

# Behavioural Insights in Tax Administration

Shibanka Das Biswas

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# Behavioural Insights in Tax Administration

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## Abstract

This paper attempts to first understand tax non-compliance by using publicly available data. The attempt is then to look at the traditional economic models on tax compliance and the factors that influence them. While the traditional economic models advocate an increase in the probability of audit and enforcement as one of the main factors that influence compliance, the paper explores the Slippery Slope Framework, which brings in the dimension of trust. This provides a segue to the discussion on how with the advent of behavioural economic studies, the behavioural element in tax compliance is also being explored. The paper discusses various interventions that can alter taxpayers' behaviour and discusses the literature behind those. The paper also discusses examples of successful behavioural interventions around the world. Assuming a dynamic taxpayer response, the paper also explores a game theory setup of a coordination game and how the tax department should counter that. Based on the discussion, the paper concludes with some policy suggestions.

*Keywords:* Tax-compliance, the economics of crime, behavioural economics, game theory, interventions



# 1. Introduction

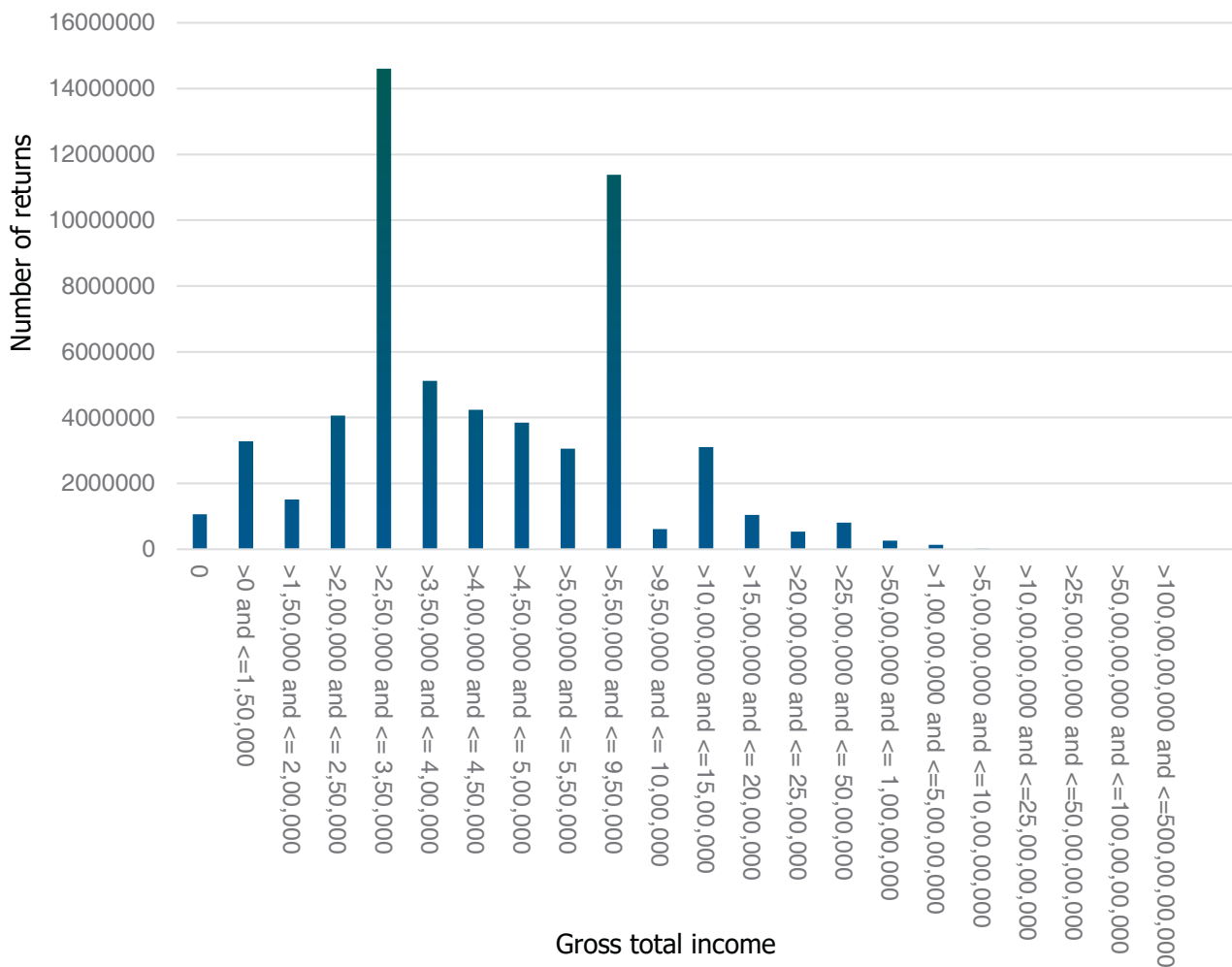
India is one of the most prominent economies in the world today, with one of the highest GDPs in absolute terms. However, the per capita figures are worrisome. Tax revenue and economic growth have a circular relationship. The importance of a buoyant tax revenue collection system cannot be undermined given the circular relationship between tax revenue and economic growth. With an increase in tax revenue, the government's ability to spend enhances, which has a positive effect on the economy leading to an increase in the income levels in the country.

The tax-to-GDP ratio of India stood at less than 12% and the direct tax to GDP ratio stood at 6.1% as per the official press release by the government for FY 2021-22 (Ministry of Finance, 2022). For the sake of perspective, the average for OECD countries is 34%. The low tax-to-GDP ratio is a matter of concern that would need to be addressed by the tax administration to be the protagonist of India's growth story.

In Section 2, the paper analyses the data obtained from the Income Tax Department's website to understand the compliance related issues in the Indian context. In Section 3, the paper looks at the various kinds of economic models that have been propounded to understand and change compliance behaviour. Part 3.1 of the section deals with the Economics-of-crime Model and Expected Utility Theory, and in Part 3.2 the extension studies based on these, act as segue into Part 3.3 on understanding how enforcement can affect compliance behaviour. Section 4 discusses empirical studies on enforcement influencing compliance behaviour. In Section 5, the paper discusses the evolution of the Behavioural Economics model on tax compliance and follows it up with empirical studies on this model in Section 6. Section 7 looks at experiments carried out by tax administrations all over the world and lists out suggestions on the interventions that can be done. In Section 8, the paper seeks to apply Game Theory to understand how the taxpayer can game the tax system and what can the tax administration do about it. In Sections 9 and 10, the paper is concluded with policy suggestions and suggested way forward for the Indian tax administration to apply behavioural insights to enhance tax revenue.

## 2. Tax Compliance in India—What the Data Reveals

For this section, the author relies upon secondary data publicly available on the official website of the Income-tax Department (<https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>). For the assessment year 2018-19, the total number of returns filed was 5.87 crores. The population of India in 2018 was around 138 crores implying that merely 4.2% of the population filed returns. An interesting statistic is the distribution of gross total income shown in these returns. The data is annexed as Table 1. The visual depiction is as below in Figure 1.

**FIGURE 1:** Distribution of the number of returns for various ranges of Gross Total Income

Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

Now, it gets even more interesting when one looks at the distribution of tax payable vis-a-vis the number of returns on the official website. The distribution of tax payable can be looked at in terms of three categories of taxpayers. The first category is those that pay NIL taxes. It may be seen that out of the total tax payable of INR8.07 lakh crore, 2.37 crore filers of the 5.87 crore filers, i.e., 40.37% paid NIL tax. This is represented by the population on the first four bars on Figure 1 above. Generally, these people file their gross income close to the taxable threshold and slip below after claiming deductions. For the purpose of this paper, one could call them the ‘fence sitters’ (more discussion on them later in this paper).

The middle category of 3.44 crore taxpayers out of 5.87 crore filers, i.e., 58.6% of the return filers fall within the tax payment range of more than NIL but less than INR 10 lakhs.

The total tax paid by these 58.6% is INR1.94 lakh crore, i.e., only 24% of the total taxes. This bracket largely comprises salaried people or small businesses. Thus, over 75% of the direct tax revenue results from the remaining 1.2% of the returns.

