



## **Centre for Tax Policy and Administration**

### **Tax guidance series**

#### **General Administrative Principles - GAP004 Compliance Measurement**

## **Compliance Measurement – Practice Note**

**Prepared by the OECD Committee of Fiscal Affairs Forum on Strategic Management**

### **Caveat**

Each Revenue authority faces a varied environment within which they administer their taxation system. Jurisdictions differ in respect of their policy and legislative environment and their administrative practices and culture. As such, a standard approach to tax administration may be neither practical nor desirable in a particular instance.

The documents forming the OECD Tax guidance series need to be interpreted with this in mind. Care should always be taken when considering a Country's practices to fully appreciate the complex factors that have shaped a particular approach.

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## Compliance Measurement – Practice Note

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## Compliance Measurement – Practice Note

### Introduction

1. This paper is another in the Tax Guidance series of strategic management papers focussing on *General Administrative Principles*. It has been developed in consultation with a number of OECD members.
2. The purpose of this paper is to raise issues in defining compliance and to provide a synopsis of the work done to date on measuring taxpayer compliance. It seeks to encourage discussion and further research into the topic of measuring tax compliance (or non-compliance) - **especially compliance in the large corporate taxpayer sector**. While there is a significant body of published work on compliance measurement (mainly from the United States), such works are in great part limited to individuals and occasionally small business. As Eric Rice (1992: 126) has noted in his paper on the Corporate Tax Gap, "... *despite its real world importance, corporate income tax evasion has attracted essentially no scholarly analysis.*"

### The Issues

3. Most tax authorities around the world undertake a mix of processing, service, enforcement, litigation and sometimes legislative activities, many of which are aimed at improving taxpayer compliance. In carrying out these activities, it is important for a tax authority to be able to determine whether these activities are achieving the required outcomes, including determining whether there are having any impact on compliance. How do tax authorities demonstrate whether taxpayers within their jurisdiction are more compliant today than they were say 5 to 10 years ago?!
4. Any examination of compliance measurement raises a number of issues, including -
  - definitions of compliance;
  - methods by which tax authorities measure levels of compliance and hence identify areas of apparent low compliance; and
  - methods by which tax authorities (and others?) measure the effect of an administration's strategies (whether of an enforcement, legislative, litigious or service nature) which seek to improve compliance.

### What is Compliance?

5. In attempting to measure compliance, it is important to know what is to be measured - evasion, avoidance, compliance or non-compliance. How is compliance defined - is it compliance according to the tax authority's or the taxpayer's interpretation of the law and its application to the facts? Is it from another more neutral perspective? Researchers have lamented over the lack of agreement to exactly what is being measured, noting that this has been a key obstacle to progress (see Henry, 1983).
6. In considering definitions of compliance, it is convenient to divide compliance into two key categories -
  - Administrative compliance (complying with the administrative rules of lodging and paying on time, what some would include within their definitions of compliance with reporting requirements<sup>1</sup>, procedural compliance<sup>2</sup> or regulatory compliance<sup>3</sup>); and
  - Technical compliance (i.e., taxes calculated in accordance with the technical requirements of the tax laws or taxpayers pay their share of tax in accordance with the provisions of the tax laws.)
7. Obviously, measuring technical compliance must begin with determining the correct amount of tax payable. Given the not uncommon *ambiguity* in the interpretation and application of the tax laws, determining what is the correct amount of tax can differ widely, depending in part on the background, biases and skill levels of the person(s) endeavouring to do so.

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<sup>1</sup> Roth, Scholz, Witte (eds.) (1989: 21).

<sup>2</sup> Kidder & McEwen (1989: 57).

<sup>3</sup> Smith (1988: 21).

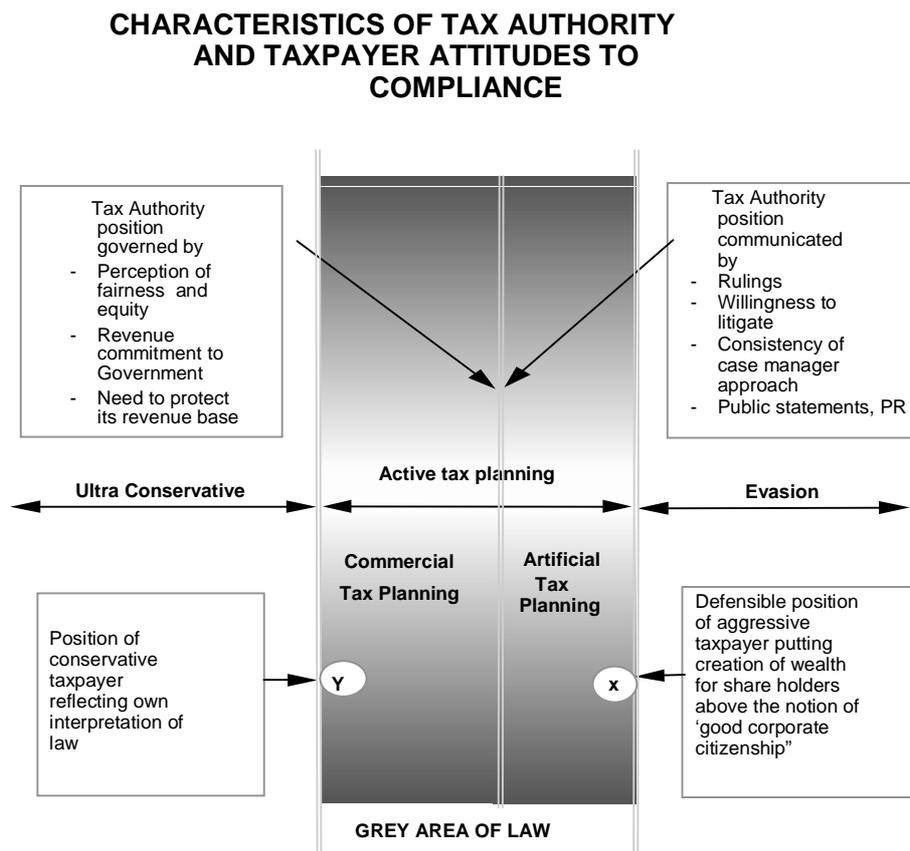
*a) Ambiguity*

8. Generally, income tax laws are not clear cut, especially those applying to large corporates. There are significant areas within these laws which are uncertain or ambiguous (or grey), where taxpayers and tax administrations (and others) might have reasonable but differing interpretations of what the tax laws require. According to Long and Swingen (1991: 646), ambiguity exists at three levels –

- in the precise meaning of statutory language,
- in the application of how the law applies in a specific factual situation, and
- in the type of evidence sufficient to establish the facts.

