On The Manu-Kautilya Norms Of Taxation: An Interpretation Using Laffer Curve Analytics

D. K. Srivastava*

Abstract

High tax-rates erode their own bases, and thereby adversely affect tax-revenues. This general idea, which is referred to as the Laffer Curve, can be traced back to Kautilya's famous treatise on Economics, *Arthasastra*, and even before that, to the ancient Indian book of laws called the *Manusmriti*. This paper considers the basic tenets of taxation prescribed in these texts and attempts to interpret the tax-rates proposed for different economic activities using Laffer Curve analytics. In particular, an attempt is made to interpret the core rate of taxation proposed in these works, *viz.*, one-sixth of the tax-base. The implicit assumption in prescribing moderate tax-rates appears to indicate the value judgement that in most economic activities, the negative substitution effect of increasing taxation overpowers the positive income effect, if any, at rather low tax-rates.

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* The author is Professor at the National Institute of Public Finance and Policy, New Delhi.

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I. INTRODUCTION

The capacity of high tax-rates to erode their own tax-bases, leading to a parabolic relationship between tax-rates and tax-revenues, has often been discussed in recent times in terms of the Laffer Curve. The realization that an inverse relationship may exist between tax-rates and tax-bases, and consequently between tax-rates and tax-revenues, beyond some critical levels of tax-rates, is not entirely new. Specific passages in Adam Smith [1776] and Dupuit [1844] cited, for example, in Fullerton [1982] indicate precisely these ideas. The fourteenth century Arabic philosopher Ibn Khaldun, translated by Rosenthal [1967] and quoted extensively in Lipsey [1989] had discussed these ideas at length. Much earlier to these sources, explicit references to the ideas now summarily referred to under the rubric of the Laffer Curve are, in fact, obtained in Kautilya's famous treatise on Economics, entitled *Arthasastra*[1] (3rd Century B.C.) and even before that, in the ancient Indian book of laws called the *Manusmriti*.[2] Both works, keeping in perspective the base-eroding capacity of high rates of taxes, emphatically stress moderate taxation. They had prescribed, in great detail, relevant rates of taxes for specified economic activities. These tax-rates, which are written as proportions or percentages, are specific numbers. Although one comes across an array of tax-rates, there are only a few core tax-rates. Among these, the tax-rate of one-sixth (16.667 per cent) is the key tax-rate applicable to domestic trade and economic activities. While discussing the basic tenets of taxation prescribed in the Manu-Kautilya treatises, it has been argued in this paper that it is possible to provide a specific interpretation to the core tax-rate determined by them, which may be referred to as the Manu-Kautilya rate of taxation, by using analytical tools appropriate for Laffer Curve analytics.

The outline of this paper is as follows. Section II discusses the ideas pertaining to taxation in *Arthasastra* as well as *Manusmriti* by referring to the relevant slokas and *Sutras* in the text. Section III identifies the tax-rates prescribed for different categories of tax-bases in the two works. A methodology for a general specification of the Laffer Curve that may more generally be called a rate-Revenue **(rR)** function is proposed in Section IV. Using this methodology, an attempt is made to interpret the core Manu-Kautilya tax-rate in Section V. The most attractive interpretation identifies it as a point of inflexion on the Laffer Curve. There is a kind of universality in the proposed number which transcends both time and space. Section VI concludes the paper.

II. *MANUSMRITI* AND *ARTHASASTRA*: TAXATION PRINCIPLES

Although, the date of *Manusmriti* has been a subject of considerable debate, it is generally recognised to be one of the most ancient texts on the principles of governance in India. Kautilya himself acknowledges having drawn from it extensively. The overall principles of taxation in *Manusmriti* are given in Chapter 7. Taxation should enable the king to perform his functions, and should enable the traders and economic agents to produce and retain adequate fruits of their trades. The basic principle of taxation is most summarily stated in the second line of *Sloka* 127 which says: "Considering the protection of that which is already there, and that which is to be increased, the King should levy tax on his traders" [7.127]. Thus, the protection of the tax-base (or productive-base) and its augmentation become the first principles of taxation. In the next *Sloka*, this is expanded upon.