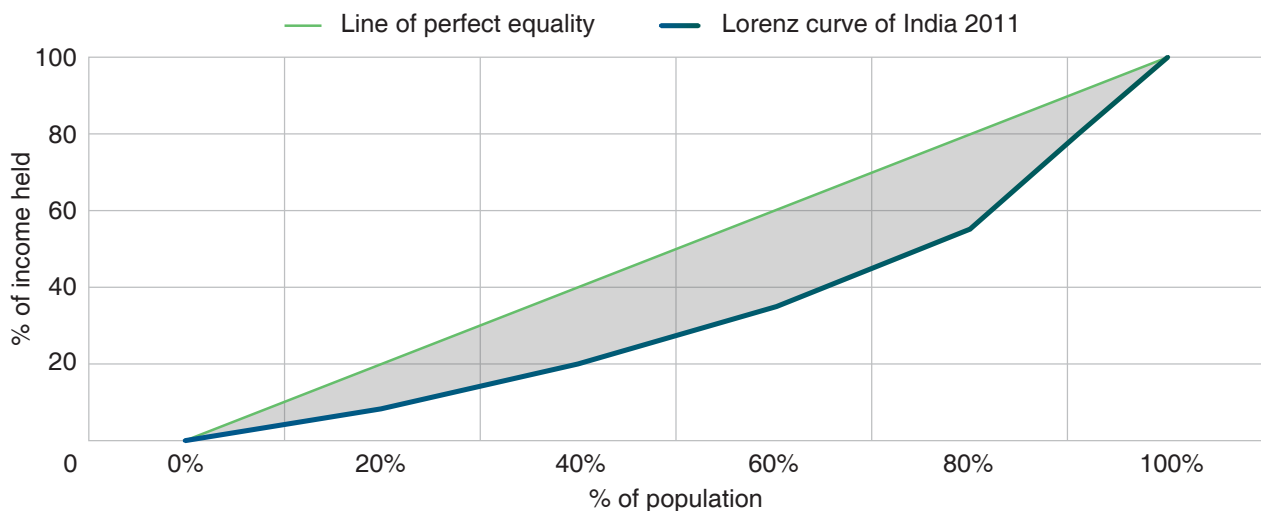
The above data analysis intuitively generates four broad return filers/taxpayers' categories.

- i. Non-filers
- ii. 40.37 % of filers who are not paying any tax
- iii. 58.6 % of filers paying tax but less than INR10 lakhs
- iv. 1.2 % of filers pay 75% of the tax revenue

The question now arises whether this skewed behaviour is because of the skewed distribution of wealth/income or because of non-compliance. The Lorenz Curve and Gini coefficient are good measures of income distribution and have been traditionally used for comparing income distribution across geographies and times. The Gini coefficient measures the extent to which the distribution of income in an economy deviates from perfectly equal distribution. The cumulative percentage of total income is plotted against the cumulative percentage of the population, the resulting curve is known as the Lorenz Curve. The Gini coefficient or index measures the area between the Lorenz Curve and a hypothetical 45-degree representing perfect equality as a percentage of area under the hypothetical line. A Gini coefficient of 0 represents perfect equality, and of 1 means perfect inequality.

The Gini Coefficient of India is close to 0.36 per the latest official data from the World Bank (World Bank, 2011). There are other estimates from some research agencies of recent years indicating that the figure has gone up in subsequent years, but the paper relies on the World Bank data of 2011 for now. The corresponding Lorenz Curve is plotted below. The shaded area represents the deviation from the line of perfect equality.

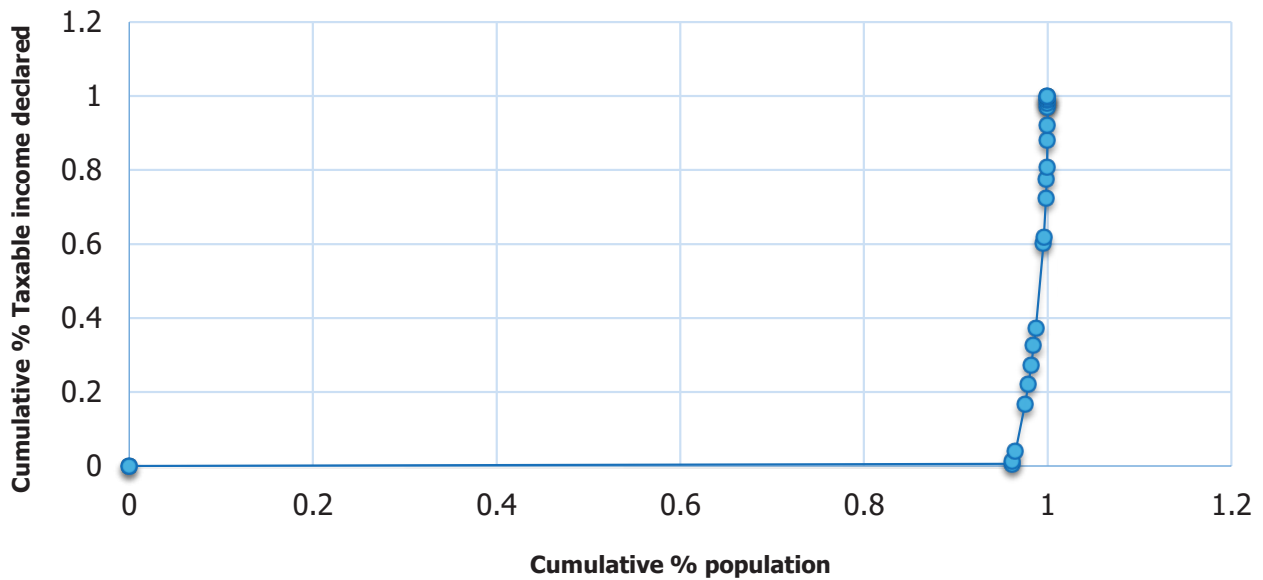
**FIGURE 2:** India's Lorenz Curve plotted as per World Bank data of 2011



Note: Figure created by author using data from Knoema (2020). Gini coefficient and Lorenz curve around the world. Retrieved from <https://knoema.com/crmndag/gini-coefficient-and-lorenz-curve-around-the-world?country=India&%ADTime=2011-2016>

In this context, a good proxy for measuring the extent of tax non-compliant behaviour would be to qualitatively compare the Lorenz curve of tax distribution overpopulation to that in Figure 2. The same is plotted below based on the Assessment Year (AY) 2018-19 data publicly available on the Income-tax Department website. The data for this chart is placed in Table 2.

**FIGURE 3:** Lorenz Curve distribution of declared Income-population based on data on returned income as published by the Income-tax Department



Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

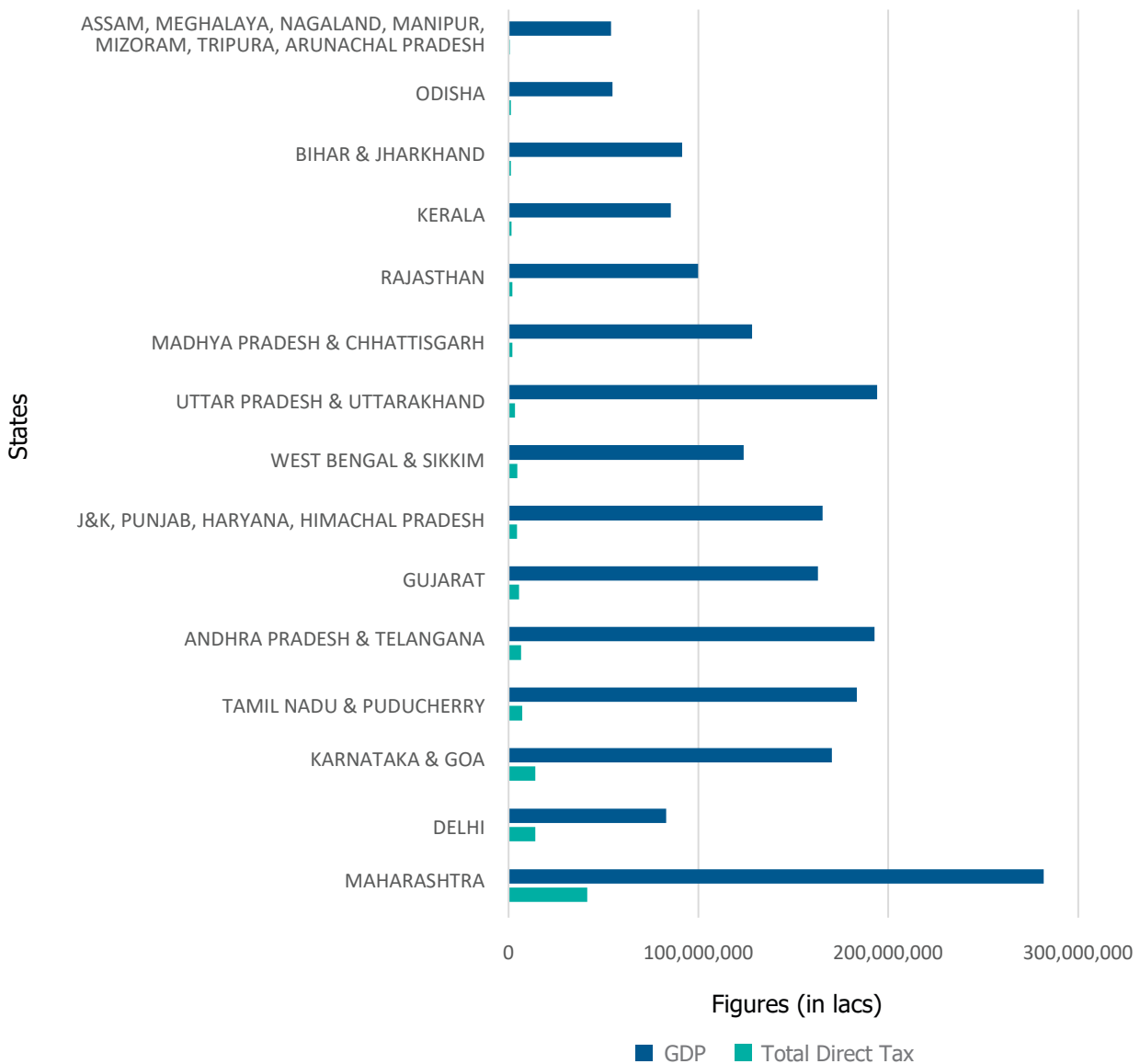
The deviation in the two curves is quite stark. While Figure 2 shows a more even distribution of wealth/income, Figure 3 denotes that only 4% of the population pays almost the entirety of the personal income tax. While part of the deviation can be explained by exemptions and deductions claimed, such a stark deviation indicates non-compliance.