9. Tax authorities and taxpayers often take different positions in defining compliance where the law is uncertain or grey. Figure 1 below seeks to show the difference in positions which might be adopted by a tax authority, by an aggressive tax-minimising taxpayer and by a tax-conservative taxpayer. A taxpayer who aggressively seeks to exploit the law may take a position at point X, say, in the range of possible interpretations of compliance with an uncertain law, whereas point Y represents the position which a quite conservative taxpayer might take. The tax authority's position will often lie somewhere between these two extremes.

**Figure 1: Characteristics of tax authority and taxpayer attitudes to compliance**



10. Though surveys of tax practitioners indicate ambiguity is a significant problem for taxpayers at all income levels, Long and Swingen assert any ambiguities which lead a taxpayer to a different interpretation from that of the tax administration's (assumedly inclusive of a tax administration's interpretation developed and promulgated well after lodgement of the tax return) traditionally are considered by administrations as representing non compliance (*op cit*: 647). It is emphasised that what is being defined is compliance with the tax laws, not whether the tax laws are effective.

11. Interestingly, the authoritative and often referred to work commissioned by the US's IRS and edited by Roth, Scholz and Witte (1989)<sup>4</sup>, generally treats taxpayers who take an *ambiguous* position as being compliant. They prefer to use the term *tax reduction* to mean compliant behaviour that reduces tax in a way perhaps unintended by legislators, but is permissible under statute. Therefore in figure 1, Roth et al would assert that taxpayers at all points between X and Y, inclusive, are compliant.

12. Compliance with the tax laws as interpreted or confirmed by the judiciary may be a truer definition of compliance. Arguably, this removes the uncertainty or greyness; with both the taxpayer and tax authority's interpretation merging at that point. However, particularly with the more complex areas of the law often applicable to large corporates, Court interpretations often turn on the facts of that case. In addition, the time lags associated with litigation often mean the judiciary's position is not known at that earlier point in time. So in practical terms, in the absence of a pertinent judicial decision, the dilemma remains, compliance according to whose perception - the taxpayer's, the tax authority's or someone else's?

13. Kinsey's assertion that most research tends to treat non-compliance as if it were a *behaviour* when it is actually a *social judgement*<sup>5</sup> may indeed be correct.

#### **b) Motivation**<sup>6</sup>

14. Should "intention" be an important factor in determining non-compliance?

15. Until recently, most research<sup>7</sup> assumed all non-compliance was intentional, but is that so? Logically, it would seem the more complex the tax laws, the more the chance of a taxpayer reporting incorrectly. Given that large corporates operate in an environment of highly complex laws – tax and others, it is reasonable to assert that taxpayers in this large segment would be more susceptible to unintentional, incorrect reporting. Interestingly, Long and Schwartz (1987) have shown that this does not necessarily mean under-reporting. They found higher income earners and business taxpayers to be more likely to assess themselves to tax at too high a level *as well as* at too low a level.

16. From a tax administrator's viewpoint, to be able to measure compliance in a practically feasible way, it seems preferable to adopt an approach which removes any reference to motivation. Such an approach is supported by Smith (1988: 22), " .... it is important we do not build intentionality into the definition of non-compliance", and Roth, Scholz, Witte (1989: 22) who "..... excluded ..... judgements about the intentions and psychic state of the taxpayer from the definition of compliance."

17. Seemingly, more discussion needs to be undertaken on definitional issues, including ambiguity and motivation, and on varying country approaches to these issues. For the purposes of this paper, the issues around ambiguity are recognised and the issue of motivation has been removed - so that the paper may move on and examine some of the possible ways available to measure compliance levels.

### **Why Do We Need To Measure Compliance?**

18. It is reasonable to assume tax authorities seek to use their resources in an optimal way. It is also reasonable to assume administrations seek to collect the tax correctly payable in accordance with the tax laws. Therefore as part of the process in allocating scarce resources to achieve maximum effectiveness, it is appropriate to identify areas (issues and/or taxpayers) of low or non-compliance, and then be able to rank them.

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<sup>4</sup> A panel consisting of eminent researchers was commissioned by the IRS. They published a 2 volume work on taxpayer compliance in 1989, see "References" section.

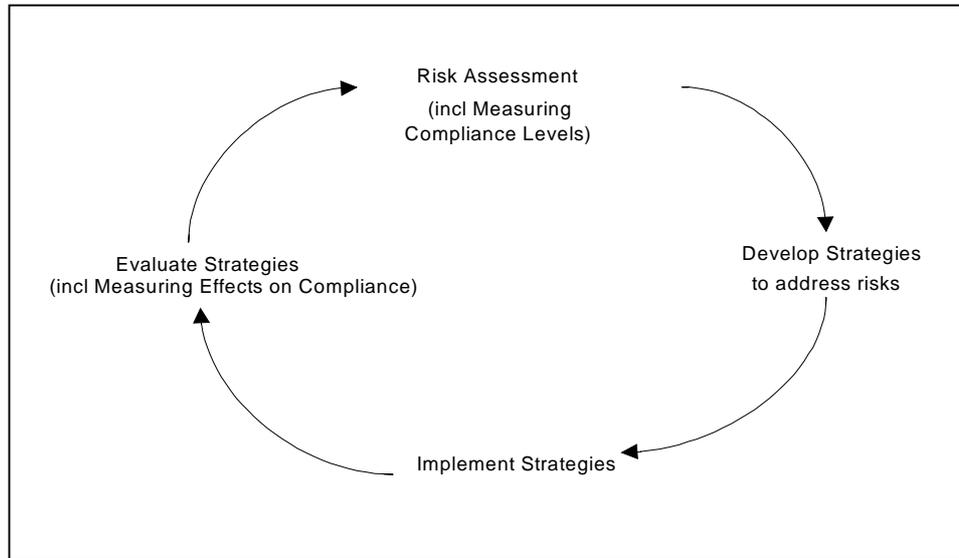
<sup>5</sup> See Long and Swingen (1991: 657)

<sup>6</sup> Also referred to as 'intentionality' by Smith (1988: 22)

<sup>7</sup> For example - Allingham and Sandmo (1972), Cowell (1985)

19. Once risks are identified and ranked, the next step is to develop and implement strategies to address at least the highest priority risk areas. Strategies might be of a legislative, educative, administrative, litigious or enforcement nature, or any combination of these.

