the need to expand the revenue base so that the government has sufficient funds to support the growing number of displaced workers. By reducing the deductibility of capital expenditure for a subset of companies, the government can raise more corporate tax revenue without an increase in the headline rates of existing taxes.

Overall, reforming the existing system of capital allowances corrects the imbalances of the existing system and also expands the revenue base to address the increased need for government support of displaced workers. We will now suggest several reasons why targeting capital allowances is superior to alternative means of achieving these two goals of rebalancing incentives and raising revenue.

First, as the additional revenue raised by our proposed reform is generated by reducing the tax deductibility of some capital investments, the additional tax burden is imposed only on profit-making companies. In contrast, alternatives such as an automation tax or a tax on the capital-profit ratio impose an additional tax burden on both profit-making

and loss-making companies. The effect of the latter is to increase the pressure on struggling companies and make it more difficult for them to invest in automation as a means of staying afloat. While this may achieve the intended effect of reducing overall levels of investment into employment-substituting capital, it has the unintended and more significant effect of reducing the competitiveness of local firms *vis-à-vis* their international competitors. In turn, this may result in greater job losses as uncompetitive domestic firms are forced to shut down or relocate in the face of external competition. This problem can be avoided by ensuring that only profit-making firms – firms that are able to generate profits even in the face of competition – are subject to the increased tax burden. Revising the existing system of capital allowances accomplishes this goal. While there may be concerns that reducing the amount of deductions for certain types of capital puts companies with lower profit margins at a disadvantage, such a scheme encourages companies with smaller profit margins to invest in employment-complementing capital. Ultimately, this will serve to minimise the impact of automation on worker displacement.

Second, the enforceability of this proposal is superior to that of imposing a completely new tax. While companies can avoid a direct tax on automation by concealing their investments into automation, there is no similar means of avoidance for a policy that removes the tax deductibility of some capital investments. Furthermore, there is already a well-established enforcement and administrative mechanism for the existing system of capital allowances, as well as a significant body of case law. Piggybacking on this solid foundation avoids the inefficiency and disruption that would result from the establishment of an entirely new enforcement and administrative mechanism for a new tax.

Finally, this proposal contributes to increasing the overall productivity of the economy, which is necessary to allow domestic industries to face the threat of external and low-cost competition. It continues to preserve the deductibility of capital expenditure if such expenditure complements labour, so companies continue to have an incentive to raise worker productivity by investing in capital. Furthermore, unlike a blanket excise tax on technology or capital or a tax on companies with high capital-profit ratios, it does not distort the market by placing a greater tax burden on companies in capital intensive industries. Instead, companies in these industries can continue to enjoy the existing tax benefits of capital investment, so long as they ensure that their capital investments are enhanced but do not displace existing job opportunities.

Our proposal of making adjustments to the deductibility of capital expenditure in order to achieve a policy objective – in this case the attenuation of the effects of automation on employment – is not without precedent. Depreciation rates have been accelerated to stimulate investment during recessions,[60] and bonus capital allowances were granted to companies in the *Job Creation and Worker Assistance Act of 2002* enacted by the United States Congress in the wake of the September 11 attacks.[61] These precedents suggest

[60] Christopher House and Matthew Shapiro, 'Temporary Investment Tax Incentives: Theory with Evidence from Bonus Depreciation' (2008) 98(3) *American Economic Review* 737; John Kitchen and Matthew Knittel, 'Business Use of Section 179 Expensing and Bonus Depreciation, 2002-2014' (US Treasury Office of Tax Analysis Working Paper 110, October 2016) 5.

[61] *Job Creation and Worker Assistance Act of 2002* (Pub. L. 107-147, 116 Stat. 21); Kitchen and Knittel, above n 60, 5.

that it is feasible and legally justifiable to use capital allowances as a policy instrument to achieve economic goals.