This is further supported by the data distribution, as shown in Figure 1. Two noticeable aspects in Figure 1 above are the taller bars which distort a normal distribution. These bars are close to the tax slab thresholds. Please note that the incomes are gross incomes, i.e., before the claim of deductions. After claiming the permissible amount of deductions, the incomes would fall below the relevant tax slabs. The population corresponding to the first bar on the left would fall into the NIL tax slab, and those corresponding to the second bar would fall into the next lower slab.

The significant amount of non-compliance has also been highlighted by the 15th Finance Commission (2019), which has pegged the tax gap at 5% of GDP. This is a significant amount considering that the entire direct tax collection of the Government of India is close to that figure.

In analysing compliance vis-a-vis GDP, another comparison was done to see the state-wise direct tax collection vis-vis the state-wise GDP data. The detailed state-wise direct tax collection data was private, so the budget targets for FY 2021-22 which are proportional to collections over earlier years, were compared to the state-wise GDP data. The figures are placed in Table 3. The visual depiction is as below. The same units for both GDP and tax collection have been taken.

**FIGURE 4:** Tax collection of states vis-à-vis the GDP figures



Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

The above figure depicts the stark difference in GDP, i.e., productivity and the corresponding direct tax figures of the states. The direct tax figures of the five states in the above figure are buoyed by the five major cities: Mumbai, Delhi, Bengaluru, Chennai, and Hyderabad, represented by the small teal bars against the towering bars of blue. This implies that in other states which have smaller cities or towns, the compliance is not commensurate with the economic activity and, concerted efforts need to be made with a geographical focus to enhance compliance.

This non-compliant behaviour has a simple explanation. Humans are generally “loss averse” and would make a choice to minimise losses. In this case, payment of tax is viewed as a loss and hence this behaviour. The strategies to tackle this sort of behaviour would vary depending upon the nature of the taxpayer. It may be recalled that based on the filing behaviour, taxpayers were divided into the four

categories above. The interventions for each of those categories would be different as discussed later in this paper.

Before getting into the interventions, one needs to understand more about compliance behaviour. The discussion above shows that non-compliance exists, it is now important to understand the underlying factors that cause tax compliance or non-compliance. There have been various economic models which have evolved over the years. The next section examines these various economic models of tax compliance and how they have evolved over time to the behavioural economics-based model.

## 3. Economic Models for Tax Compliance-Rationale for Enforcement

### 3.1 Utility-Payoff Model of Tax Compliance

The first fundamental theory of tax compliance started with the economics of crime model of Becker in 1968 (Allingham & Sandmo, 1972) propounded the utility theory of tax compliance. This has been the seminal work in tax compliance study using economic theory and has spawned wide branch off study in the subject. The Allingham-Sandmo model of tax compliance viewed tax compliance from a utility pay-off perspective. Simply put, this model of tax compliance propounds that an individual essentially pays tax because of fear of getting caught and penalised. As per the model, this is subject to the probability of detection by the tax authorities. This model gives us numerical relation between compliance and penalty rates as well as the probability of audit. Let us briefly look at this model to set the context for the rest of the paper.

Say, a taxpayer earns Income  $I$  and reports  $R$ , where  $R \leq I$ . Let us assume the rate of tax is  $t$  and the penalty over and above the tax on detection of tax evasion by the tax authorities is  $f$ . The utility of tax evasion if undetected is  $U(\text{undetected}) = I - tR$ . In case the evasion is detected the utility is  $U(\text{detected}) = I - tI - f(I-R)$ .

The expected utility is  $EU(I) = p * U [U(\text{detected})] + (1-p) * U [U(\text{undetected})]$ , where  $p$  is the probability of detection.

Therefore, this economics-of-crime approach has the reasonable deduction that compliance depends on enforcement. In fact, it is important to recognise that this approach concludes that individuals pay taxes because of, and only for, the economic consequences of detection and punishment. This is an important finding, and it is clearly concluded that governments can help improve tax compliance by increasing audit and penalty rates.

There have been various follow up studies that tried to empirically establish this theory, but deviations were found. One of the strongest predictions of this theory is that tax compliance would increase with tax rate (Yitzhaki, 1974). This, however, seems counter to basic intuition and was also seen to be contrary to empirical evidence. Even the inverted U of the Laffer Curve suggests that tax compliance increases initially only to later decrease with tax rates.

Even more problematic is another prediction of the Standard Model which is that compliance is promoted solely by the financial considerations generated by the level of enforcement. However, a

simple cost-benefit analysis is not enough to explain compliance behaviour. The percentage of returns subject to tax audit is generally very low. In India, it is much less than 1% of the returns filed, and most of such returns are picked up for audit on limited issues. Further, the penalty rates are generally like the amount of taxes and seldom stand the test of appeals (CAG, 2020). Thus, the deterrence is quite low and based on the predictions of the rational economic model, the compliance levels for anyone whose information is not reported through third party information such as TDS, the income should be under-reported. In large parts because of these (and other) concerns, there have been numerous efforts to extend the basic economics-of-crime model of tax compliance. These efforts can be usefully classified in several ways, as discussed next.

### **3.2 Economics-of-Crime Model and Expected Utility Theory: Extension Studies**

The various extensions of the basic expected utility framework of the economics-of-crime model add various real-life factors. For example, the effect of withholding tax information from third parties (Kleven & Schultz, 2014); the effect of positive (individual) rewards for honesty (e.g., eligibility for a lottery if found to be compliant) (Falkinger & Walther, 1991); endogenous audit selection rules that utilise information from tax returns to determine strategically whom to audit affects compliance (Kuchumova, 2017); and the likes.