**Figure 2: "Simplified" Risk Management Cycle**



20. Integral to an evaluation of the effectiveness of the implemented strategy(ies) is the measurement of the compliance levels of the target group – and perhaps others, and this is usually undertaken on completion of the initiative. This post strategy measurement of compliance levels can assist in identifying best practices as well as contributing to the ongoing assessment and management of risk across the population group.

21. The prime reasons for measuring compliance, therefore, are first to *identify* areas and levels of non-compliance and secondly to *evaluate* the effectiveness of strategies used to address the identified areas of non-compliance.

### Different Measurement Methods

22. There are a range of measurement methods which can be used to quantify compliance. All methods, including those discussed in this paper, have specific benefits and limitations. Not all of these measurement methods need stand-alone - it is possible, even advisable, to explore the possibilities of blending different methodologies.

#### a) *Audit Based Studies*

##### i) *random audit sample data*

23. The most widely dissected and perhaps most significant taxpayer compliance measurement program undertaken to date has been the US IRS's Taxpayer Compliance Measurement Program (TCMP). This program used data which resulted from a statistically valid sample of randomly selected returns which were subjected to audit. In terms of descriptive and predictive power, such data are generally agreed to provide a better measure of compliance with the tax laws.

24. Two key factors are needed to ensure the success of such audit based methods - the random selection of returns with a carefully designed stratified sample and audits which are uniformly as thorough as possible. By randomly selecting returns, operational return selection biases are avoided. By attempting to ensure uniformly thorough audits, return on investment constraints typically present in an operational environment are avoided. The ultimate goal of audit based compliance measurement should be to determine, to the extent possible, the difference between each taxpayer's return as lodged and how it should have been lodged.

25. The taxpayer types included in the IRS's TCMP have usually been individuals, though returns from small corporations, estates, partnerships, tax exempt organisations, and employee pension plans have been included in some surveys. The sample size in the first year was 100,000 taxpayers, in later years 50,000 and in proposals for even later years 26,000.

26. There are a number of potential detractions from audit based compliance measurement programs.

27. First, the cost of audit based compliance measurement is typically the opportunity cost - the cost of productive auditor work foregone to perform the audits on a randomly selected cases without an unknown productivity expectation. These costs and other more direct costs are not trivial and would appear to be the reason for this type of program not being adopted more widely.

28. The second potential detraction is the potential burden on the taxpayer population in auditing taxpayers at random. Assumedly, this burden could be observed by way of random audit selection processes resulting in more "no change" outcomes than other audit cases selection processes would. If, however, the data from compliance measurement were used to develop more effective case selection techniques which resulted in a lower overall "no change" rate, the increase in short term burden might be offset by a decrease in long term burden.

29. Intrusiveness is an issue if audits in an audit based compliance measurement program are significantly more rigorous than more common operational audits. With the US's TCMP, the increased intrusiveness takes the form of broader, not deeper audits. In TCMP, auditors are required to consider each line item on the tax return and determine whether there is sufficient cause to investigate it. A justification for the increased intrusiveness or scope of compliance measurement audits might be that new or emerging tax compliance issues need to be addressed in the process. Often these issues may not appear cost effective to work in an operational environment, however, compliance measurement audits might better detect such problems, whether the eventual solution might involve refocusing enforcement activities or some other administrative or legislative remedy. Another justification might be that issues too small to be reliably detected through normal operational audit activities might be detected as being so pervasive as to be fiscally significant.

*ii) operational audit data*

30. It is possible to reduce the burden, intrusiveness and opportunity costs of audit based compliance measurement by using data from normal operational audit activity.

31. However, the compliance measures resulting from operational data have the potential to be inaccurate and not representative of the taxpayer population. It is important to note that the goal of compliance measurement is to describe the level of compliance of the taxpayer population, not just that part selected for normal audit scrutiny. In using this methodology, the tax authority's tactical goal of attempting to ensure only sufficiently non compliant taxpayers<sup>8</sup> are selected for audit can be diametrically opposed to its strategic goal of determining taxpayer compliance patterns.

32. Further, care must be exercised if anything other than a random<sup>9</sup> sample is to be used as some researchers have found taxpayers who are selected for *regular* audits do not tend to be representative of non-compliant taxpayers (Long & Swingen, 1991: 658, however note they cite researchers with different views).

33. Also with operational audit compliance measures, there are no verification processes to ensure assumed compliant taxpayers are, in fact, compliant. By using indicators of non-compliance to select audit cases, large portions of the compliance landscape can go unexplored. In addition, new and emerging or difficult to audit issues may not surface as these may be thought to be unproductive areas for audit.

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<sup>8</sup> For example, salary and wage employees are often felt to represent low risk of non-compliance because income tax is withheld at source. These types of taxpayers frequently represent a large percentage of the total number of taxpayers. If these taxpayers are not subject to audit in relative proportion to their numbers, compared with other types of taxpayers representing higher compliance risks, the measurement of taxpayer compliance may become skewed.

<sup>9</sup> Interestingly but perhaps not surprisingly, Peereboom (1995: 15) has noted a practical problem with the random allocation of taxpayers to different treatments in that tax auditors prefer to audit taxpayers at high risk instead of taxpayers *believed* to be compliant.



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iii) other issues in audit based methods

34. Another detraction with audit based methods is the inability of an auditor to fully detect the extent of non-compliance in every case. Reasonably arguable differences as well as inadvertent non-compliance are probably more likely to be detected in an audit, than would be deliberate and perhaps exploitative attempts to conceal an issue from an auditor.

35. Account also needs to be taken of the biases that an auditor from a tax administration brings to an audit. Feinstein (1991), has used IRS audit data and econometric techniques to estimate the extent and some of the causes of variations occasioned by auditor bias (including auditor experience). One of his conclusions was that "... variations in detection rates are at least as important a source of variation in detected evasion across cases as variations in .... (taxpayer) characteristics. To explore the variation in detection, individual effects .... (were specified).... for .... (auditors). .... Collectively, these effects are highly significant, and they indicate considerable heterogeneity among (auditors)" (op cit: 15). Elffers, Robben and Hessing (1989, 1991) and Elffers (1991) work within the Netherlands has suggested that variations dependent on the auditor can be significant.