6.1 Potential concerns with reverse depreciation as an automation tax[62]

It is necessary to ensure that the theoretical basis of reverse depreciation as an automation tax is sound. As discussed above, this automation tax is largely based on a Pigouvian tax model that is a well-established method of correcting market failure arising from externalities. It relies on the principle that the creator of the externalities should bear the relevant costs and in so doing, internalise the externalities. At a higher level of abstraction, since this model is based on the need to correct market failure, its foundations are rooted in utilitarianism.[63]

There is a *prima facie* need to justify a departure from the use of fair value accounting, since this may potentially affect the accuracy of the reporting of the financial positions of companies. However, it is noted that current accounting and tax systems are sufficiently capable of dealing with such issues, given that the concept of bonus depreciation is a well-established one with many precedents across various jurisdictions. This proposal is perhaps only novel to the extent that it recommends depreciation that can be 'negative' as well as 'positive'.

There may be issues of equity or fairness given that this proposal recommends that the automation tax may be applied to a subset of industries or entities. This is an issue for the policy-maker to consider and ensure that any policy adopted is defensible. Ultimately, this automation tax is only a tool that has to be applied in a rational manner. However, it is noted that tax policy has long accepted that some taxes are intentionally designed to create distortionary behaviour and, thus, will naturally affect those whose behaviour it is designed to change more than others. This is justifiable and not an instance of unfair discrimination so long as the overall policy can be reasonably defended.

Finally, there is the question of how much additional taxes can be raised through the adoption of this automation tax. This is a complex issue that will depend considerably on the precise circumstances of the jurisdiction seeking to implement it, the global conditions, state of technological development and the relevant industries in question. What we can show at this point is that similar models of adjusting depreciation have been implemented on a large number of prior occasions and are feasible and legally justifiable.[64] We hope that our proposal can encourage further research in this area, ultimately in the form of economic modelling at the industry, jurisdiction and global levels.

6.2 A complex problem

The function of the automation tax is as a policy tool for the government to control the rate at which automation displaces human workers. Given that automation is doing so in a myriad of different ways and in unpredictable and perhaps unimaginable ways, the

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[62] We are very grateful to the anonymous referee for highlighting these concerns and suggesting that we should address them in our article.
[63] For an in-depth analysis of utilitarianism (and other concepts) as a basis for taxing automation, see McCredie et al, above n 18, 652-655.
[64] See nn 60 and 61, above.

ideal robot tax would have to be complex enough to apply in all these different ways, and flexible enough to keep up with the rapid developments in automation technology. The demand for a system that works in precisely such a way is not new. Tax authorities around the world have long realised the inadequacies of general tax rules:[65] draft them too broadly and there is no taxpayer certainty; draft them too narrowly and risk the loss of tax revenue.[66] The solution was found to lie in the use of comprehensive schedules supported by general tax principles; each item on the schedule could be accorded different tax treatment depending on the governmental policy at the time.[67] Such a system was applied to the tax treatment of assets acquired for use in businesses. The use of such systems diverged over time, with the United States labelling the concept 'depreciation of assets' and the United Kingdom calling it 'capital allowances'. This section explores the mechanism of 'depreciation', which has been used to provide tax incentives and disincentives arguably since 1878.[68] It will argue that the schedular system used by depreciation is extraordinarily well suited for controlling the rate at which automation displaces human workers.

6.3 The concept of depreciation

The fundamental concept of depreciation is simple enough to grasp. A firm which invests in new capital for its business incurs an expense. However, most tax authorities do not allow the firm to deduct the full cost of the asset as an expense immediately as the firm still possesses the asset, which will continue to have value until the end of its working life. Thus, for tax accounting purposes, the firm must deduct the expense on a periodic basis, generally mirroring the gradual decrease in value of the asset until it becomes worthless.[69]

6.3.1 The United Kingdom (capital allowances)

The United Kingdom concept of capital allowances has a major conceptual difference from that of depreciation, the adoption of which it has continuously rejected.[70] Strictly speaking, the English tax system draws a distinction between revenue expenditure and capital expenditure. While revenue expenditure may be deductible in computing the profits of a trade, capital expenditure is not. It has been suggested that the reason why the English tax system did not initially have a system for recognising capital expenditure is because income tax was thought to be only temporary.[71] An outright refusal to recognise the gradual depreciation in the value of capital assets renders the calculation of the true amount of profits earned from trade inaccurate. Expenditures of capital assets are a cost of doing business in much the same way as revenue expenditures are.[72]