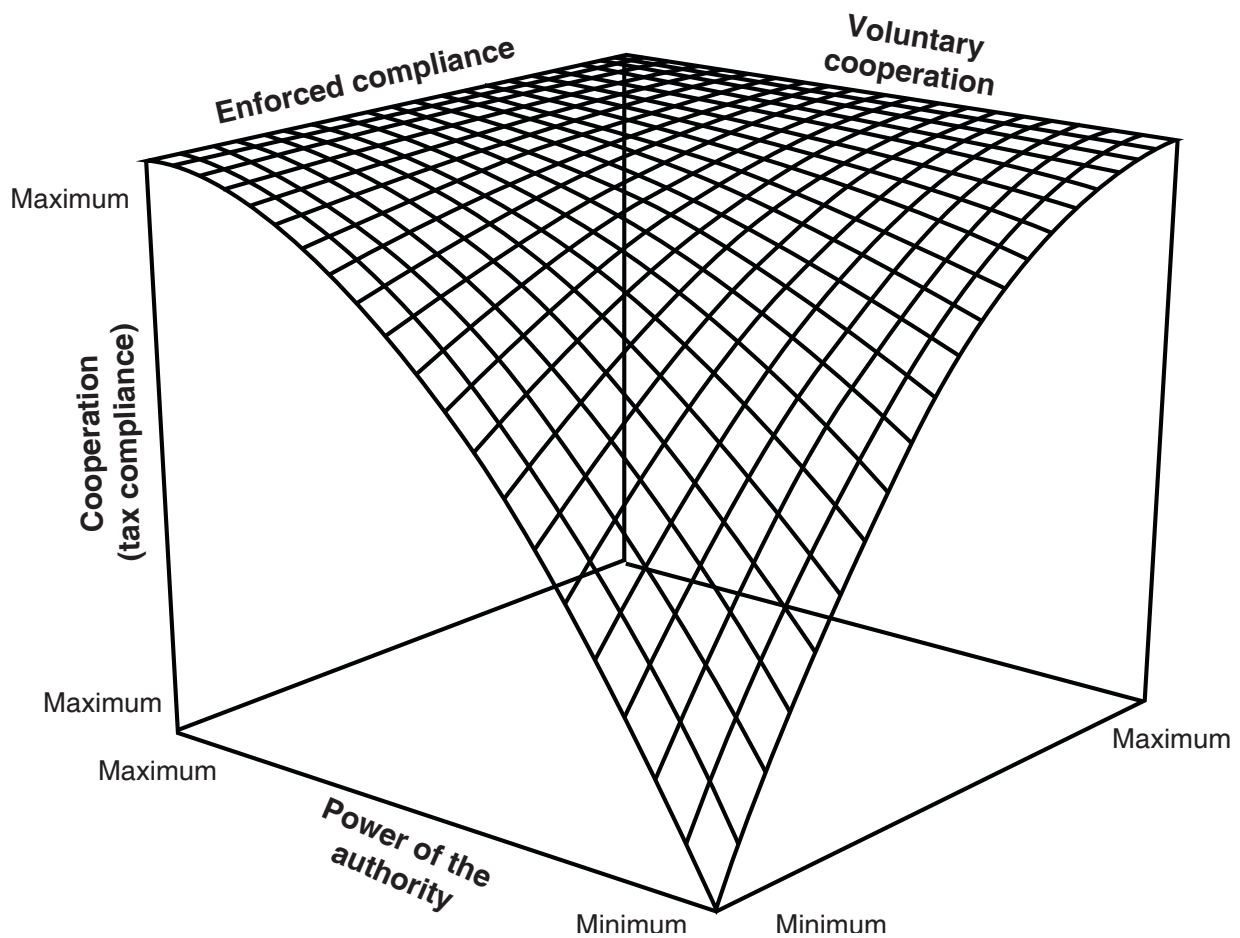
These extensions complicate the comparative statics of the tax compliance choice, with the endeavour of bringing predictions closer to observations. However, they conclude with enforcement as the main factor that motivates compliance.

Simons conducted an experiment to see the effect of varying audit probabilities and penalty rates. He found that increased audit probabilities have an effect only when penalty rates are kept at a high constant. Without varying the audit probabilities, the change in penalty rates has no effect. Thus, taxpayer behaviour adapts to changes in policy interventions which show deviations from the predictions of the neoclassical model.

The enforcement paradigm of tax-compliance as propounded by the rational economics-of-crime model, was best challenged in the Slippery Slope Framework Theory, which added a dimension of trust which is explained in detail in the next paragraph.

### **3.3 Relation Between Enforcement and Compliance**

Increased enforcement would increase the perception of probability of audit as well. This has been the rationale of the economics-of-crime model and empirically found to be strongly correlated in (Das-Gupta et al., 1995) wherein they found in their time series regression study of compliance that compliance had spiked in 1975-76 and 1985-86. Both were eras of stepped-up enforcement efforts by the Income-tax Department. However, one needs to be cautious here. As per the Slippery Slope Framework (SSF) of tax compliance, compliance is a function of both power of authority (enforcement) and trust in authority (correct targeting of enforcement). While the former would yield forced compliance, general trust leads to enhanced voluntary compliance. The SSF postulates that both enforcement and trust are required. While positive interaction with the taxpayer such as delivering of taxpayer services effectively is one way of increasing trust, a more effective way is to be just and appear so (Figure 5).

**FIGURE 5:** Slippery Slope Framework

Note: Figure adapted from Gangl, Hofmann, and Kirchler (2015), *Slippery slope framework*. In *Tax authorities' interaction with taxpayers: A conception of compliance in social dilemmas by power and trust*. *New Ideas in Psychology*, 37, 13-23. Retrieved from <https://doi.org/10.1016/j.newideapsych.2014.12.001>

In the SSF theory, the authors, Kirchler et al., (2010) also talks of 'legitimate power' and how that builds trust. Legitimate power is the ability of the tax system to understand and apply the tax laws correctly and effectively. While there is no direct measure of doing that, our success at the appellate stages can act as a good proxy.

As highlighted in the introduction section of this paper, there is massive income inequality in India. The Gini Coefficient is also increasing. Therefore, effective enforcement action towards significant evaders would build the trust of others and motivate them towards voluntary compliance.

There have been various empirical studies as well which demonstrate the effect of enforcement on taxpayer compliance behaviour. Some of these are discussed below.



## 4. Empirical Studies on Enforcement Influencing Compliance Behaviour

### 4.1 Audit Increases Compliance

There have been various empirical studies to show that compliance increases with audit. These have largely been of the nature of controlled field experiments since the effect of audit or any intervention for that matter cannot be isolated with precision from administrative data. There were various experiments that were considered for the purpose of this section and from the deductions of those experiments, the positive causal effect of audit on compliance stands well established. In the experiments, it has also been found that even informing individuals that they are likely to get audited has a significant effect on their compliance. (Slemrod et al., 2001; Torgler, 2007; Lewis, 1997)

It has also been seen that rather than random audit selection, strategic selection, especially using a cut-off rule has a better effect on compliance. The studies, however, do not clearly indicate whether the level of compliance would continue to sustain in the future based on audit selection. It can intuitively be stated that the level of compliance would depend upon the deterrence created through the audit. That is to say, the mere selection of a case for audit would not be sufficient, the quality of audit would significantly matter. At this juncture, it may be said that the quality of audit to a large extent would also depend upon the information base and use of data analytics to accurately detect anomalies. Therefore, for a good quality of audit, it is imperative that the selection of cases for audit is based on good quality of data.

### 4.2 Perception of Audit Is a Strong Influencer

The perception of the probability of audit should have a positive effect as hypothesised earlier. It has been found that individuals typically 'overweigh' the perception of audit. This, therefore, implies that small interventions by the Income tax Department to increase this perception of audit can have a much greater impact on compliance.

However, the Department needs to be careful as far as audit goes. There is something called as the 'Bomb Crater' effect which has been seen through some experiments.

It was observed in some of the experiments that compliance immediately drops after audit. In fact, a specific study found that the level of compliance tends to especially decrease in cases where no additional tax liability was determined even after the audit. The intuitive explanation is that the deterrence factor diminishes once an individual smoothly sails through the audit. Such taxpayers lose 'trust' in the enforcement capabilities of the Department.

This brings us again to the SSF that was seen earlier that there needs to be a balance between enforcement and trust. One practical way to counter this 'Bomb Crater' effect or sliding down the slippery slope is to target the audit selection carefully. The middle and high-income population should be subjected to audit selectively and that too based on robust risk analysis on quality data.

Thus, while substantial number of audits need to be carried out as indicated above, audits would have a greater effect if only those with a greater probability of levying additional taxes and fines are selected.

### 4.3 Fines Improve Compliance but Their Effect Is Small

The rational model of economics predicted a linear dependence of compliance on the rates of penalty or fine. However, empirical studies have shown that this is not the case. Fines do have an effect but not to the extent envisaged theoretically. The income-fine elasticity has been found to be around 0.1 (Chandarasorn, 2012).