> "That which would enable the King to perform his functions of looking after (the welfare of people) and traders to remain with the fruits of their trades (both should get adequate rewards according to their industry); this, having been well-considered, the King should levy a tax" [7.128].

Earlier, in *Sloka* 80 of the same Chapter [7], it has been said that the tax should be annual, and that it should be collected by reliable functionaries. In collecting the tax, the King should be fair between his subjects, as fair as a father, between his sons.

The King should never overtax. Taxation should never be detrimental to the spontaneous growth of the tax base. Metaphors of a leech, bee and calf are used to bring this point home.

> "Just like a leech, calf and bee draw only small-but-very-small quantities from their respective feeds (i.e., blood, milk and honey), similarly a King should, by his orders, take from his subjects, very small amounts of taxes" [7.129].

In the examples of leech, calf and bee, the amount drawn is always too small to be detrimental to the growth of the base. Similarly, taxation should be moderate enough to be conducive to the growth of the tax-base. Further on, in the same chapter, in *Sloka* 139, a warning is issued against excessive `tax-greed' that will destroy the productive base of the system.

> "The King should not destroy his own roots, and the roots of his subjects by excessive greed, because the King, destroying his own roots, and the roots of his subjects, makes himself and his people suffer" [7.139].

The imagery of a tree is picked up by Kautilya in *Arthashastra* who likens taxation to the picking up of just ripening fruits. In the Chapter on "Replenishment of Treasury", Kautilya in his *Arthasastra* lays down the guiding principle of taxation and warns against destroying the tax-base. Taxation should not inhibit the spontaneous growth of the productive base of the economy. It is from the ripe fruits that seeds for a new crop of trees would emanate. The following *Sloka* [Book 5, Chapter 2, *Sloka* 70] aptly summarises his instruction to the king:

> "He (the King) should take from the kingdom, fruits as they ripen, as from a garden, avoiding taking unripe fruits, for that will be self-destructive, and cause an uprising against him" [5.2.70].

III. *MANUSMRITI* AND *ARTHASASTRA*: PRESCRIBED TAX-RATES

Keeping these general principles in mind, Manu and Kautilya subsequently proposed specific rates of taxation for specific tax-bases. The core tax-rates are common in both the texts, and can therefore be referred to as the Manu-Kautilya rates of taxation. Both *ad-valorem* and specific tax-rates have been prescribed in *Manusmriti* and Kautilya's *Arthasastra*.

The rates are usually in terms of proportions (percentages). Important *Slokas* wherein Manu has indicated the tax-rates, that are often different for different categories of tax-bases, and also contain some elements of progressivity, are given below. Chapter 7 of the *Smriti*, in *Slokas* 130, 131 and 132, contain the prescribed tax-rates.

> "The tax of the King for animals and gold (in excess of the initial amount) shall be 1/50th part, and for grains it will be 1/6th, 1/8th or 1/12th part (the latter ones for less fertile lands)" [7.130].

Here, the general rate prescribed for agricultural produce is 1/6th. Lower rates (1/8th and 1/12th) are for less fertile land. The same rate has been specified for a host of other goods. Thus,

> "On trees, meat, honey, ghee (buttermilk), gandha (perfumes), medicines, juices (and salt, etc.), flowers, leaves, green leaves (shaka), grass, leather, bamboo, earthen pots, and articles made of stone (the King) should take 1/6th as the tax".

In *Slokas* 137 and 138, several categories of people are indicated, where concessional rates are to be applied or exemptions are to be given. It is clear that with some exceptions (1/8th or 1/12th for less fertile lands, and 1/50th for animals and gold), the general rate of taxation prescribed by Manu is 1/6th of the tax-base.

