# A Transitional Gains Trap: Prison Sentences and Prison Capacity*

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Clark and Lee (1996) offer a very creative explanation for the widespread problem of prison overcrowding. The methodological paradigm of that paper is the Laffer curve. In its original guise the Laffer curve served as a justification for lowering tax rates in order to increase tax revenue. The public choice theorists extended the Laffer paradigm to explain short-run decisions, higher tax rates, that lead to long-run consequences, lower tax revenue, from which it is difficult to escape.

The classic supply and demand model of crime (Becker, 1968) provides a mechanism for the determination of the optimal probability of conviction and size of penalty. Once the probability of conviction and size of penalty are determined, it is possible to compute the required prison space. The deviation of practice from theory, sentences that are too short and crowded prisons, has awaited a consistent theory of political behavior. The paper by Clark and Lee builds that bridge. In using the Laffer paradigm to analyze prison sentencing and construction, one arrives at the inevitable conclusion that society cannot escape from sentences which are too short and prisons which are overcrowded.

An erstwhile neoclassical economist might assert that Becker's original theoretical model was incorrectly specified. That is, the original analysis should be modified to reflect the additional social costs which prevent politicians from constructing the optimal amount of prison capacity. In part this was done by Becker by alleging that the social cost of the penalty was some multiple of the private cost of the penalty. However, he omitted the behavioral detail necessary for the assessment of this social cost wedge and its persistence.

## Is There a Transitional Gains Trap?

Before accepting the Laffer paradigm, one should ask whether we are really in a transitional gains trap, or whether the sentencing and

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prison space adjustment process is merely sluggish. Implicit in the Laffer curve model is a mapping from the probability of incarceration, the length of sentence, and the number of offenses to the needed prison space. Since the planning and construction of prison space is itself a time-consuming process in the production of less offenses, one can expect the market for prison space to be in disequilibrium. A model of sluggish input adjustment along the lines of Nadiri and Rosen (1969) might produce data consistent with the phenomenon of shorter sentences and prison overcrowding.

There might also be a constitutional reason for the data which produce an apparent transitional gains trap. From the locational perspective, it is not the size of the prison population per se that is the problem. Rather, it is the cost of incarceration, the prison occupancy rate, and the immobility of prisoners between jurisdictions that create the problem. Although there may be an apparent transitional gains trap in, say Philadelphia, the problem could be overcome by shipping their surfeit of prisoners to a jurisdiction which has excess prison capacity. Politicians must then choose between building more prisons and overcoming the civil rights objections to relocating prisoners.

In a similar vein, the transitional gains trap is exacerbated by the nature of public sector accounting. Most accounting in the public sector is done on an accrual basis, much the way one keeps one's checkbook. There is no capital account for funding depreciating assets comparable to that maintained in private industry. When a government agency builds a prison, the bill is due and payable in the period of completion. By contracting with a private prison operator, the government could avoid this problem. The capital cost of the prison is built into the annual contract agreement and is spread over the life of the prison.

Sentences may be falling as "compensation" for improved police technology and practice which raise the probability of incarceration. At the same time one may interpret the quality of life in prison, as measured by overcrowding, as one aspect of deterrence and prevention. If this is the case, then deliberate overcrowding might be confused, observationally, with a transitional gains trap.

## The Inevitability of a Sentencing–Space Problem

The conclusion that society will find itself in a transitional gains trap depends critically on the shapes and locations of several curves describing behavioral relations. The behavioral relations describe the long-run and short-run penalty–prison space technical relationship (the sentencing Laffer curves) and society's penalty–prison space preferences.

Although the graphs of behavioral relations, Figures 1 and 3 in their

essay, are turned on their side, the authors present an argument that the three relations are concave over the relevant domain, sentence length. Furthermore, the maximum for the long-run Laffer curve occurs at a sentence length below the sentence for which a given social indifference curve reaches a maximum. That is, $L^* > L_M$ in their Figure 1. Even with this ordering there is no guarantee that political myopia will result in sentences of shorter and shorter duration.

If one accepts the marginal rates of substitution implied by the sentencing Laffer analysis, there remains the possibility that the sentence lengths corresponding to the maxima of the social indifference curves lie below $L_M$. In fact, a compelling case can be constructed for this outcome.

Begin by formulating a social loss from offenses minimization problem[1] given by

$$\Psi = D(O) + C(p, O) + sS(O, L, p)$$
$$O = O(p, L) \tag{1}$$

where $O$ is the number of offenses, $p$ is the probability that an offender will go to jail, $L$ is the sentence imposed, and $s$ is the unit cost of prison space. $D(O)$ is the net harm of an offense, i.e., the harm inflicted upon the victim less the gains accruing to the perpetrator, $C(p, O)$ is the cost of enforcing the law exclusive of the costs of incarceration, and $S(O, L, p)$ is the mapping from offenses, sentence length, and probability of incarceration to needed prison space.