Another effect of disallowing the deduction of capital expenditure is that it has a distortionary effect on the market, disadvantaging capital-intensive businesses. Yet there is no good reason why capital-intensive businesses should suffer as such. The great

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[65] Victor Thuronyi, 'Drafting Tax Legislation' in Victor Thuronyi (ed), *Tax Law Design and Drafting, Vol 1* (International Monetary Fund, 1996) 71; Surrey, above n 33.
[66] Thuronyi, above n 65; Surrey, above n 33.
[67] Thuronyi, above n 65; Surrey, above n 33; Slemrod and Gillitzer, above n 38, 7.
[68] Dominic de Cogan, 'Purposive Interpretation in the Age of Horse Trams' [2015] 1 *British Tax Review* 80, 81.
[69] House and Shapiro, above n 60, 744.
[70] Glen Loutzenhiser, *Tiley's Revenue Law* (Bloomsbury Publishing, 9th ed, 2019) para 6.1.3.
[71] Ibid, para 6.1.1.
[72] Ibid, para 6.12.1.

importance of such capital-intensive businesses eventually led to the implementation of various schemes to recognise the true costs of capital expenditure.[73] The most extensive and established scheme is the capital allowance system,[74] which broadly functions in a similar manner to the Modified Accelerated Cost Recovery System in the United States described below.

6.3.2 The United States (depreciation)

In the United States, depreciation follows the specifications of the Modified Accelerated Cost Recovery System (MACRS), which contains comprehensive schedules of the rates at which specified assets or classes of assets may be depreciated.[75] While there are multiple methods for calculating the rates of depreciation under MACRS, the most common method is the 'declining balance method',[76] which allows for faster depreciation when the asset is initially purchased, with the rate of depreciation relative to the cost price of the asset declining over time.[77]

6.4 A schedular system

Both MACRS and the capital allowance system are highly prescriptive, relying heavily on comprehensive schedules of assets which provide for differing tax treatment of the various assets or classes of assets. This is done to keep the system reasonably simple,[78] for it would be a nearly impossible task to attempt to estimate the exact depreciation in value of each and every asset being claimed by taxpayers. The schedular system has provided particular advantages in terms of flexibility of economic policy. Where the government wished to introduce a particular adjustment to the rate of depreciation, instead of changing the general taxing provision or specially enacting a separate section, it was able to simply change the rate for a particular asset or class of assets in the schedule. In this way, a very flexible system could be created where the government could provide incentives for very specific classes of capital assets depending on what economic policy required.

6.5 Two dimensions of adjustments

While the primary function of MACRS is to reflect the true costs of doing business, it has been used on multiple occasions to provide firms with an incentive to engage in certain activities. The prescriptive nature of the system, with its extensive schedules make it possible to single out particular activities for special tax treatment. There are two main dimensions by which the standard declining balance method may be adjusted to produce intended distortionary effects: 1) accelerated depreciation, and 2) bonus depreciation.

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[73] Michael Sherry, *Whiteman & Sherry on Income Tax* (Sweet and Maxwell, 4th ed, 2016) para 9.001.
[74] Loutzenhiser, above n 70, para 6.1.1.
[75] House and Shapiro, above n 60, 744-745.
[76] Douglas Kahn, 'A Proposed Replacement of the Tax Expenditure Concept and a Different Perspective on Accelerated Depreciation' (2013) 41(1) *Florida State University Law Review* 143, 153.
[77] House and Shapiro, above n 60, 744-745.
[78] Royal Commission on Taxation, Canada (Kenneth LeM Carter, chair), *Report of the Royal Commission on Taxation, Volume 4*: *Taxation of Income (Continued)* (1966) 237-238.