The entitlement to the King of one-sixth share of the activities of his subjects, appears to have a `divine' sanction in *Manusmriti*. It transcends mere taxation of economic activities, and characterises even the sharing of the fruits of `*dharma*' and `*adharma*' of his subjects, i.e., the (intangible) fruits of the good and prescribed deeds, as also the fruits (punishments) of bad and proscribed deeds of his subjects. Thus,

> "The King who protects his subjects, obtains one-sixth of the reward of the good deeds *(dharma)* of his subjects, the King who does not protect his subjects gets one-sixth of the fruits of bad

deeds *(adharma)* of his subjects" [8.304].

And "From among the subjects residing in his kingdom, the King who protects his subjects well, obtains one-sixth of the fruits of good deeds performed by his subjects, like the reading of *Vedas*, performing of *Yajnas*, giving of donations and worship of devas" [8.305].

In the Kautilya *Arthasastra*, the general principles of taxation and the rates of taxation are given in Part 2 Chapter 22 and additional principles for the `replenishment of treasury' (in times of emergency, war, etc., which may have caused an excessive outflow from the treasury) are given in Part 5 Chapter 2.

In Part 2, Chapter 22, *Sutras* 3-8 prescribe these tax-rates. *Sutra* 3 states: "On goods coming in (the duty shall be) one-fifth of the price" [2.22.3].

This is the highest duty prescribed in the *Arthasastra* and applies to `imports' from outside the kingdom. It is an *ad-valorem* duty. For goods produced within the kingdom, a slight edge is provided with lower rates. Thus, *Sutra* 4, gives the rate as 1/6th. It states:

"Of flowers, fruits, vegetables, roots, bulbous roots, fruits of creepers, seeds, dried fish and meat, he should take one-sixth part (as duty)" [2.22.4]. Lower rates are prescribed for the tax-bases indicated in the *Sutras* 6 and 7.

"On ksauma, dukula, silk yarn, armours, yellow orpiment, red arsenic, antimony, vermilion, metals of various kinds and ores, on sandalwood, aloe, spices, fermentation, and minor substances, on skins, ivory, bed spreads, coverings and silk cloth, and on products of goats and rams (the duty to be charged is) one-tenth part or one-fifteenth part*" [2.22.6].
"On clothes, four-footed and two-footed creatures, yarn, cotton, perfumes, medicines, woods, bamboos, banks, leather goods and earthen-ware, and on grains, fats, sugars, salts, wine, cooked food and so on (the duty is) one-twentieth part or one-twenty-fifth part"

[2.22.7].

In the *Arthasastra*, thus, the following rates have been proposed: 1/5th for imports, and 1/6th for domestic production, with the lower rates of 1/10th, 1/15th, 1/20th and 1/25th for specified categories of goods. In Book 1, Chapter 13 of *Arthasastra*, there is a reference to 1/6th as being a general rate. It is said "Therefore, even forest-dwellers offer a sixth part of their gleaned grains (saying, `This is the share for him who protects us')" [1.13.9].

In *Manusmriti*, quite clearly, the preferred rate of tax is 1/6th. This is also the core rate of taxation in Kautilya's *Arthasastra*. But imports have to pay a rate higher than this, and for certain preferred categories of goods, the tax-bases of which are to be encouraged, lower rates are prescribed. There is some provision for variation within the same category, e.g., those covered in *Sutras* 6 and 7.

It is contended in this paper that the numbers proposed in the Manu-Kautilya treatises are not arbitrary. They have a special significance in the context of the relationship between tax-rates, tax-bases, and tax-revenues. An interpretation can be given to these numbers using modern day Laffer Curve analytics. This exercise is undertaken in the ensuing section. In particular, we shall concentrate on the core rate of taxation, *viz.*, 1/6th, which we shall refer to as the Manu-Kautilya tax-rate.