**b) Changes in Tax Return Items**

36. Another, perhaps more straightforward method for measuring compliance is to compare changes in items on taxpayer return forms from period to period<sup>10</sup> to deduce changes in compliance levels.

37. The applicability of this 'simple' methodology is *questionable* in a real world environment where there are numerous factors that impact on a taxpayer's performance over time. At the large end of the market, these factors are often from global influences on income and expenditure, influences often beyond the researcher's ability to *readily* identify and measure. Examples of these factors may include corporate restructuring (e.g. mergers and acquisitions), costs associated with establishing new markets, and new legislative and administrative policies at home and offshore both of a tax and non-tax kind.

38. Long and Swingen (1991: 662) undertook a comparison of data from return based measures and data about changes in compliance from TCMP. They found changes within the two sets of data moved entirely independently of each other. They recommended that such measures should not be relied upon until their reliability and validity can be established via further research.

39. While the quantity of return form data is significant and permits better trend information than trends using audit results, support for this methodology may be limited because of the inability to take into account many impacts of the real world environment. It would seem that further research using this methodology should be limited to relatively *homogenous, non-complex* taxpayer populations, and ideally where *suitable control groups* can be found.

**c) Financial Data - Comparisons, Ratios, etc**

40. This includes methods which seek to predict the likelihood of a taxpayer or a group of taxpayers being non compliant by using comparisons over time or across a population (e.g. across an industry) of a number of key financial performance trends and indicators. Some of these trends and indicators can include the following, which are explained in more detail in appendix A:-

- Horizontal Analysis
- Vertical Analysis
- Profitability Ratios (including gross profit margin, net profit margin, Berry)
- Capital Structure Ratios (including gearing, net debt cover, net interest cover)

41. Generally, differences between accounting or book profits and taxable income will usually occur because of the basic differences in accounting and tax concepts and because there are usually some legal preferences available to taxpayers under applicable tax laws. It has been contended that levels of technical compliance may be effectively measured by

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<sup>10</sup> In jurisdictions where several different taxes (e.g. income tax, consumption tax, payroll tax) are administered by one organisation, it is also possible to conduct comparisons between return form data for different types of tax in a single period.

examining the gap between accounting profits and taxable income. Some relevant indicators in this regard might be effective tax rates, taxable income to accounting profits, and taxable income to total income.

42. The most appropriate set of ratios will vary, depending on the type of taxpayer population being examined (e.g. the type of industry) and the area-of-risk being focussed upon. For example, performance/profitability type ratios are arguably more appropriate when focussing on offshore profit shifting.

43. A typical approach to establishing performance benchmarks for a taxpayer population is to calculate the mean, or some other appropriate statistic such as the trimmed mean, median or mode, for each of the corresponding attributes of the data set. The statistics to be preferred will depend on a number of factors, which include the reliability of the underlying data, the variability of the corresponding attributes across the members of the population, the degree to which the members of the data set represent a homogeneous population, and the theories underlying the uses of the attributes as performance benchmarks.<sup>11</sup>

44. These statistics can then be used as benchmarks for comparing the performance and compliance behaviour of individual members of groups of the taxpayer population.

45. A good reason for undertaking analysis of compliance by using data external to the tax administration is that data are not limited to tax return data, and therefore measurement may not be subjected to the time lags associated with the lodgement and processing of tax returns. At the larger end of the market, typical sources for the basket of information that may be used in ratio and other compliance analyses include the taxpayer's published accounts, external commercial databases, newspaper and other media reports, other law enforcement agencies' reports and databases, and of course the tax returns themselves.

46. It is axiomatic in compliance research that multiple measures of data points allow better estimates both of data precision and data reliability. Therefore, comparisons of internal and external data should prove useful.

47. As with other methods, there are problems in the application of this methodology with identifying, isolating and quantifying the effects of a range of global and domestic factors which may influence the taxpayer's performance.

48. Further, data is often only available in aggregate form. The only feasible way to use such data is to conduct categorical matching rather than case by case matching. Further, with aggregated financial data, tensions may exist where information provides two or more opposing interpretations, e.g. one ratio set indicates a remarkable improvement over time and another shows a small, or even no improvement. It may, therefore, be preferable to limit the outcomes from this methodology to a more qualitative assessment of compliance levels (rather than quantitative). Some experiences from preliminary use of this methodology have indicated that it is best used in a mix of qualitative and quantitative ways to measure a single taxpayer's (which may be a corporate group) performance longitudinally over time.

49. With a well segmented market approach to tax administration, the effects of some of the limitations may be minimised by the practical knowledge held by frontline operatives and their understanding of their segment participants.

#### *d) Other Methods*

##### *i) Surveys*

50. Roth, Scholz and Witte (1989: 210) and Long and Swingen (1991: 660) refer to the works of other researchers<sup>12</sup> with surveys of, or self reports by, taxpayers. These studies used responses from samples of taxpayers (ranging from 500 to 2,000) on failures to report non compliance. Roth et al (*op cit*: 211) list the strengths of surveys as their ability to capture a

<sup>11</sup> A major project in Australia, currently in its development stages, seeks to develop a series of models using standardised data (from within, and external to, the ATO) which can be applied to measure taxpayer profitability and tax performance **compared** to economic activity. An outcome should be the development of a number of indices including a profitability index, a taxation index and an effective tax index that could be used to measure trends in compliance. The project is a collaborative effort between a prestigious business school and the tax administration in Australia.

<sup>12</sup> e.g. Mason, Calvin and Faulkenberry (1975); Aitken and Bonneville (1980), Yankelovich et al (1984); Hessing, Elffers and Weigel (1988).

broad range of explanatory variables known only to taxpayers, notably their understandings of compliance requirements, relevant values and attitudes, expectations of risks and benefits of non compliance, and other events etc which affect a taxpayer's willingness to comply or not.

51. Disadvantages noted by Roth et al (1989: 212) and Long and Swingen (1991: 660) include the accuracy and hence confidence in the data through variations in definitions of issues such as non compliance, the integrity of the answers<sup>13</sup> for deliberate or inadvertent reasons (e.g. memory lapses, or taxpayers may have little involvement in return preparation leaving it to their tax agents) and the inability to report on inadvertent omissions. Interestingly, Hessing et al (1988) found *no correlation* between self disclosed non-compliance and auditor findings.