6.5.1 Accelerated depreciation

Accelerated depreciation is the allowance of deductions for declines in the value of an asset at higher rates than are expected to occur in practice.[79] Conceptually, the total amount of tax deductions attributable to the capital expenditure does not change. Instead, the deductions are brought forward so that they can be made earlier.[80] In effect, the taxpayer receives an interest-free loan from the government, equivalent to the amount of tax deferred as a result of the early deduction.[81] Apart from the interest-free loan from the government, accelerated depreciation also offers firms several other benefits. First, as the value of money decreases over time due to inflation, the ability to defer one's taxes raises the net present value of the capital asset,[82] since the deduction is claimed in present dollars rather than in future dollars (which are worth less).[83]

Second, while future tax deductions are uncertain since they may be affected by a variety of unexpected factors, claiming the deductions immediately locks in the effect of the tax deductions, reducing the risk for the business.[84] Third, the early deduction of capital expenditure provides cash flow benefits, giving the firm more liquid cash and allowing the asset to break even at a faster rate.[85] Finally, accelerated depreciation provides an important source of funds to firms and reduces the need to obtain external financing.[86] Presently both the US MACRS and the UK capital allowances system have default depreciation rates that are accelerated.[87] Nevertheless, the depreciation rates are frequently further accelerated to achieve economic objectives, particularly to stimulate capital investment during times of recession.[88]

6.5.2 Bonus depreciation

For prescribed categories of capital expenditure, the taxpayer is allowed to deduct more than 100 per cent of the cost of the capital asset. Bonus depreciation is often combined with accelerated depreciation, though it can be effective as a standalone policy. Congress did provide for bonus depreciation in the *Job Creation and Worker Assistance Act of 2002*, where companies were allowed to deduct 30 per cent of the cost of eligible assets before the standard depreciation method was applied.[89] The rate for assets purchased over a certain duration increased to 50 per cent with the passage of the *Jobs and Growth Tax Relief Reconciliation Act 2003*. This 50 per cent depreciation incentive was reintroduced through the 2008 *Economic Stimulus Act* and extended again via the 2015 *Protecting Americans From Tax Hikes Act* (PATH Act). In 2017, the *Tax Cuts*

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[79] Review of Business Taxation, Australia (John Ralph, chair), *A Platform for Consultation: Discussion Paper 2, Building on a Strong Foundation* (1999) vol 1, 117.
[80] Ibid.
[81] Andrew Harper, 'Finance Act Notes: Annual Investment Allowance, etc- Sections 74-76 and Schedule 24' [2008] 5 *British Tax Review* 480, 483; Andrew Harper, 'Finance Act Notes: Section 24 – First-Year Capital Allowances for Expenditure in 2009-2010' [2009] 5 *British Tax Review* 505, 507.
[82] Rebecca Morrow, 'Accelerating Depreciation in Recession' (2016) 19(8) *Florida Tax Review* 465, 472, citing Christopher Hanna, 'Tax Theories and Tax Reform' (2006) 59(2) *SMU Law Review* 435, 441.
[83] Morrow, above n 82, 469.
[84] Ibid 472.
[85] Review of Business Taxation, above n 79, vol 1, 117.
[86] Royal Commission on Taxation, Canada (Kenneth LeM Carter, chair), *Report of the Royal Commission on Taxation, Volume 6*: *Implications of the Proposed Tax Reforms* (1966) 92.
[87] Ibid.
[88] Morrow, above n 82, 473.
[89] Ibid 481.

and Jobs Act further raised the rate to 100 per cent for qualified property, as defined by the Internal Revenue Service.[90]

6.6 Assessing the two dimensions

6.6.1 Assessing accelerated depreciation

If accelerated depreciation can give taxpayers considerable benefits, it follows that there must be a cost to the government. These costs largely mirror the benefits that the taxpayer receives. The most obvious cost is the '"interest" on this "loan" less any revenue from taxation of the extra income earned by the taxpayer as a result of the "loan"',[91] after factoring in the decrease in the value of money due to inflation. The government also bears a 'certainty risk', since there is no guarantee that the firm will still be in business when it is time to collect the deferred taxes. However, the sheer number of taxpayers in a jurisdiction creates very efficient spreading of the risk, putting the government in the strongest position to bear such a risk. Unless a government has a persistent and major fiscal deficit, the benefits to the taxpayer in terms of cash flow and availability of funds outweigh the cost to the government.[92]

It is noted that accelerated depreciation means that in the early years where capital assets are purchased, the government will suffer revenue losses, which will be recovered in later years. This effect can be very large indeed if the expenditure on capital assets as a society constantly increases, as would be expected in a growing economy.[93] This may result in a budget deficit if the government does not estimate the effect of accelerated depreciation accurately.