A penalty can also be of non-financial kind. As propounded by studies around behavioural economics, individuals want to conform to social norms. Thus, measures such as *public disclosures* have also been found to have an effect. As far as public disclosures are concerned, one measure could be to make all the income/tax filed data public. High Net worth Individuals (HNIs) can be frequently seen publicising with 'pride' the high amount of advance tax they deposit. Making the information public could trigger this 'social conformance' and influence taxpayers to declare higher (correct) income. However, there are privacy and data protection issues that need to be examined in this regard. To start with, however, the Department could publicise the information on tax defaulters above a certain threshold and audit cases successful in appeal as an annual feature.

## 5. From the Economics-of-Crime to Behavioural Economics

One central assumption in the above theory is the probability of audit. In the paper by Allingham & Sandmo (1972), it has been assumed that there is an absolute probability, and that the taxpayer is aware of this probability of audit, weighs his utility, and tries to maximise the same, accordingly.

However, tax administrations have complex ways of conducting risk analysis and picking up cases for audit and scrutiny. The US Internal Revenue Service (IRS) used the Discriminant Function (DIF) method (discussed later), and the Indian Income-tax Department used the Computer Aided Selection for Scrutiny (CASS). The probability of an audit cannot be known beforehand by the taxpayer, at the time of filing of return. Rather, assuming that the probability in the model is a perceived probability by the taxpayer would make more sense and opens an interesting new area of discussion.

With the understanding that the probability in the traditional model discussed above is a perceived one, one can enter the domain of human behaviour and how they make decisions under various circumstances. The basic premise of behavioural economics is that humans do not always act rationally but are susceptible to heuristics and biases. Following the seminal works of Kahneman, D (2011), Thaler (2008), Tversky & Kahneman (1974), the approach towards studying tax compliance behaviour also evolved. The new knowledge now became mainstream that human's resort to two types of thinking termed as System 1 and System 2 thinking as termed by Daniel Kahneman or Automatic and Reflective thinking as termed by Thaler. The findings from this approach are now almost unanimously accepted:

- » individuals find it difficult to compute (e.g., "bounded rationality")
- » they systematically misperceive the true costs of actions (e.g., "fiscal illusion", "overweighting" of probabilities "saliency")

- » they have limitations on “self-control” (e.g., “hyperbolic discounting”, automatic enrolment programs)
- » they are influenced by how choices are “framed” (e.g., “reference points”, “status quo bias”, “loss aversion”, “risk-seeking behaviour”)
- » they are affected by the social context (e.g., diversity), and the process (e.g., voting rules) by which decisions are made
- » individuals are motivated not by narrowly defined financial considerations, but also by notions whose origins are more from group considerations, such as fairness, altruism, reciprocity, empathy, trust, guilt, shame, morality, patriotism, social norms, “tax morale”, etc.

In short, individuals are not always rational, result-oriented, self-owned, and selfish consumers, as many standard theories imagine. Behavioural economics uses these deviations from standard assumptions as a starting point for a more realistic view of how individuals make decisions. Despite various criticisms of the behavioural approach, there is consensus that behavioural economics can help understand individual and group behaviours better. There have been various experiments towards increasing tax compliance using interventions based on behavioural economics around the world.

## **6. Influence of Behavioural Insights in Tax Compliance-Empirical Studies**

The above theory has also been put to empirical test as discussed below.

### **6.1 The Social Factors Matter**

It has been found through various studies that social factors and the environment in which the individual lives matter a lot in compliance. This has been demonstrated through various empirical studies in different social milieu (Alm et al., 1995; Cummings et al., 2009; Zhang et al., 2016). In general, attitudes toward tax evasion (e.g., “tax morale”) are influenced by the society in which an individual lives, which includes the trust in government and institutions (Alm & Torgler, 2006).

### **6.2 Information and Tax Compliance**

#### **6.2.1 Information available with the Department**

The importance of quality information was already indicated earlier. Compliance is far greater when income is subject to withholding and there are third-party information sources than on income not subject to these features. Withholding taxes at source vastly improves compliance (at least on items subject to withholding) (Internal Revenue Service, 2016a). Thus, there is merit in widening the basket of items under the ambit of withholding taxes. Presently, it is for very few transactions. Even the 15th Finance Commission has recommended increasing the ambit of TCS/TDS.

The availability of third-party information with the tax authorities also improves compliance (Adhikari et al., 2020; Keen & Slemrod, 2017). While information from third party sources is presently being collected by the Department which is also being used for pre-population, the effectiveness can be increased further by providing more pre-populated data. For that, data from various sources need to be collected. The difference between income shown in the returns and the expenditure being carried out by people depicts the extent of non-compliance. In this context, the use of GST data can come in handy. In India, withholding tax is generally not levied as the final tax on domestic payments to Indian tax residents. One of the reasons for collecting income tax through TDS / TCS is to first collect information about a particular transaction and use that information to track cases of unreported or underreported income. Such information is now available to the Income Tax Department from sources other than the TDS / TCS tax returns submitted by tax withholding taxpayers. A comprehensive GST database, securities custodian database, and collection of taxpayer transaction details from third parties give income tax authorities access to a wide range of taxpayer information without having to obtain a TDS / TCS tax return. The GST database is the most comprehensive database on expenditure related information currently available because it uses the same identifier (such as PAN) to retrieve all invoices between GST registered companies.

### **6.2.2 Information About the Tax System with the Public**

It has been found that higher audit rates have little impact on compliance if this ‘official’ information is not known to the public; if it is provided, higher audit rates increase compliance (Alm et al., 2009). There is, therefore, a case for publicising the effective audits carried out by the Department akin to publicising the searches and surveys as mentioned in paragraph 4.3. Giving individuals the impression that they will be “closely examined” (via a message) generally increases the compliance rate of these individuals (Slemrod et al., 2001). One way this can be done is through dynamic messaging. Targeted messaging to taxpayers that their return or profit is a deviation from other taxpayers in similar business or profession in the same geography, which can result in scrutiny, could ensure proper compliance. This can be done through a message at the time of filing of return. However, this sort of messaging cannot be generally sent to everyone but has to be accurately targeted based on real-time comparison with other returns.

It has also been seen that knowing what your “neighbours” are doing affects your own decisions. If one knows that the neighbours are cheating, the individual will tend to cheat, and vice versa (Alm et al., 2016). Therefore, the selection of audit cases and publicising of the audit can be done keeping the geography in mind as well to have a wider impact.

Further, the sharing of information across state and federal governments in the U.S. has been found to improve compliance (Alm et al., 1996; Troiano, 2017). While there are certain sources such as registrars and cooperative banks from which information is collected, other information in the possession of state governments which can have an effect on direct taxes can be collected.

One related theory to behavioural economics is the Game Theory which also can throw light on the dynamic relation between the taxpayer and the taxman. This will be discussed in Section 8.

## 7. Application of Behavioural Insights in Tax Administrations around the World

The initial paragraphs of this paper looked at the evolution of the economic models of tax compliance behaviour and the rise of behavioural sciences as a sound supplement to influencing compliance behaviour of taxpayers. Behavioural insights have been used in tax administrations around the world for various functions with successful results. The paper looks at some of those success stories for various functions in the paragraphs to follow.

### 7.1 Pre-Filing Behaviour

In 2016, the Norwegian Tax Administration increased revenue by \$25 million by trying different types of framing in the communication sent to taxpayers regarding tax declaration requirements. In 2015, Slovenian tax authorities experimented with the effects of messenger by mailing and delivering letters directly, increasing the tax base by 12.6% when letters were sent and delivering letters directly (the taxbase increased by 20.28%). In 2009, the Mexican tax authority, Service de Administration Tributaria (SAT) increased filing compliance from 67% to 80% through the loss aversion bias by issuing warning letters highlighting the risk of non-compliance (USAID, 2018).

### 7.2 Filing Behaviour – Voluntary Compliance

In 2016, Guatemala used behaviourally designed letters to increase revenue by \$760,000 which was 36 times the cost of sending letters. These letters used social norms, deliberate choice, and national pride. Behaviourally designed tax collection letters in Poland were used in 2015, appealing to social norms. This increased payments by 17 % (USAID, 2018). An important finding regarding audits was found in the U.S. A 2015 US study (Beer et al., 2015), found that no-change audit may have reduced reporting compliance. This was perhaps because the audit was viewed as unnecessary and burdensome, allowing taxpayers to justify subsequent non-compliance.