*ii) Direct Observation*

52. Long and Swingen (1991: 657) note that this technique is used extensively in tax evasion experiments (e.g. see Webley et al 1991; Alm 1991). Here the researcher knows and perhaps controls the subject's correct tax liability, comparing that with what the subject reports. The effectiveness of this is affected by the 'realism' of the experiment to the subject. However, it is suggested that the methodology can be used more widely. Whether it is appropriate for large corporate compliance measurement is arguable, given the number of decision makers etc (e.g. tax manager, tax agent, legal department, board of directors, CEO) which have an impact on the corporate's tax behaviour.

*(iii) Analytical Modelling*

53. The value of compliance measurement data can be potentially enhanced or extended by descriptive and/or predictive modelling. Various statistical and mathematical methodologies may be used for extrapolating raw compliance measures, each of which holds the potential to provide varying degrees of descriptive and predictive power. However, all of these methods presume there is some representative, stable basis from which to extrapolate. Practically, this usually presumes the availability of audit based compliance measurement data.

54. The benefit of analytical modelling is that less data should be needed to describe compliance issues. The potential cost of such modelling is around error estimates for models based on small data sets, which can be expected to be greater than the error estimates on direct analysis of larger, raw data sets.

55. In the US, the IRS has developed the Compliance Research Information System (CRIS), which uses a regression based modelling technique to extend TCMP data into compliance estimates for individual market segments. Although this has enhanced the utility of the TCMP data for compliance measurement purposes, it is emphasised that the availability of such audit type data was a precursor to the development of CRIS.

56. In scaling up data, care needs to be taken in the choice of an appropriate estimator. Not surprisingly, widely differing population estimates of non-compliance can be obtained depending on which estimator is used. Whatever type of estimator is used, specific attention needs to be given to ensuring careful consideration of the wide range of accompanying statistical caveats; the underlying (perhaps only implicit) theory utilised about the determinants of non-compliance; and the main uses to which the various estimates are to be put. (Wickerson 1993: 22)

*iv) Laboratory/Field Experiments*

57. Wallschutzky (1993:9) refers to a Dutch study by Webley, Robben and Morris<sup>14</sup> and suggests a number of possibilities for using experiments. For example, field experiments would allow researchers to determine which variables are more likely to affect reporting behaviour. Participants could report under a scenario of help/assistance, others could be told

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<sup>13</sup> Spicer and Lundstedt assert their mail survey (conducted in 1974) used a survey design and a pre test which assured them of a fairly high degree of face validity. Further, on the issue of respondent honesty, Spicer and Lundstedt felt that responses which guaranteed complete confidentiality and which related *directly to an individual's own propensity to evade* could produce reliable results.

<sup>14</sup> Reportedly, one of the first field experiments to use the general public in a computer simulation concerning income reporting for a shop which was managed by the participants over a three year period. Different information was given to participants and participants were advised they could expect an audit.

about penalties and yet others about the possibilities of an audit. The most influential variables could then be determined. Problems with laboratory experiments, he observes, include ethical issues, the representativeness of participants (often students are used), the small scale and ability to generalise, as the disposition of participants to treat the experiment as a game and not a real life situation.

58. Roth et al (1989: 229) recommended to the IRS that the use of field and laboratory experiments be expanded to analyse the compliance effects of innovations in tax administration. They do recognise the limits imposed by the administrative burdens and opportunity costs and the law itself. An area considered to be 'fruitful' for experimentation include the functions of tax administration. (*op cit*: 230)

#### *e) Which Method Should Be Used?*

59. There is no correct answer. Though tax compliance research may have come a long way since the theoretical economic analysis of Allingham and Sandmo in 1972, today there are still no simple or off-the-rack models for precisely measuring the level of taxpayer compliance. Not surprisingly, given the varying definitions and perspectives, the outcomes from one method are not reinforced by other measures of compliance. Long and Swingen (1991: 664) observe that it seems likely that different methods prove advantageous for measuring different types of behaviour or when obtaining perspectives from different parties in the process by which compliance becomes defined. However no one method can address all needs and perspectives.

60. Perhaps, as Long & Swingen (*op cit*: 664) suggest, the answer lies in focusing on specific types of non compliance, not presuming to measure all things for all people in a single item or on a one dimensional scale. As there is not one universally applicable solution, methods may need to be tailored to different groupings. Also, it may be that no one single indicator is applicable, with progress being assessed in relation to a number of different indicators, derived from a number of different methodologies, which taken together provide a measure of the compliance level.<sup>15</sup>

## Evaluation Issues for Compliance Improvement Strategies <sup>16</sup>

### *a) Generic Problems In Measuring Changes In Taxpayer Compliance*

61. Logically, the problems associated with measuring taxpayer compliance at both the individual taxpayer and group or population level need to be taken into account when assessing the extent to which taxpayer compliance may have changed over a period of time. As a general rule, it cannot be assumed that the magnitude and incidence of these measurement problems will be constant over time and hence can be safely ignored. These problems, therefore, are of central importance when evaluating the compliance impact of tax administration programs.

62. This is particularly so where the tax base and hence the true level of reportable taxable income has changed over the evaluation period. This can result from changes in the tax laws, economic conditions or in the tax-related structure of the taxpayer. In addition, the extent and nature of the taxpayers' underlying propensity to comply may have changed over the period. If so, whether or not this is due to the program treatment is in itself a moot point, especially where this was the desired outcome.<sup>17</sup>

63. The measurement of *changes* in tax compliance is confronted by a number of potentially complex 'index number' type problems. In many areas of the social sciences, 'index numbers' are constructed so as to remove or at least reduce the degree of ambiguity that would otherwise adversely affect the monitoring of changes in key economic and social indicators.

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<sup>15</sup> An analogy is with the tools of economic management. No one indicator provides a definitive measure of a country's performance, rather an overall assessment is made on the basis of a range of different indicators.

<sup>16</sup> The majority of this part of the paper is from a paper presented at an ATO Research Conference by J Wickerson - see "References".

<sup>17</sup> Importantly, not all components of a compliance improvement program will necessarily improve taxpayers' underlying propensities to comply. For example, deterrence based programs arguably do not have this effect, whereas, by contrast, initiatives which successfully enhance taxpayers' sense of public duty arguably do have such an effect.

