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# An Empirical Note on the Laffer Curve

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*An important policy question is what influence the U.S. highest marginal tax rate (HMTR) has on U.S. real individual income taxes receipts (adjusted for inflation) collected by the government ala the Laffer curve. The Laffer curve shows that while increases in the HMTR may increase tax receipts, eventually they decrease tax receipts because the HMTR discourages production and hence GDP and the income of taxpayers. The Laffer curve acts like own-price elasticity of demand. If the government raises prices (i.e., the tax rate) when demand is inelastic, total revenues (i.e., total tax receipts) increase. However, if the government raises prices (i.e., tax rates) when demand is elastic, total revenues (i.e., total tax receipts) fall. So when the economy is in the elastic segment of the demand or Laffer curve and the government wants to raise tax receipts, it needs to cut the tax rate. The Laffer curve theory was the primary justification of tax cuts in the Tax Reform Act of 1981 in the U.S.*

*The test performed here is crude as it does not utilize average marginal tax rates (AMTR). However, this is less of a shortcoming than one may think, as the calculation of the AMTR is controversial with at least three different approaches possible (see e.g., Rym and Koray, 2004).*

**Table 1**  
**The Relationship Between Natural Log HMTR (dependent variable) and the Natural Log of Real Individual Income Tax Revenues (independent variable) in the United States**

A. TOTAL SAMPLE OF HMTR (N = 46)

Constant	4.7 (12.6)*
ln HMTR	-.91 (-9.8)*
Adjusted R <sup>2</sup>	0.69

B. SAMPLE WITH HMTR ≤ 40% (N = 18)

Constant	-1.39 (-1.44)
ln HMTR	0.78 (2.92)*
Adjusted R <sup>2</sup>	0.35

C. SAMPLE WITH HMTR > 40% (N = 28)

Constant	6.0 (7.53)*
ln HMTR	-1.24 (-6.6)*
Adjusted R <sup>2</sup>	0.62

Notes: Two-tailed t-tests are reported in parentheses.

\*Statistically significant at the one percent level or better.

In Table 1 I show the results of testing the relationship between natural log of HMTR and the natural log of real individual income tax revenues (i.e., adjusted for inflation) in the U.S. I find, using OLS, that for the 46 years from 1959 to 2004 the adjusted coefficient of determination (R<sup>2</sup>) between these two variables = .69.<sup>1</sup> This means that 69 percent of the variance in real individual income tax revenues is

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statistically explained by the HMTR. Clearly, for the entire sample, the HMTR has a statistically significant and negative linear influence on real individual income tax revenues in the U.S. at the one percent level or better.<sup>2</sup> While there are obviously numerous other factors at work, this crude test of the Laffer curve does provide justification for tax cuts to raise tax revenues.<sup>3</sup> But at what levels should tax cuts rather than tax increases be implemented if the goal is to increase the government's tax revenues?

To answer this, it is instructive to parse the total sample into two parts: (1) real tax revenues when the HMTR was  $\leq 40$  percent and (2) real tax revenues when the HMTR was  $> 40$  percent.<sup>4</sup> When run in natural logs, the real tax revenues were positively and significantly related at the one percent level or better when HMTR was  $\leq 40$  percent with an  $R^2 = .35$ . In contrast, the real tax revenues were negatively and significantly related at the one percent level or better when HMTR was  $> 40$  percent with an  $R^2 = .62$ . This means a tax increase would increase real tax revenues if  $HMTR \leq 40$  percent. In context, a tax increase would decrease real tax revenues if  $HMTR > 40$  percent. If one believes the relationship is reasonably described in an elasticity or double log functional form, this suggests a Laffer type of relationship with real tax revenues rising at lower marginal tax rates, but falling at higher marginal tax rates.

## References

*Economic Report of the President* (2005) U.S. Government Printing Office, Washington DC.

Opalka, E. (2003). The history of federal individual income tax rates, *How to Protect and Manage Your 401K*. The Career Press, Franklin, NJ, Figure 3-3, 43-44. Opalka uses tax data from the Congressional Joint Committee on Taxation and the Internal Revenue Code.

Rym, E. and F. Koray (2004). Average Marginal Tax Rates in the UK Economy, *Applied Economics*, Vol. 36, No. 21, pp. 2369-2372.

## Endnotes

Once again, I am indebted to Dr. David B. Robinson, Won Joong Kim and Nell Hemphill for their valuable suggestions. The usual disclaimer for them applies.

<sup>1</sup> The HMTR data are from Opalka (2003, pp. 43-44). The real individual income tax receipts (on-budget and off-budget) data are from the *Economic Report of the President* (2005), Table B-80. The consumer price index (CPI-U) used for adjusting data are from the *Economic Report of the President* (2005), Table B-60.

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<sup>2</sup> Our results are virtually identical if real per capital individual tax receipts are used instead of real total individual tax receipts.

<sup>3</sup> Of course, the usual pitfalls and limitations associated with correlation analysis holds (see e.g., any statistics or econometrics textbook). In particular, the Durbin-Watson statistics indicated positive autocorrelation that I could not eliminate or reduce to an insignificant level with any reasonable additional explanatory variables, such as including population, or alternative functional forms, such as levels.

<sup>4</sup> The range of HMTR over the years 1959 to 2004 is 28 to 91 with a mean of 57.4 percent.