The first-order conditions can be rearranged as

$$D' + C' = -\frac{s}{O_L}\left(\frac{\partial S}{\partial L} + \frac{\partial S}{\partial O}\frac{\partial O}{\partial L}\right)$$
$$D' + C' + C_p\frac{1}{O_p} = -\frac{s}{O_p}\left(\frac{\partial S}{\partial p} + \frac{\partial S}{\partial O}\frac{\partial O}{\partial p}\right) \tag{2}$$

where a subscript denotes a partial derivative with respect to that variable. The left-hand side of each equation is the marginal benefit from a reduction in offenses produced by a change in sentence length or probability of incarceration, respectively. The right-hand side is the marginal cost of reducing offenses by changing sentence length or probability, respectively.

Since $C_p(1/O_p) < 0$ in the first-order conditions, we can state the following inequality.

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[1] This is a slight generalization of the Becker model. The generalization is in the prison space term.

$$1 < \frac{\dfrac{1}{O_L}\left(\dfrac{\partial S}{\partial L} + \dfrac{\partial S}{\partial O}\dfrac{\partial O}{\partial L}\right)}{\dfrac{1}{O_p}\left(\dfrac{\partial S}{\partial p} + \dfrac{\partial S}{\partial O}\dfrac{\partial O}{\partial p}\right)} \tag{3}$$

Assuming risk aversion[2] is equivalent to $0 > O_p > O_f$, the inequality in (3) can be rewritten as

$$\frac{\partial S}{\partial p} - \frac{\partial S}{\partial L} < \frac{\partial S}{\partial O}\left(\frac{\partial O}{\partial L} - \frac{\partial O}{\partial p}\right)$$

The signs and magnitudes of the partials allow us to state that the right-hand side of the inequality is less than zero. Therefore, since Clark and Lee argue that $\partial S/\partial L < 0$, it is possible to conclude that $\partial S/\partial p < \partial S/\partial L < 0$. This seems to be illogical. It is hard to imagine that, *ceteris paribus*, an increase in the probability of incarceration would require less prison space. Empirical evidence to the contrary, it would appear that the Clark and Lee model depends on criminals for whom crime does pay, i.e., risk preferrers. Since the criminal world is composed of risk-averse individuals, the social optimum must occur for sentence lengths below $L_M$.

The short-run dynamics of Clark and Lee can now be combined with the lower social optimum to explain rising sentence lengths since the early seventies. The short-run Laffer sentencing curve cuts the long-run curve from below for sentence lengths above $L_M$. Some extrapolations of the Clark and Lee figures show the short-run Laffer sentencing curve emanating from the origin. This cannot be the case. In the short run there is a stock of incarcerated prisoners serving time, even if new miscreants are given zero sentences. Therefore, the short-run Laffer curve begins at a place on the prison space axis corresponding to the amount of space needed to accommodate prisoners currently serving time. The short-run curve is less steep than the long-run curve and hence cuts it from above for sentence lengths below $L_M$ and from below for sentence lengths above $L_M$. A short-run curve passes through the long-run curve at the point where it is tangent to the social indifference curve, below $L_M$. This point is not sustainable since the short-run curve and the indifference curve are not tangent. The political process will result in longer sentences, using the reasoning in the Clark and Lee exposition. Society will find itself with a shortage of prison space. Rising to the requisite prison space on the rising portion of the long-run Laffer curve will result in a new unsustainable short-run equilibrium. The process continues as Clark and Lee describe it until a

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[2] There is empirical evidence for both individuals and the aggregate to support this position. See Buck et al. (1989) and Ehrlich (1973), respectively.

point is reached where a tangency between the social indifference curve and the short-run Laffer curve occurs at some point on the rising portion of the long-run sentencing curve. The conclusion is that the transitional gains process will guarantee that politicians choose sentences above the social optimum!

## Conclusion

Using the Laffer curve methodology to explore the divergence between the offender sentence policy prescriptions of the traditional economic models and apparent practice offers a timely insight into a possible predicament confronting society. However, the Clark and Lee conclusion that there will be a transitional gains trap in sentences and prison space is not inevitable. In fact, it can be shown under plausible assumptions about criminal behavior, and the social and political trade-offs between sentences and prison space, that politicians may choose more prison space and longer sentences than society desires. Additionally, declining criminal sanctions and prison overcrowding are a set of stylized facts which admit many explanations, including both the traditional models and the Laffer-based analysis. Choosing from among the paradigms becomes an empirical matter rather than a matter of reliance on the force of persuasive discourse. Clark and Lee, in applying the Laffer curve methodology to criminal justice practice, have spawned a fertile avenue of research for scholars who follow them. **SSQ**

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