An interesting experiment was carried out in Costa Rica in 2014 (World Bank Group, 2021). This experiment looked at the effect of enforcement messaging on income tax filing and related compliance issues among 50,000 non-filers in Costa Rica. Non-filers included firms that were tax-registered but had not filed their income tax declaration for 2014. Two-thirds of the target firms were randomly selected to receive an enforcement email while the remaining received nothing. The messages contained three features- mentioning potential sanctions a taxpayer could be subject to, behaviourally informed messaging such as personalisation, simplification, and highlighting social norms and emphasising that reports from clients, suppliers, and financial service providers could be used to validate a non-complier's sales and spending. The intervention improved income tax compliance as expected. The income tax filing rate for 2014 increased by 20 percentage points within five weeks, filing rates increased by two additional percentage points for those who received a message mentioning examples of third-party information. This also led to improved accuracy in reporting from unincorporated businesses, which are notoriously evasion prone. Plus, firms that received an email became 2.5 percentage points more likely to file a third-party report about a client or supplier firm.

### 7.3 Behavioural Interventions for Collection of Tax Dues

In 2012, UK tax officials appealed to social norms through messages such as “9 out of 10 people in your town pay their taxes on time” to increase collection by £200 million (Thaler, 2013). In 2016, UK tried another experiment of using letters to appeal to public gains and losses thereby increasing the revenue by £9 million (Butler, 2016).

## 8. Can Taxpayers Coordinate to Game the Tax System

Behavioural influencing of taxpayers is dynamic in nature. Taxpayer behaviour changes as policies change and accordingly the interventions also have to change. It needs to be understood that despite the advent of behavioural economics, the postulates of rational economic theory are not completely unfounded. Individuals would still prefer not to pay taxes and, thus, there is a continuous game being played between the taxpayer and the tax system. One interesting aspect to look at would be whether taxpayers can coordinate to game the tax system, and if so, can the tax administration take measures to counter the same. The approach in this regard can be borrowed from the famous Game Theory propounded by John Nash.

Consider an interactive game between the taxpayer and the tax authority. The tax audit selection process is based on various audit parameters or flags. In the case of the Income Tax Department in India, this is done through a Computer Assisted Selection for Scrutiny (CASS) on the basis of identified parameters. Generally, selection is based on deviations from the norm. The Nash Equilibrium setup wherein taxpayers can coordinate with one another to game the tax administration would allow us to get useful insights into possible strategies for tax evasion and ways to counter them.

In a coordination game, the taxpayers can game the system if they report the same income. Let us consider two taxpayers A and B. Both earn an income of INR5. Let the tax rate be uniform 30% and the rate of penalty be the same. The Nash Equilibrium would be when both the taxpayers coordinate and report the same income. The payoffs for taxpayers are as below:

$$\text{Payoff (not-audited)} = \text{Income} - \text{Tax rate} \times \text{Declared Income}$$

$$\text{Payoff (audited)} = \text{Income} - \text{Tax rate} \times \text{Declared Income} - (\text{Penalty} + \text{Tax}) (\text{Income} - \text{Declared Income})$$

In a coordination game theory setup as described above, a taxpayer would not get audited if the declared income is same as the other taxpayer. If the declared income is less than that of other taxpayer, the case gets audited. The various scenarios of pay offs for Player A are depicted through the table below:

**FIGURE 6:** Example by author showing various scenarios of pay offs

		<b>Player B (Declared income)</b>					
		<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Player A (Declared income)</b>	<b>5</b>	3.5	3.5	3.5	3.5	3.5	3.5
	<b>4</b>	3.2	3.8	3.8	3.8	3.8	3.8
	<b>3</b>	2.9	2.9	4.1	4.1	4.1	4.1
	<b>2</b>	2.6	2.6	2.6	4.4	4.4	4.4
	<b>1</b>	2.3	2.3	2.3	2.3	4.7	4.7
	<b>0</b>	2	2	2	2	2	5

Source: Created by author

Thus, the best payoff for a taxpayer is when the taxpayer declares more than the other taxpayers or equal to them. Now the moot question is whether the taxpayers can coordinate and what the tax administration's strategy should be. Payoffs to the Row-Player (Player A) in the Discrete Strategy version of this game are as in the figure above. Payoffs to the column player (Player B) are symmetrical. The coordinated strategies of players A and B are shown in green. In this case, there is no dominant strategy and all combinations with equal reported income for all players is a Nash Equilibrium.

An empirical study in this context was done in the case of the US IRS. In the United States, the Internal Revenue Service (IRS) uses the results of past experience to develop the "discriminant index function" (DIF). They decide which tax return to audit based on the items reported on the current tax return. This formula estimates the "DIF score" of each return. The DIF score is behind the so-called "audit flag". People who deviate from the average raise a flag. It was found that when the US IRS uses a combination of DIF and non-DIF audit selection methods, the compliance levels are significantly high. i.e., have a selection of DIF score based cases and then fill the remaining audit quota with randomly selected cases based on certain criteria.

In the Indian context, such a coordination game might be possible within a small geographical setup. As discussed in the introduction section, there appears to be lower compliance in smaller cities. Certain types of businesses are typical to a geographical region, and it might not be very difficult for similar taxpayers within that region to coordinate through informal associations. For instance, iron and steel traders of various cities of Punjab such as Mandi Gobindgarh and Ludhiana could coordinate to ensure they manipulate their books of accounts to show a similar Gross Profit rate. There was an investigation by the Income tax Department in 2015 which revealed cartelisation by the pulses traders to artificially increase the market price of pulses. Not only was there unbridled profiteering from the exercise, but the cartel members also avoided taxation (Ghosh, 2017). This shows that such cartelisation is possible for pecuniary benefits.

Another example could be the bystander effect. This was discussed in the introduction section as well. This is the common passive behaviour manifested by humans with the impression that their own passive role would not matter in the bigger scheme of things. However, this becomes an issue when everyone thinks the same. Assuming that selection for audit is done intelligently through peer comparison of returns and data by which outliers are picked, such coordinating taxpayers might just escape the prying eyes of the taxmen. The tax administration has to ensure that the coordination between taxpayers does not happen and create a prisoner's dilemma scenario. The objective is to force the taxpayer to the orange box in the figure 6. This can be done through communication strategies as indicated in the paragraphs above. Communicating to the taxpayer that he or she is an outlier would coax him or her to comply correctly.

## 9. Policy Suggestions

Now that we understand that taxpayer's compliance behaviour can be influenced by measures as envisaged in the rational model as well as by influencing their behaviour as per the behavioural economics, we need to examine the kind of interventions that could be possible.