6.6.2 Assessing bonus depreciation

By allowing a deduction greater than the cost of a capital asset, the government is essentially collecting less tax revenue than it otherwise would have. While there have been studies that show that bonus depreciation is only effective as a temporary measure,[94] an interesting observation from empirical research is that bonus depreciation can have a very powerful effect on investment in long-lived capital assets. House and Shapiro's findings indicate that the investment supply elasticities of long-lived capital assets are very high, making bonus depreciation policies very effective. Their study also

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[90] Jacob Puhl, 'Bonus Depreciation: The PATH Act and Beyond', *The Tax Adviser* (1 March 2017), https://www.thetaxadviser.com/issues/2017/mar/bonus-depreciation-path-act-beyond.html (accessed 26 November 2021).

[91] Review of Business Taxation, above n 79, vol 1, 117.

[92] The anticipated extra cost of accelerated depreciation for equipment in 2019 is over USD 50 billion in the US. However, its budget deficit has averaged around 2.9 per cent of Gross Domestic Product (GDP) in the last 50 years. Thus, the US has not been in a major and persistent deficit. Additionally, given that the size of the US economy is about USD 20 trillion, it is argued that the benefits of accelerated depreciation outweigh its costs. See Joint Committee on Taxation, 'Estimates of Federal Tax Expenditures for Fiscal Years 2017-2021' (25 May 2018), https://www.jct.gov/publications/2018/jcx-34-18/ (accessed 29 January 2022); Organisation for Economic Co-operation and Development (OECD), 'Gross Domestic Product', https://data.oecd.org/gdp/gross-domestic-product-gdp.htm (accessed 26 November 2021); Sam Fleming and Chris Giles, 'Why America is Learning to Love Budget Deficits', *Financial Times* (25 April 2019), https://www.ft.com/content/513e170a-65a9-11e9-a79d-04f350474d62 (accessed 26 November 2021).

[93] Review of Business Taxation, above n 79, vol 1, 118.

[94] Jane G Gravelle, 'Bonus Depreciation: Economic and Budgetary Issues', US Congressional Research Service Report (7 July 2014), https://fas.org/sgp/crs/misc/R43432.pdf (accessed 26 November 2021).

found no evidence of an increase in market prices as a response to bonus depreciation.[95] This suggests that bonus depreciation is a very powerful policy tool, provided that the government is willing to bear the potentially significant costs of allowing for bonus deductions.

6.6.3 General comments

Adjustments to MACRS essentially directly affect only those businesses that are capital intensive.[96] As such, this distortionary effect must be understood and factored in when formulating tax policy. Studies suggest that capital investment is more volatile than spending by consumers or governments,[97] making adjustments to MACRS potentially very effective.

6.7 Automation regulation and depreciation

Automation technology is progressing at a rapid rate and manifesting in so many different forms that it would be a considerable challenge for regulators to attempt to use a general tax provision to encompass all the relevant cases. Further, the management of the rate at which automation displaces human workers is a very delicate matter. The impact of automation in different industries varies considerably and there are good reasons for tailoring the tax treatment of the various assets according to their impact on human workers. As such, the flexibility offered by the MACRS schedular system is particularly suitable in the automation regulation context. Further, the MACRS requires that an asset must be used in a trade in order for its cost to be deducted against trade income. This ensures that it is only the displacement of human workers that is addressed; non-commercial uses of the assets, for example by consumers, would not be caught by the system. This avoids the creation of distortions beyond what is specifically targeted.