64. Once compliance is defined (see paragraphs 5 to 17 above), the further challenge is then to take into account all other types of economic, social and legal changes which would otherwise prevent an unambiguous interpretation of the data available for a change in taxpayer compliance *per se*. These challenges arise at both the individual taxpayer and corresponding population levels of analysis. To date, little or no research has focussed on the nature and extent of these and similar 'index number' problems. Yet these problems can be critical, especially where the measure of compliance is the percentage of taxable income which is correctly reported. Of course, this is the natural measure of compliance to take when taxable income has itself changed over time. However, as Long (1991: 189) has pointed out, quite feasible variations in profit margins can fully account for observed changes in the 'compliance rate' for businesses. Taking such variations into account, Long suggests, can bring into question the widely held view that the rate of compliance by small businesses has been declining in the United States.<sup>18</sup>

65. It is reasonable to argue that such 'index number' problems are more likely to be tractable where the focus is on reasonably homogeneous groups of taxpayers who are affected in much the same way by changes in the tax laws, economic conditions, etc.

66. In turn, the problems in measuring or estimating the impact on taxpayer compliance of narrowly-focussed compliance initiatives are likely to be less than in the case of broadly-based ones.<sup>19</sup> However, the general point is that even if it is possible to utilise (say) suitable 'control' and 'experimental' populations of taxpayers to demonstrate that a program initiative had some beneficial overall revenue impact, it may not be possible to demonstrate convincingly that compliance by the latter population has unambiguously improved compared to that prior to the program 'treatment'.

67. This point applies to each of the following four main components which can constitute an observed program-induced change in compliance by a targeted population of taxpayers.

***b) Four Main Components Of Changes In Taxpayer Compliance<sup>20</sup>***

68. As an example, a program initiative likely to be the subject of much interest is *an increase* in the number of audits conducted within a particular taxpayer population. It is assumed that the higher level of audits is targeted at large business taxpayers and maintained for (say) three years and then subject to an *impact evaluation* in its fourth year. We further assume that specific audit resources are allocated to the new initiative, and that the other existing audit resources are used in the usual way. The objective is to see what the overall impact of these additional audits has been on compliance in that population.

69. From a revenue perspective, it will not be sufficient to measure and compare compliance in Years 0 and 4 only. This is because the revenue benefits of an increase in compliance can be expected to be cumulative and not just 'one-off' in nature.

**Figure 3: A Revenue Impact Matrix<sup>21</sup>**

Source of additional revenue •	Type of revenue effect	Timing of revenue effect	Year 1	Year 2	Year 3	Year 4
Audited Taxpayers	Direct (D)	First (F)	DF <sub>1</sub> ↘	DF <sub>2</sub> ↘	DF <sub>3</sub> ↘	DF <sub>4</sub> ↘
Audited Taxpayers	Direct (D)	Subsequent (S)		DS <sub>2</sub> →	DS <sub>3</sub> →	DS <sub>4</sub> →

<sup>18</sup> See also Long and Burham (1990a, 1990b)

<sup>19</sup> See Weiss and Rein (1969) for an exposition of the general pitfalls of evaluating broadly based programs.

<sup>20</sup> The comments in this section focus, perhaps narrowly, on taxpayer compliance pre and post audit activity. The logic, though, would be equally applicable to compliance improvement initiatives of a non-audit nature.

<sup>21</sup> See footnote above. For the first two entries in column one, the source of additional revenue may not be from audit activity but rather from another compliance activity. The matrix is equally valid to such non-audit activity.

Other Taxpayers	Indirect (I)	First (F)	IF <sub>1</sub> ↘	IF <sub>2</sub> ↘	IF <sub>3</sub> ↘	IF <sub>4</sub> ↘
Other Taxpayers	Indirect (I)	Subsequent (S)		IS <sub>2</sub> →	IS <sub>3</sub> →	IS <sub>4</sub> →

70. There are four main possible sources of the additional revenue.

71. First, there is the initial or first (F) amount of additional revenue raised directly (D) from those additional non-compliant taxpayers brought to account by the compliance improvement strategy. The main measurement challenge confronting the tax administration here is being able to identify the extent to which the debit raised is actually converted into additional tax *collected*. In practice, given the nature and complexity of the various tax administration data bases that need to be interrogated, this is by no means a trivial challenge. This additional revenue is identified in Figure 1 as DF<sub>1,...4</sub> (the subscripts refer to the years involved).

72. Secondly, account needs to be taken of the expected subsequent sustained (S) improvement in compliance by these audited<sup>22</sup> taxpayers. As already indicated, even if these taxpayers were to be reaudited, account would need to be taken of a number of 'index number' problems when measuring any increase in compliance. Clearly, the difficulty of obtaining a reliable measure here is compounded if it has to be based only on unaudited tax return data. This additional subsequent revenue is identified in figure 1 as DS<sub>2,...4</sub>.

73. One of the major roles conventionally expected of taxpayer audit programs is the deterrence of non-compliance by potentially non-compliant taxpayers. This deterrence based additional source of revenue, usually described as enhanced 'voluntary' compliance, also needs to be taken into account. A further program of random audits conducted on an annual basis or an appropriate analysis of tax returns over the relevant time period is required to obtain statistically based estimates of this revenue effect. The first amounts of this indirect source of additional revenue are identified as IF<sub>1,...4</sub>.

74. It should be noted here that one of the implications of the conventional deterrence literature is that a positive IF or first indirect revenue effect will be obtained only when there is an increase in the rate of auditing. However, the literature is generally silent on the issue of the likely lag between when the audit rate is increased and when the IF effect is likely to be observed. For example, one possible factor here would be the timing of any additional publicity given to the prosecution of tax evaders (there may be a significant elapse of time before these cases come to court). For simplicity, in Figure 1 the assumed IF effect is spread over the full four-year period.

75. Finally, following on from the first indirect (IF) revenue effect, allowance has to be made for the expected subsequent sustained improvement in compliance by these unaudited taxpayers. This additional revenue can be identified as IS<sub>2,...4</sub>.

76. To date, several attempts have been made to estimate the DS, IF or IS effects but these have almost all focussed on individual income tax. The latest such study<sup>23</sup>, conducted by the IRS, has found that audits and certain other activities have a significant, positive impact on the lodging and reporting compliance behaviour of the general population. However, for most other tax administrations, even obtaining reliable estimates for the revenue raised directly from audits (the DF effect) has proved a major hurdle.