IV. SOME ANALYTICS OF RATE-REVENUE FUNCTIONS

The relationship between tax-rates, and the tax-revenues that they generate over the entire range from zero to hundred per cent, can be summarised in terms of rate-Revenue **(rR)** functions. An example of such a relationship in the context of an income or wage tax is the Laffer Curve which describes a parabolic relationship between tax-rates and tax-revenues. In principle, it is possible to visualise the existence of a rate-Revenue function for each tax, whether direct or indirect, although various alternative shapes of the function may be derived for different taxes.

The rate-Revenue relationship is mediated by a rate-base (RB) relationship.

Assuming that a single rate (r) pertains to a tax-base (B), revenue from the concerned tax may be written as

$$R = rB \tag{1}$$

The tax-base, may be considered to be a function of a number of variables (X_j) including the tax-rate itself. All the other variables are assumed to be independent of r and R, and their values are taken to be given. Thus,

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The rate-revenue function would thus describe how revenues would change as the concerned tax-rate changes from zero to its maximum possible value, treating other determinants of the tax-base as exogenous. Should any of these change, the entire rate-Revenue function would need to be shifted appropriately.

The rate-base function may be described by a general polynomial in the tax-rate (r). Thus,

$$B = \alpha_o + \alpha_1 r + \alpha_2 r^2 + ... + \alpha_n r^n \tag{3}$$

The influence of the exogenous variables, being held constant, is summarised in the constant term. Without loss of generality, the terms used in (3) can be normalised with respect to α_o. Defining,

$$Y = B/\alpha_o \text{ and } \beta_i = \alpha_i/\alpha_o \qquad (i = 1, ..., n)$$

(3) can be rewritten as

$$Y = 1 + \beta_1 r + ... + \beta_n r^n \tag{4}$$

This procedure enables one to use the output (tax-base) which would obtain when the tax-rate is zero as a unit of measurement. Thus, in (4), when r = 0, Y = 1. Any change in Y, is now brought about solely through changes in the tax-rates. Thus, for any given r, if Y = 1.5, it would mean, that the tax-base is 1.5 times what it would be in the absence of taxation, given a set of exogenous variables. Assuming that the tax-rate can vary in the range of (0, 1), we may specify the rate-base relationship in a general way by using the following version of Rolle's theorem:

> "Let Y = f(r) be a continuous function in the closed interval [0, 1] and differentiable in the open interval (0, 1), such that there exists a tax-rate r_o in the interior of (0, 1) at which Y(0) = Y (r_o) and Y(1) = 0".

This theorem is required to ensure that the tax-base does not continuously decline as the tax-rate increases. Rather, at first the tax-base increases as the tax-rate increases, reaches a peak and then continuously declines, becoming zero, at hundred per cent rate of taxation. Because of the existence of a peak, there must exist a tax-rate at which Y would become equal to its value at r = 0, i.e., the revenue initiating point, as depicted in Figure 1.

There are sound economic reasons why for direct as well as indirect taxes, the tax-base may at first increase as the tax-rate increases, and subsequently decline, continuously.

In the construction of a Laffer Curve for an income tax, it has been recognised that the imposition of a tax on income has both a substitution effect and an income effect. The imposition of a tax on income induces people to substitute leisure for labour, thereby having a negative impact on income. On the other hand, over some range, people are

FIGURE 1

induced to work harder in order to maintain their post-tax income, thereby generating an income effect. Beyond a certain range, the substitution effect dominates the income effect, leading to a continuous decline in the tax-base. But as long as the income effect is larger than the substitution effect, which is expected over low rates of taxation, the tax-base function may rise.

In the case of *ad-valorem* commodity taxes also, the increase in tax-rates, in general, increases prices and reduces quantities. It can be shown[3] that under certain conditions the price effect on the tax-base is larger than the quantity effect, and the tax-base increases with the tax-rates. In particular, as long as the proportionate change in price ($\Delta P/P$) following a change in the tax rate is larger than the proportionate change in quantity ($\Delta q/q$), the tax-base of an *ad-valorem* commodity tax will increase as the tax-rate increases.