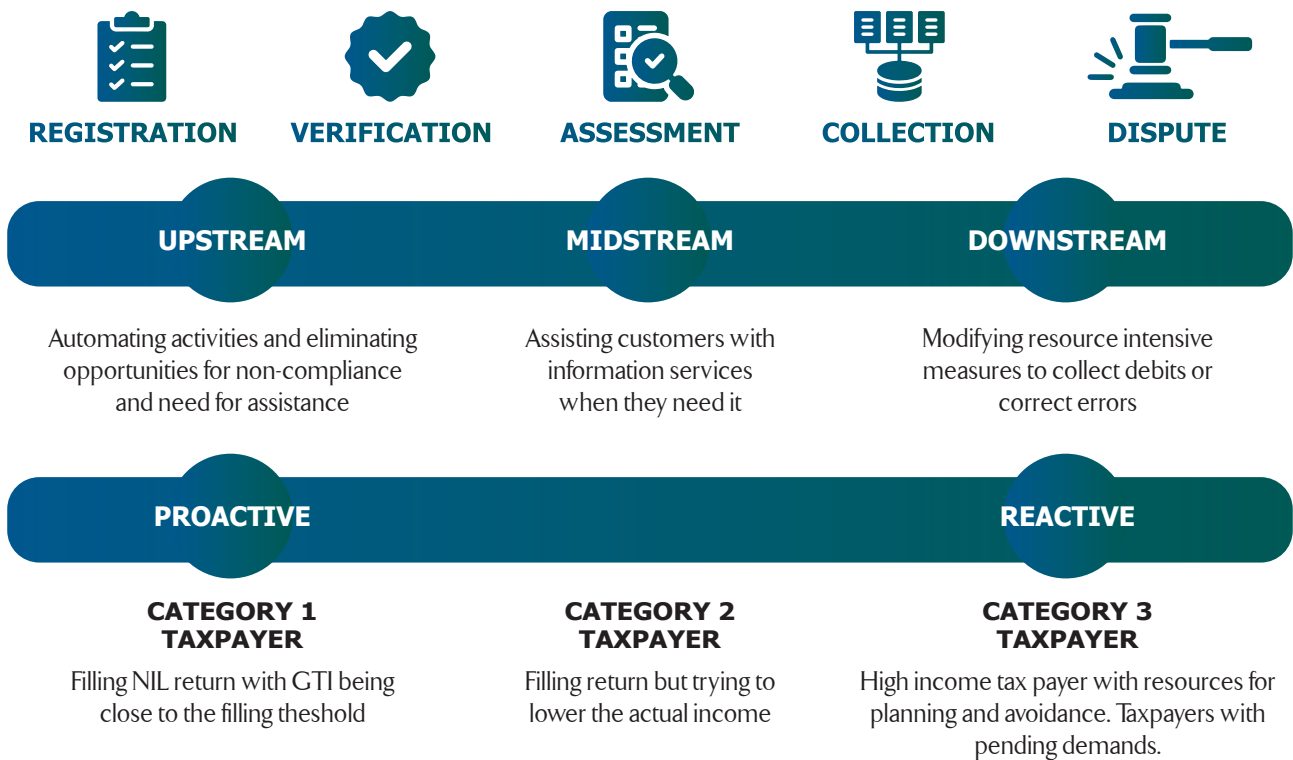
It may be seen from the administrative reforms adopted by countries like Australia that there needs to be a multipronged approach to ensure tax compliance. While behavioural insights can be used in different forms for all taxpayers, the degree of intervention would vary depending upon the level of the taxpayer (Braithwaite & Job, 2003). It may be recalled that based on the data extracted from the returns of AY 2018-19, four broad classes of taxpayers were demarcated—non-filers; those filing NIL returns by filing gross income close to the first tax slab; those below the highest slab; and those in the highest slab. The interventions can accordingly be made depending upon the category of taxpayer. With an understanding of the nature of factors that influence compliance behaviour, the interventions can be easily devised. The scope of this paper is not to prescribe a list of interventions but to highlight how our understanding of compliance behaviour has evolved. The precise interventions can be easily devised based on the principles discussed in this paper. The discussion in this paper exemplifies the complexity of human nature and behaviour and underlines the fact that a 'one size fits all' kind of compliance policy cannot be devised. Taxpayers comprise individuals of different natures, some honest and compliant, others deliberate evaders, some risk averse, and others willing risk takers. Our policy interventions to influence behaviour cannot, therefore, be strait-jacketed.

What emerges from the discussions above is that there are three main paradigms of tax compliance that have emerged—the enforcement paradigm, the service paradigm, and the trust paradigm.

The *enforcement paradigm* is the one that emerges from the rational economics-of-crime model and more applicable to the middle-high income taxpayers since the deliberate evaders and tax planners are more likely to be from this category. The enforcement activities such as audit and other intrusive activities, however, need to be of high quality which should result in the levy of additional taxes. Otherwise, such interventions may be subject to the 'Bomb Crater' effect and reduce the 'perception' of audit or its deterrence as indicated in Section 4. The use of high-quality analytics on good quality



**FIGURE 6:** The nature of intervention for the category of taxpayer



Source: Created by author

data is imperative. Audit and enforcement should be resorted to when we are reasonably sure of the outcomes. The enforcement paradigm would be applicable to taxpayers in the high-income category or mid-income category.

The *service paradigm* is applicable to taxpayers in the lower rung who are presently fence-sitters and need to be pulled into the tax bracket. These fence sitters need that little pull to get in. The main concept that would find use in this paradigm would be to use our understanding of priming, social norms and cognitive limits. Tagat (2019), in his paper has suggested how communication for social norms, public goods and cultural priming can be an effective way to reach out to taxpayers to file their returns timely and correctly. The systems should be facilitative for return filers and nudge them to also pay taxes and not be fence sitters. Pre-filing of returns and subtle pop-up communications during filing of returns could have tremendous effects.

The *trust paradigm* as discussed earlier is important for the ‘tax morale’ of taxpayers. This would be more useful for the filers who are presently filing their returns more from the attitude of ‘compulsion’ rather than ‘motivation’. Many a times, there is a fear or ‘mistrust’ that filing of higher returns might ‘highlight’ the individual before the tax authority. There is also a ‘mistrust’ that deliberate evaders are able to hoodwink the government and system, and nothing happens to them. The migration from compulsion to motivation can happen as individuals develop trust in the government and authorities.

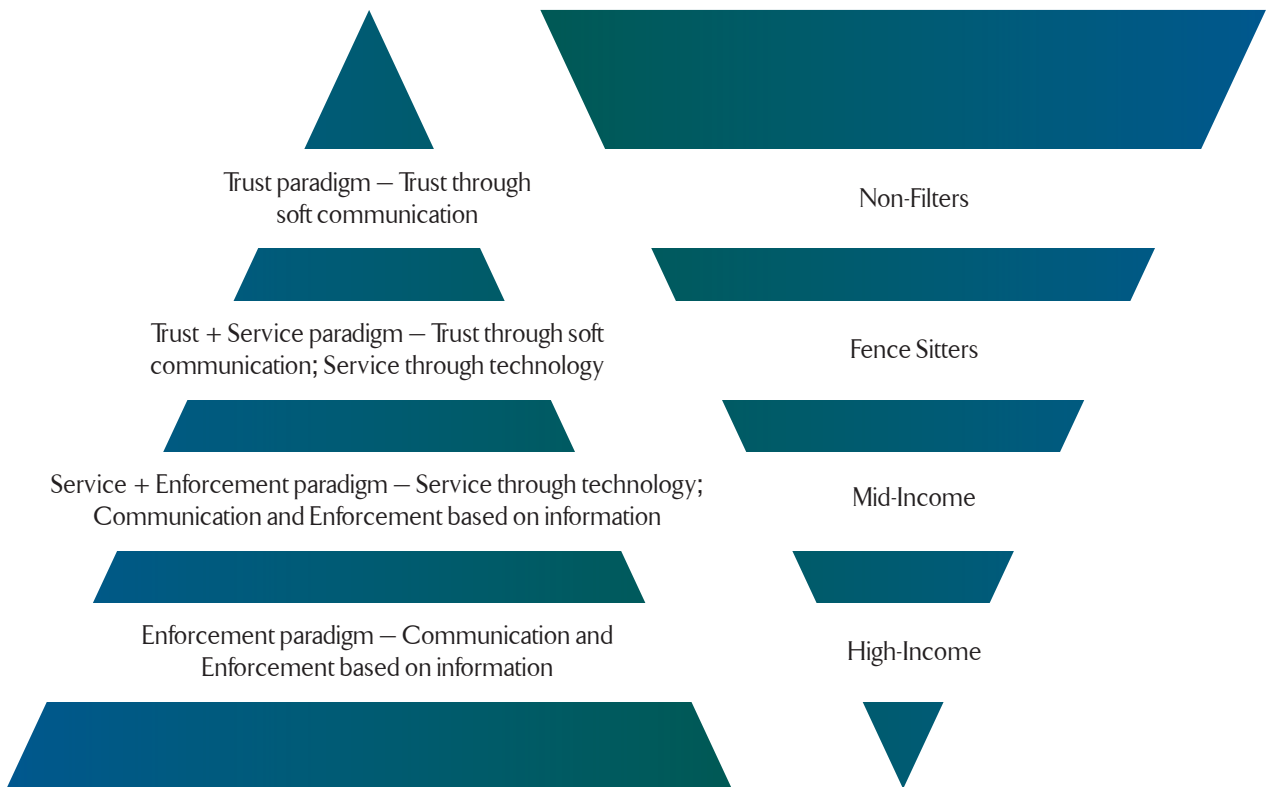
The term ‘trust’ is used in a broader connotation in this context. In this paradigm, the trust in the government is not only that the tax department would not trouble the genuine taxpayer but also that the

deliberate tax evader would be taken to task. There should, therefore, be trust that the tax administration can administer the laws correctly and accurately. Again, the use of data and modern data analytic tools is the key to ensuring an effective *Compliance Risk Management* strategy such that interventions and actions are carefully and accurately targeted.

As emphasised, data and good use of it would play the key role for the Income Tax Department. While data from numerous sources already exists, there is scope to gather data from other sources as well to get a more holistic and accurate picture of the tax and compliance profile of an individual. The effective use of data can improve—*Automation, Behavioural Intervention, Communication and, Detection*, which would comprise the ABCD of data use.