6.8 Two dimensions of adjustment (automation regulation)

Our proposed system of automation regulation would involve adjustments to the MACRS along the two dimensions considered above. As the function of automation regulation is to disincentivise specific uses of capital assets, the policy tools available to the government would be: 1) decelerated depreciation, and 2) reverse depreciation (appreciation).

6.8.1 Decelerated depreciation

This model simply involves a reversal of the declining balance method. Rather than allowing faster depreciation at the time of acquisition of the capital asset, which slows towards the end of the working life of the asset, a suitable disincentive would be provided by reversing the process and making the depreciation rate start out slowly. A stronger version of this proposal would involve lengthening the overall period over which depreciation takes place. For example, if a capital asset has a working life of 10 years, decelerated depreciation might require a firm to depreciate the asset over 20 years, even after the asset has ceased to exist, or is sold. If the asset is sold, depreciation will be calculated with an adjustment using a balancing charge.

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[95] House and Shapiro, above n 60, 762.
[96] Review of Business Taxation, above n 79, vol 1, 118.
[97] Loutzenhiser, above n 70, para 6.12.2.

The incentives considered above under accelerated depreciation would simply be reversed under our proposal and become disincentives. The taxpayer is forced to make an interest-free loan to the government, putting some strain on cash flows and potentially requiring the firm to have recourse to external capital. The certainty risk of being able to set off the prepaid taxes against future taxes would rest on the taxpayer, who may no longer be in business by the time they are allowed to do so. With all of these disincentives (which can be calibrated through the rate of depreciation), the government has a powerful economic tool which it can use to slow down the displacement of human workers by automation.

6.8.2 Reverse depreciation (appreciation)

Conceptually, there are five different positions which the government can take when it comes to the deductible value of an asset. It can allow deductions of: 1) more than 100 per cent of the present value of the expected use of the asset (bonus depreciation); 2) exactly 100 per cent of the value (neutral depreciation); 3) less than 100 per cent of the value (reduced depreciation); 4) 0 per cent of the value (no depreciation); or 5) less than 0 per cent of the value (reverse (or negative) depreciation). 'No depreciation' is an interesting case, because it treats the acquisition of a capital asset as a non-event for the purposes of income tax. The taxpayer's income is unaffected by the capital expense. Reverse depreciation is simply the inverse of bonus depreciation. Instead of being allowed to deduct more than 100 per cent of the cost of a qualifying capital asset, a firm acquiring a specified capital asset under the reverse depreciation regime will have a certain percentage of its cost treated as income. This adjustment is similar in effect to the tax recognition of a notional appreciation of the value of a capital asset. Reverse depreciation can be used as a standalone policy or together with decelerated depreciation.

6.9 Assessing the two dimensions (automation regulation)

The costs to the government under accelerated depreciation (discussed above) become potential sources of revenue under decelerated depreciation. In the case of reverse depreciation, by disallowing certain portions of the cost of capital assets, the government essentially deems the profit of a firm to be higher than its true profit. The additional tax revenue collected from this exercise can then similarly be hypothecated and used to correct the social externalities created by automation.

6.10 Distinguishing employment-complementing from employment-substituting capital

Having established that the two goals of our proposed tax reform are best accomplished by making adjustments to the system of capital allowances, we will now suggest two approaches for distinguishing between employment-complementing capital, expenditure on which will enjoy higher rates of tax deductibility, and employment-substituting capital, expenditure on which will be relatively less tax deductible.

Both approaches are similar in that they assess the causal effect of capital on employment in order to determine the rate at which expenditure on this capital should be tax deductible. The difference between both approaches lies in how the causal effect of the capital investment on employment is determined. The first approach assesses the collective effect of the firm's capital investments as a whole, while the second approach targets individual instances of capital investment. Another difference is that the first approach takes a backward-looking and empirical approach to measuring the effect of

the firm's capital investment decisions on employment, while the latter approach forecasts the likely effects of individual instances of capital investment based on the features of the asset purchased.