Other reasons can also be cited in support of a parabolic rate-base relationship. For example, government expenditure, financed out of taxation, makes a net contribution to the tax-base which outweighs the negative impact of taxation when the government is not suboptimally large. Initially, as the government grows, creation of infrastructure, economies of scale in technological development, and setting up of governmental institutions provide an enabling atmosphere for private enterprises to flourish. The government may also attract foreign capital and technology through providing a climate of security and fulfilment of contractual obligations. However, as taxation increases, the government may become oversized and less efficient. An overgoverned economy may drive labour and capital out of the domestic economy, thereby having a detrimental effect on the growth of the productive base.

A quadratic function in r is necessary and sufficient to ensure a single peak for the tax-base function in the range of $r = (0, 1)$. A special form for equation (4) may be defined as

$$Y = 1 + \beta r - (1 + \beta)\, r^2, \quad \beta \geq 0 \tag{5}$$

This function has a value $Y = 0$, at $r = 1$. In Figure 1, the above rate-base relationship is represented for some alternative values of β. As β increases, the curve gains more height and its peak shifts to the right. To identify the maximum, we have

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from which

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The revenue function corresponding to the base function given by (5) may be written as

$$R = r + \beta r^2 - (1 + \beta)\, r^3 \tag{7}$$

This specification ensures that tax-revenues are zero when the tax-rate, $r = 0$. Further, $R = 0$, also when $r = 1$, i.e., when hundred per cent of the tax-base is taxed. At this rate, the base becomes zero.

From this,

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This function may be interpreted as the marginal revenue function. $R^{\prime}$ itself has a maximum, when

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Beyond, r*, the marginal rate of Revenue, begins to decline. This means that beyond r*, tax-revenue increases at a decreasing rate.

It can be ascertained that tax-revenue itself has a maximum at

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It is with the positive root in the above expression that the second order condition for a maximum is satisfied.

Since the tax-base (Y), total tax-revenue (R) and marginal tax-revenue Install Equation Editor and double-click here to view equation., are all functions of the tax-rate, they can be drawn in a vertical sequence, as shown in Figure 2. In this figure, the tax-rates r*, $r(R_{max})$ and $r(Y_{max})$ have been indicated respectively as $r_{R|}$, r_R and r_Y. The aggregate revenue function (Figure 2a) can be divided into three distinct ranges. In part I, aggregate revenue increases at an increasing rate as the tax-rate increases. In part II, aggregate revenue increases at a decreasing rate. Part III provides the inefficient part of the revenue function where tax-revenues decline as tax-rates continue to increase.

V. AN INTERPRETATION OF THE CORE MANU-KAUTILYA RATE

The core Manu-Kautilya rate is 1/6th of the value of the tax-base (income or value of commodity), i.e., 16.667 per cent. Lower and higher rates are prescribed in exceptional cases.

In the aggregate revenue function, a point of inflexion occurs at

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At this point the marginal revenue curve (R^{-}) also reaches a maximum. Beyond this point revenues continue to grow but at a decreasing rate.

For a benchmark value of $\beta = 1$,

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Although other interpretations of this rate are possible, it is attractive to interpret the Manu-Kautilya rate of taxation as the point of inflexion on the rate-revenue (rR) function. An alternative is to interpret this rate as a base maximising rate. For a value of $\beta=0.5$, $r(Y_{max})=\beta/[2(1+\beta)]=1/6$. In other words, for all commodities or tax-bases where β lies between 0.5 and 1, the tax-rate of 1/6 will lie between the point where the marginal revenue curve has a maximum and the point where the tax-base would be a maximum. The judgement that is involved in the prescription of the Manu-Kautilya tax-rate for a given tax-base are thus the following:

i. that for most commodities (or tax-bases), the value of β is likely to be low; and

ii. that it is useful to remain in the range where, at one extreme, marginal tax-revenue starts falling and, at the other, where the tax-base stops increasing.