The administrative model based on these paradigms to increase compliance can be depicted through a *double-triangle* structure as depicted in Figure 7.

**FIGURE 7:** Representation of the proposed administrative model by author based on paradigms discussed in this chapter to increase compliance.



Source: Created by author

## 10. The Way Forward

As discussed earlier, understanding tax compliance behaviour is a complex and dynamic process that requires contextual analysis. The behaviour of taxpayers today is vastly different from that of a decade ago, and even within a few years, with the introduction of pre-filing, the behaviour has shifted. Therefore, there is a need for an institutional mechanism to understand these changes and develop better policies. Several countries, such as the UK, Australia, New Zealand, and the USA, have dedicated divisions that study and devise policies to influence taxpayer behaviour. While administrative data and its trends hold merit, they may not provide a complete understanding of behavioural trends or establish causality. Empirical studies using randomised trials or controlled experiments have yielded precise results and have helped in making more rational policies. Conducting such trials or pilot experiments in India's large population base would not be difficult, but it would require appropriate institutional setup to allow for flexibility and policy decision-making.

To establish an institutional structure for this endeavour, external support from experts can be useful initially, but developing in-house expertise is important to effectively identify new use cases and expand the application of behavioural insights. Academic experts in the area can provide a neutral perspective.

A dedicated Behavioural Insights Unit under the Central Board of Direct Taxes (CBDT) or Directorate of Systems of CBDT can be established to carry out research and pilot trials on various interventions, which, if found useful, can be mainstreamed. The unit may perform advisory, research, and training roles and provide advice to other areas of the organisation on how, when, and where to apply behavioural knowledge. It can also conduct independent research trials and analysis and educate others on behavioural principles while aggregating findings across organisational functions to ensure cross-organisational knowledge sharing.

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# Appendix

## APPENDIX A: Commodity wise loading details from 2012-13 to 2022-23

X-axis legend	Gross Total Income - Range (in INR)	No. of Returns
1	0	1060699
2	>0 and <=1,50,000	3278464
3	>1,50,000 and <= 2,00,000	1514259
4	>2,00,000 and <= 2,50,000	4066014
5	>2,50,000 and <= 3,50,000	14601109
6	>3,50,000 and <= 4,00,000	5114649
7	>4,00,000 and <= 4,50,000	4234753
8	>4,50,000 and <= 5,00,000	3853282
9	>5,00,000 and <= 5,50,000	3056165
10	>5,50,000 and <= 9,50,000	11385025
11	>9,50,000 and <= 10,00,000	618506
12	>10,00,000 and <=15,00,000	3107334
13	>15,00,000 and <= 20,00,000	1048557
14	>20,00,000 and <= 25,00,000	539765
15	>25,00,000 and <= 50,00,000	808991
16	>50,00,000 and <= 1,00,00,000	259026
17	>1,00,00,000 and <=5,00,00,000	137858
18	>5,00,00,000 and <=10,00,00,000	14128
19	>10,00,00,000 and <=25,00,00,000	8416
20	>25,00,00,000 and <=50,00,00,000	3032
21	>50,00,00,000 and <=100,00,00,000	1564
22	>100,00,00,000 and <=500,00,00,000	1498
23	>500,00,00,000	364
		5,87,13,458

Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

**TABLE 2:** Cumulative percentage of returned income vis-à-vis cumulative percentage of population used for plotting the Lorenz Curve

Range (in INR)	Population	Cumulative population	Cumulative population as percentage	Returned Income	Cumulative returned income	Cumulative returned income as percentage
<b>0</b>			0.0000	0		0.000
<b>&gt;0 and ≤1,50,000</b>	1327293126	1327293126	0.9618	19439	19439	0.006
<b>&gt;1,50,000 and ≤ 2,00,000</b>	1376970	1328670096	0.9628	24389	43828	0.013
<b>&gt;2,00,000 and ≤ 2,50,000</b>	3787092	1332457188	0.9655	88749	132577	0.039
<b>&gt;2,50,000 and ≤ 3,50,000</b>	14275685	1346732873	0.9759	435583	568160	0.166
<b>&gt;3,50,000 and ≤ 4,00,000</b>	5025936	1351758809	0.9795	187421	755581	0.221
<b>&gt;4,00,000 and ≤ 4,50,000</b>	4156142	1355914951	0.9825	176437	932018	0.273
<b>&gt;4,50,000 and ≤ 5,00,000</b>	3783374	1359698325	0.9853	179602	1111620	0.326
<b>&gt;5,00,000 and ≤ 5,50,000</b>	2999708	1362698033	0.9875	156922	1268542	0.371
<b>&gt;5,50,000 and ≤ 9,50,000</b>	11153567	1373851600	0.9955	786895	2055437	0.602
<b>&gt;9,50,000 and ≤ 10,00,000</b>	600970	1374452570	0.9960	58565	2114002	0.619
<b>&gt;10,00,000 and ≤15,00,000</b>	3001781	1377454351	0.9982	358928	2472930	0.724
<b>&gt;15,00,000 and ≤ 20,00,000</b>	998299	1378452650	0.9989	171450	2644380	0.774
<b>&gt;20,00,000 and ≤ 25,00,000</b>	508642	1378961292	0.9992	113143	2757523	0.807



>25,00,000 and <= 50,00,000	736059	1379697351	0.9998	247793	3005316	0.880
>50,00,000 and <= 1,00,00,000	209345	1379906696	0.9999	141704	3147020	0.922
>1,00,00,000 and <=5,00,00,000	89793	1379996489	1.0000	161142	3308162	0.969
>5,00,00,000 and <=10,00,00,000	5132	1380001621	1.0000	34814	3342976	0.979
>10,00,00,000 and <=25,00,00,000	2089	1380003710	1.0000	31046	3374022	0.988
>25,00,00,000 and <=50,00,00,000	451	1380004161	1.0000	15474	3389496	0.993
>50,00,00,000 and <=100,00,00,000	147	1380004308	1.0000	9929	3399425	0.995
>100,00,00,000 and <=500,00,00,000	74	1380004382	1.0000	13130	3412555	0.999
>500,00,00,000	3	1380004385	1	2344	3414899	1.000
<b>Total</b>	1380004385					

Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

**TABLE 3:** State wise comparison of GDP and Direct Tax data

State	Income-tax Region	Corporate Tax	Income Tax	Total	Region wise direct tax (in lacs)	Total Direct tax (in lacs)	GDP (in lacs)
MAHARASHTRA	MUMBAI	199833	134530	346863	34686300	41431900	281855457
	PUNE	25579	35419	60998	6099800		
	NAGPUR	1503	4955	6458	645800		
DELHI	DELHI	72295	68787	141082	14108200	14108200	83087249
KARNATAKA & GOA	KARNATAKA & GOA	65804	76106	141910	14191000	14191000	170375630
TN & PUDUCHERRY	TN & PUDUCHERRY	33948	38383	72331	7233100	7233100	183523241
AP & TELANGANA	AP & TELANGANA	29894	37160	67054	6705400	6705400	192843132
GUJARAT	GUJARAT	25606	29880	55486	5548600	5548600	163024012

J&K, PUNJAB, HARYANA, HIMACHAL PRADESH	NWR	18579	26153	44732	4473200	4473200	165349694
WB & SIKKIM	WB & SIKKIM	25312	21478	46790	4679000	4679000	123863160
UP & UTTARA- KHAND	UP (WEST)	8914	12129	21043	2104300	3433700	194148424
	UP (EAST)	2410	10884	13294	1329400		0
MP & CH- HATISGARH	MP & CH- HATISGARH	8917	12367	21284	2128400	2128400	128236053
RAJASTHAN	RAJASTHAN	9793	10669	20462	2046200	2046200	99899911
KERALA	KERALA	7053	9584	16637	1663700	1663700	85468899
BIHAR & JHARKHAND	BIHAR & JHARKHAND	3433	9238	12671	1267100	1267100	91517371
ODISHA	ODISHA	6791	5447	12238	1223800	1223800	54795908
ASSAM, ME- GHALAYA, NAGALAND, MANIPUR, MIZORAM, TRIPURA, ARUNACHAL PRADESH	NER	1336	5331	6667	666700	666700	54033168

Note: Figure created by author using data from Income Tax Department (2019). Source: Income Tax Department, Government of India. (2019). Income tax return statistics: Assessment year 2018-19. Central Board of Direct Taxes. Retrieved from <https://incometaxindia.gov.in/Pages/Direct-Taxes-Data.aspx>

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