The first proposed tax reform ties the overall deductibility of capital investment to the company's overall record of employing workers. Under this proposal, the percentage of the annual depreciation cost of the capital investment that is deductible as part of the company's capital allowance will vary each year depending on the total net percentage change in employment in that year. Companies that reduce employment levels in a given year will only be allowed to deduct part of the full annual depreciation cost of their investment from their taxable income in that year, while companies that increase overall employment levels will instead be granted a bonus deduction of more than 100 per cent of the annual depreciation cost of that investment. This reform has several features and implications.

It considers the company's use of capital and assets holistically. Instead of assessing each piece of capital in isolation to determine its effect on employment, it treats all the capital of the company as an entire system along with the company's processes and operations. This accounts for the possibility that the effect of a piece of capital on employment is determined not only by its nature and type but also by the way it is deployed within the company as well as its interactions with other capital investments.

By adopting a backward-looking and empirical approach of observing employment data, this approach offers greater accuracy in determining the magnitude of the change in employment that follows from a company's investment policies, at the cost of reducing certainty about the cause of this change in employment. The advantage of this approach is that it creates a strong incentive for companies to raise or maintain employment by directly targeting the intended outcome – ensuring that employment levels are maintained in the face of increasing automation. The disadvantage is that it is difficult to determine whether observed changes in employment levels should be attributed to the capital investments made by the company, blunting the incentive for the company to invest in employment-complementing capital.

It provides the greatest incentives to raise employment for capital-intensive companies. As these companies have higher levels of capital expenditure, they stand to gain more from capital allowances should they invest in employment-complementing capital. This contributes to improving the overall productivity of the economy by providing greater incentives for job creation in high-productivity companies.

It provides companies with distinct direct and indirect incentives to maintain or increase net levels of employment. The direct incentive arises because companies that reduce their net employment levels suffer an immediate reduction in the tax deductibility of their capital expenditure. The indirect incentive arises because companies that face a choice between an employment-complementing capital asset and an employment-substituting capital asset will, all things equal, expect a future tax benefit from choosing the former over the latter.

Companies that have made capital investments in the past will face the same incentives to maintain or raise overall employment levels as companies that are planning to make capital investments, because the deductibility of both past and future capital expenditure depends solely on changes in present employment levels.

By tying the deductibility of capital expenditure to net employment instead of gross jobs displaced, this proposal creates an incentive to hire workers that is symmetrical to the disincentive to retrench workers. The upshot is that labour market rigidities are minimised because firms are not penalised for retrenching workers if they do not have significant profits against which capital expenditure can be deducted or if they balance these retrenchments with the hiring of new workers.

The second possible approach is to remove or reduce the deductibility of capital expenditure on a specified group of items, regardless of whether capital expenditure on these assets coincides with any changes in overall firm employment levels. These specified group of items are those capital assets that are deemed as significant contributors to the problem of automation-induced job displacement, based on the conjunction of several criteria: 1) their propensity to be deployed in ways that displace existing jobs; 2) their potential for widespread adoption and by extension for widespread job displacement, and 3) their low likelihood of contributing to the creation of new job opportunities.

This approach relies on the classification of capital assets into categories based on their propensity to substitute or complement employment, as well as the subsequent promulgation of this classification as schedules detailing the deductibility rates of capital expenditure on different assets. The use of schedules here as an administrative mechanism is well established. Indeed, schedules that specify the depreciation are used in the administration of the existing capital allowance system. Modifying and expanding these schedules to also specify different rates of deductibility for different capital assets is a natural extension of the existing capital allowance system. A panel of independent experts can be convened to draft the schedules and perform the categorisation of assets.

This approach avoids labour market rigidities because the deductibility of capital expenditure is tied to the nature of the asset, instead of the firm's decisions on employment. Hence, the firm is not subject to any new restrictions or policies on hiring or firing workers, preserving labour market flexibility.

6.11 Leakage

Our proposal of reducing the deductibility of capital expenditure for some classes of capital assets faces the major challenge of avoiding leakage through outsourcing and offshoring. Companies can respond to our proposal by offshoring or outsourcing production that intensively uses employment-substituting capital to foreign contractors or suppliers that are not affected by our proposed changes to the tax regime.[98]

The EU faced a similar issue, termed 'carbon leakage', in its implementation and enforcement of the EU ETS, a cap-and-trade policy on greenhouse gas emissions.[99] While the ETS was introduced to encourage companies to reduce emissions, there was concern that companies would respond by outsourcing emissions-intensive production to countries with less stringent environmental laws in order to ensure that their own

[98] Muûls et al, above n 45, 5-8.