### General Comment on the Future

77. While this paper endeavours to cover the writings and the major research done to date, it also strives to highlight the need for more research in the future - especially in the area of large corporate behaviour, and to encourage both the undertaking and sharing of such research.

<sup>22</sup> See two preceding footnotes

<sup>23</sup> Refer to IRS Publication 1916 (Rev 11-96) "The Determinants of Individual Income Tax Compliance"

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## Available Writings and Research

78. In the area of compliance measurement, a significant amount of work is from researchers outside of the taxation administrations. The commissioning of pertinent research to date is limited to a relatively few administrations, though the issues are significant for many. Further there may be increasing need for multilateral studies to measure the behaviour of multinational entities or those which operate via global networks such as the Internet. Seemingly, there are greater opportunities for closer co-operation between academia and tax administrations, and, of course, amongst national tax administrations via forums such as the OECD.

### Key Corporate Objective: Improving Compliance

79. Today, many tax administrations have within their corporate objectives or goals *the improvement of taxpayer compliance*. Potentially, these administrations may have difficulty in establishing their performance against this objective - especially so if there is no effective way of measuring any move in compliance levels over time. It is expected that many administrations currently measure the effectiveness of their compliance improvement strategies solely on revenue return, which is, of course, **not** synonymous with compliance improvement. For the future, such administrations need to develop ways to measure trends in taxpayer compliance to measure their overall effectiveness.

### Reworking Old Models & Other Problems

80. In the main, ongoing research into measuring taxpayer compliance has focused on *reworking old models*, arguably with a disposition to audit based studies. We need to consider whether it is appropriate to continue with this reworking, or is it as Long and Swingen suggest (1991: 664), that "(w)e need to search for new innovative approaches and identify strategic situations where better measures could be developed or found, building in comparisons among methods and measures along the way."?

81. Currently, research on compliance measurement seems to have a number of weak spots which present opportunities for more or different research work, notably, research -

- on measuring compliance for large corporate entities or groups, especially those operating on a global basis; and
- into international comparisons as nearly all researchers to date have focussed on single country tax regimes<sup>24</sup>.

(International collaboration in assessing the risks attributable to specific multinational entities, and measuring their levels of compliance may be essential in minimising the potential for these entities to exploit jurisdictional differences.)

82. Further, greater general improvement in both *data availability and data quality* are needed.

### Sharing Experiences

83. OECD Members need to continue to explore ways of sharing experiences and of contributing to ongoing research into compliance measurement. Recommended possibilities include -

- the establishment of a forum within the OECD (utilising, for example, the EDG facility) for exchanges;
- the sharing of data and information on developments through existing treaty based channels;
- active networking and sponsorship to promote research activity; and
- the presentation of papers looking further at the issues, problems, successes and areas for further research.

84. To paraphrase a relevant report<sup>25</sup>, our base factual knowledge about taxpayers' compliance with the tax laws is small compared with the importance of the phenomenon. Given this gap, we should be able to improve our understanding of

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<sup>24</sup> The sole exception to this seems to be a study by Schmolders (1970) whose study was based on large samples (>1,000) in the UK, France, Spain and Italy and was conducted to find out more about taxpayer mentality, tension, feelings, and morale. Results were compared to earlier studies carried out in Germany.

taxpayer compliance (and hence be better able to design appropriate responses) in a very cost-effective manner. It seems this may be best advanced through broadly based research across an intellectually exciting community of researchers extending across tax administrations, academia and other interested parties.

### **In Conclusion**

85. To conclude, there is a real operational and policy need **now** and into the future for a greater focus on the important strategic issue of *Compliance Measurement*. This can be especially so given many administrations' corporate objectives and the fact that many administrations exist in an environment of needing to constantly improve compliance and maximise administrative efficiencies.

### **Guidance**

- 1. Revenue authorities *are encouraged to* conduct and report on research on Compliance Measurement**
- 2. Revenue authorities *are encouraged to* share the results of research on Compliance Measurement with other Revenue authorities.**

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## Appendix A: Financial Statement Analysis

### Horizontal Analysis

Horizontal Analysis is the study of changes in comparative financial statements from year to year. It highlights percentage changes in an item over time. The percentage change is calculated by dividing the dollar amount of the change by the base year amount. Percentage changes must be evaluated in terms of the item's relative importance to the company as a whole. Percentage changes are not calculated where the base year amount is either zero or negative.

A comparative **profit and loss statement** shows changes in sales, investment income, selling & administrative expenses, gross & net profits, etc. A comparative **balance sheet** will show changes in assets, investments, borrowings (long and short term), inventories, creditors, capital, etc.

**Trend percentages** are an important form of horizontal analysis. They are important indicators of the direction a business is taking. To gain a realistic view of the company, it is often necessary to examine more than just a 2 or 3 year period (5 years is usual). The item in the base year assumes 100%, and each subsequent year item is expressed as a percentage of that base amount.

### Vertical Analysis

Vertical Analysis of a financial statement reveals the relationship of each statement item to the total (usually net sales & total assets), which is the 100% figure. Again, percentage changes must be evaluated in terms of the item's relative importance to the company as a whole.

Percentages on the **profit and loss statement** are computed by dividing all amounts by net sales. The gross profit percentage is one of the most important pieces of information in financial analysis because it shows the relationship between net sales and cost of goods sold. A company that can steadily increase its gross profit percentage over a long period is more likely to succeed than a business whose gross profit percentage is steadily declining.

The **vertical analysis** of the balance sheet shows all amounts as a percentage of total assets or the sum of liabilities and shareholder's equity. A decrease in current assets may make it difficult for the company to pay its bills.

### Ratio Analysis

Ratios are important tools for financial analysis. Ratios provide a means of converting raw figures into figures that can be compared for the one entity over a period of years and compared with ratios calculated for the industry (often readily provided by external information services).

Some type of ratio comparative analysis could be developed on the population of a particular industry. Traditional accounting ratios can be calculated and obtained from Annual reports, External industry surveys, Analytical reports and usually external and internal databases. The ratio analysis process can:

- Develop an understanding of performance of an industry.
- Compare operations/performance of corporate groups against industry benchmarks.
- Be used to make a comparative analysis over a period of time.
- Confirm or assist in the risk assessment process.