Figure

Manu-Kautilya have argued for a low-rate of taxation, which is far below the revenue maximising tax-rate, synonymous with the "greed" of the taxing authority. Further, the tax-rate should be low enough to lead to a growth in the tax-base. Thus, the relevant tax-rate should not go beyond the base-maximising rate and should be less than the revenue-maximising tax-rate. It can be established that the point of inflexion is to the left of both the base - and revenue maximising tax-rates. In fact,

$$r(R_{max}) > r(Y_{max}) > r^*$$

Comparing the first two, we have,

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if Install Equation Editor and double-click here to view equation.

or if $(\beta + 2)^2 \quad > 0$

which is true.

Further, $r(Y_{max}) > r^*$

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which is also true.

An interpretation needs to be given also to the benchmark value of $\beta = 1$. The tax-base function in this case is

$$Y = 1 + r - 2r^2.$$

This is a highly symmetric function where at 50 per cent rate of taxation, the tax-base falls back to the initial level achievable in the pre-tax situation. The base is maximised at $r = 0.25$. Beyond this point, the tax-base starts falling, reaching the revenue initiation level ($r = 0$) at $r = 0.5$. Thus, with $\beta = 1$, a typical tax-base function is obtained, divided into three distinct parts over the ranges of r from 0 to 0.25, 0.25 to 0.5, and 0.5 to 1.

It may be noted that the tax-rate of one-sixth is derived in a manner such that it is independent of the specific circumstances of a country and time which are captured in the constant term (`$\alpha$' in equation 3, which refers to what the output would be when no tax is levied). All production and technological conditions are captured within this term. The only parameter on which the tax-rate depends is `β', which relates to the responsiveness of the tax-base to tax-rate changes.[4] Given a benchmark value of β, the general rate of tax is prescribed.

VI. CONCLUDING OBSERVATIONS

While moderate taxation is not detrimental to the growth of the tax-base and may, in fact, augment it, excessively high tax-rates are self-debilitating. They lead to a depletion of the tax-base as well as tax-revenues. These ideas form the basis of the Laffer Curve. In this paper, an attempt is made to trace back these ideas to the ancient Indian texts dated as far back as 1000 B.C. to 300 B.C. It is contended that not only the general principles of taxation enunciated by Manu and Kautilya have relevance even today, the specific tax-rates which they prescribed, especially for domestic economic activities, can be interpreted in terms of modern Laffer Curve analytics.

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Notes

1. An excellent English translation of *Arthasastra* is available in Kangle [1963, 1972] apart from several other translations.

2. Most *Smriti* literature is considered to have been written during the period from 1000 B.C. to 400 B.C. *Manusmriti* is acknowledged to be the oldest of them and most authentic. Subsequent *Smritis* derive extensively from the *Manusmriti*.

3. Consider the supply-demand model:

$$q^d = A - Bp$$

$$q^s = -a + bp(1 - r)$$

where r is the tax-rate and p is the tax inclusive price paid by the buyer. The quantity traded and equilibrium price are given by:

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The tax-base is given by

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Also,

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It can be ascertained that

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if $Ab(1 - r) > B(A + 2a)$

or if Install Equation Editor and double-click here to view equation.

Thus, the tax-base would increase from 0 to r** as the tax-rate increases, provided r** > 0.

4. It may be noted that as β increases, the rate at which tax-base is maximised, shifts to the right. When $\beta = 0$, $r(Y_{max}) = 0$. As $\beta \sim \infty$, $r(Y_{max}) = ½$. As such parameter β captures the relative strength of the income effect *vis-a-vis* the substitution effect generated by increase in tax-rates. The higher is the value of β, the larger is the income effect. Beyond the base-maximising tax-rate, the base-eroding capacity of increasing tax-rates becomes overpowering. In concentrating on low values of β in the range (½ to 1), the implicit assumption appears to be that in most economic activities, the negative substitution effect of increasing taxation sets in quite early.

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