[99] Fiona Harvey, 'Britain Merely "Outsourcing" Carbon Emissions to China, Say MPs', *The Guardian* (18 April 2012), https://www.theguardian.com/environment/2012/apr/18/britain-outsourcing-carbon-emissions-china (accessed 26 November 2021); Borkent et al, above n 41.

emissions remained within their allowances.[100] The extent to which carbon leakage has actually blunted the impact of EU emissions policy is unclear.[101]

The upshot is that the possibility of 'automation leakage' should be seriously considered by policy-makers when designing and implementing changes to the existing system of capital allowances. Notwithstanding this, the extent of any automation leakage is likely to be less than that of carbon leakage. The suppliers and contractors in the case of carbon leakage are likely to be based in less developed economies with a weaker incentive to implement stringent environmental regulations. In the case of automation leakage, however, the infrastructure, technological ecosystems, and highly specialised labour required for automation-intensive production are likely to be found in highly developed economies – the very economies with the strongest incentive to discourage excessive automation for fear of displacing domestic employment. This reduces the potential severity of the issue and creates the possibility of cooperation between developed economies to jointly tackle the related problems of automation-induced job displacement and automation leakage.

In the event that the issue of automation leakage materialises, it is likely to be concentrated in a limited number of sectors. The reason for this is that the relocation of production to avoid the incentives against using employment-substituting capital is only viable under the following limited conditions: first, the returns from employment-substituting capital in that sector must be significantly greater than the returns from employment-complementing alternatives; second, the sector, or at least crucial links in the supply chain, must be tradable; finally, it must be economically viable in that sector to relocate supply chains to an economy without similar policies to discourage employment-substituting capital.

6.12 Conclusion

In light of the research by House and Shapiro indicating that the investment supply elasticities of long-lived capital assets are very high,[102] the adjustments we have proposed would seem to have considerable potential to affect taxpayer behaviour. When we consider that most forms of automation are highly capital-intensive and that adjustments to the MACRS generally only affect businesses which are capital-intensive,[103] the proposed adjustments seem reasonably fit for purpose. These effects, when combined with the revenue generation function of the adjustments, make them a very viable proposal for the 'automation tax'. In fact, the schedular nature of the MACRS and capital allowances system provide the government with much needed flexibility to successfully regulate the rapidly developing field of automation. We therefore conclude that the MACRS is likely to be a most appropriate candidate for the proposed 'automation tax'.

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[100] Harvey, above n 99; Muûls et al, above n 45, 5-8.
[101] Sander de Bruyn, Dagmar Nelissen and Marnix Koopman, 'Carbon Leakage and the Future of the EU ETS Market: Impact of Recent Developments in the EU ETS on the List of Sectors Deemed to be Exposed to Carbon Leakage', CE Delft Final Report (April 2013); Muûls et al, above n 45, 5-8.
[102] House and Shapiro, above n 60, 762; Loutzenhiser, above n 70, para 6.12.2.
[103] Review of Business Taxation, above n 79, vol 1, 118.

7. CONCLUSION

This article has argued that by using reverse depreciation/capital allowances, governments and tax authorities are able to make use of an existing and well established system that is especially well suited to deal with the problems of lack of precision and slowness of response to change. An automation tax could practically be implemented using reverse depreciation/capital allowances as a mechanism. As a useful tool for governments to have on hand, an automation tax can be quickly implemented by building on the existing depreciation/capital allowances framework where necessary. It can be used to manage the balance between the positive and negative externalities of automation and artificial intelligence by calibrating the level of their adoption through the use of these tax incentives. As the benefits from the efficiency savings from automation and artificial intelligence continue to be attractive to the majority of states, we do not anticipate that the robot tax will be adopted widely. However, it remains a useful policy tool in those select situations where social considerations may need to be prioritised.