One method is to use "**Profitability Ratios**" to allow for comparison against industry averages. In respect to corporate groups that can be aligned to an industry use Annual reports, or other financial data to calculate the following ratios:-

**Gross Profit Margin**  $[\text{gross profit/sales}] \times 100\%$

This ratio is from the vertical analysis of the profit and loss statement. This measures the level of profit being made on sales. Those businesses depending on high volume will have low gross margins and those depending on margin should have higher gross margins. The higher the rate of return, the more net sales dollars are providing profit to the business and the fewer net sales dollars are absorbed by expenses. Gross profit is net sales less COGS. This ratio does not include selling, administrative or financial expenses.

Analysis of the profit margin depends on the industry involved. For example, it is expected that a supermarket chain would have a low profit margin as the turnover of goods is very large and sales volumes are high, whereas an aircraft manufacturer would have a higher profit margin with lower turnover of sales.

**Net Profit Margin**  $[\text{net profit/sales}] \times 100\%$

This ratio is also from the vertical analysis of the profit and loss statement. Net profit is gross profit less selling, administrative and financial expenses. It calculates the proportion of each dollar of sales that represents net profit. The rate should be compared with other companies or an industry average to be more useful.

**Berry Ratio**  $[(\text{sales} - \text{cost of sales})/\text{operating expenses}] \times 100\%$

The Berry Ratio gives an indication of the profitability of a company. It tells you the proportion of gross profit that is available to cover operating expenses. A ratio lower than 100% is poor as it means the company is unable to cover its expenses. It may mean a market penetration strategy is in place. Berry ratios below 100% are not sustainable in the long term and these companies would need to be closely examined, particularly their pricing and marketing strategies.

**EBIT Margin**  $[\text{operating profit before tax} + \text{interest}]/\text{sales} \times 100\%$

EBIT is a commonly used profit measurement. It measures the profit earned independently of how an entity is financed and so makes profit more comparable between entities with different financing structures. Again, losses are not sustainable in the long term. A careful examination of pricing and marketing strategies would be warranted if the company is returning EBIT lower than the industry average.

**Return on Assets**  $[(\text{net profit} + \text{interest})/\text{average total assets}] \times 100\%$

This ratio measures the success a company has in using its assets to earn a profit. A rule of thumb comparison is to compare it with the rate of interest which could be earned if all the assets were converted into cash and placed on deposit. Acceptable levels of ROA will vary between industries. Some industries require significant in assets to generate profit (i.e. mining), while others probably do not need to acquire many assets. The reasonability of the ROA should be compared with industry averages.

The use of both net profit and EBIT ratios, reflecting results before and after financing costs, may help to explain the differences caused by their respective debt levels.

All or some of these ratios would be calculated on the population of the particular industry or group of similar industries. This population would be ranked and grouped into quartiles for that industry or comparable industries. The industry average of the above ratios should come from the 25% to 75% range.

The comparison of the bottom 25% to the industry average would give us the first cut of high to low risk companies. Judgement must be used to ascertain why a corporate ranks in the lowest quartile of a particular industry and/or lowly compared to the industry average. Some explanations could include:

- The corporate has a history of bad management
- The corporate has a market penetration strategy.
- The corporate is new to a particular industry.
- The corporate is heavily involved in R&D, capital expansion and/or promotion.

Further ratio analysis could include "**Capital Structure Ratios.**"

- Gearing %       $\text{Debt} / \text{Debt} + \text{Equity} \times 100\%$
- Net Debt / equity  $\times 100\%$
- Net Interest Cover       $\text{EBIT} / \text{Net Interest and Finance Lease Charges}$

Other ratios more directly related to taxable incomes include:-

- Taxable Income / Shareholder's Funds
- Effective Tax Rate (NB: care must be taken as there is many variations of effective tax rates. Current year tax provisions should not be used. Where tax is paid in a subsequent period, but is not readily available through internal accounting systems, a reasonable estimate may be made by using the tax paid figure from the sources and applications section of a corporate's published accounts in year X + 1, and compare that to accounting profits before tax in year X.)
- Operating Net Profit / Shareholder's Funds **less** taxable income / Shareholder's Funds
- Net Profit less taxable income / Net Profit  $\times 100\%$

**Other possible ratios include :-**

Gross Profit/Total Operating Income

Earning before Tax / Total Operating Income ( excluding proceeds from non-current assets)

Net Profit / Total Turnover of *Domestic company* **compared** to Net Profit / Total Turnover of *offshore companies* within the same group.

Taxable Income\* / Total Income

(Net Profit - Taxable income) / Net Profit

(Net Profit / TOI\*\*) - (Taxable Income / TOI)

\* Excludes carried forward losses and intra group dividends

\*\* Total Operating Income

The most appropriate type of ratio will vary depending on the type of industry and the area of risk that needs to be confirmed.

### **Limitations**

Ratios need to be evaluated in the light of other information about the company and its business (i.e. increased competition, slowdown in economy, etc). Ratios may indicate that something is unusual, but will not be able to provide any detail of what it may be or how to address it. Ratios can be misleading because of many mitigating factors, therefore a full analysis of the ratio result is necessary if it is relied upon to validate, confirm or indicate a risk assessment finding.

## History

**June 1999:** Initially released in June 1999 for comment as a Secretariat note, “Compliance Measurement” [DAFF/CFA(99)51] is one of the tax administration papers prepared for the CFAs Forum on Strategic Management (FSM).

At its meeting in December 2000 the FSM Steering group agreed to the tax administration papers series being made available as public documents. This was endorsed by the CFA at their meeting in January 2001.

**May 2001:** The paper is published as part of the “Tax Guidance Series” from the Centre for Tax Policy and Administration.

## Compatibility

The principles in this document are compatible with those contained in:

- **GAP001 Principles of Good Tax Administration**

Centre for Tax Policy and Administration, OECD 2001

- **Minimum necessary attributes for a sound and effective tax administration**

A charter-document approved by the Inter-American Center of Tax Administrations/ Centro Interamericano de Administraciones Tributarias (CIAT) General Assembly held in the Dominican Republic on March 19, 1996  
[http://www.oecd.org/DAF/FSM/minimumatributesta\\_ciat.html](http://www.oecd.org/DAF/FSM/minimumatributesta_ciat.html)

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