A First Lesson in Econometrics

Every budding econometrician must learn early that it is never in good taste to express the sum of two quantities in the form:

$$1 + 1 = 2. \tag{1}$$

Any graduate student of economics is aware that

$$1 = \ln e, \tag{2}$$

and further that

$$1 = \sin^2 q + \cos^2 q. \tag{3}$$

In addition, it is obvious to the casual reader that

$$2 = \sum_{n=0}^{\infty} \frac{1}{2^n}. \tag{4}$$

Therefore equation (1) can be rewritten more scientifically as

$$\ln e + (\sin^2 q + \cos^2 q) = \sum_{n=0}^{\infty} \frac{1}{2^n}. \tag{5}$$

It is readily confirmed that

$$1 = \cosh p \sqrt{1 - \tanh^2 p}, \tag{6}$$

and since

$$e = \lim_{\delta \to \infty} \left(1 + \frac{1}{\delta}\right)^{\delta}, \tag{7}$$

equation (5) can be further simplified to read:

$$\ln\left[\lim_{\delta \to \infty} \left(1 + \frac{1}{\delta}\right)^{\delta}\right] + (\sin^2 q + \cos^2 q) = \sum_{n=0}^{\infty} \frac{\cosh p\sqrt{1 - \tanh^2 p}}{2^n}. \tag{8}$$

If we note that

$$0! = 1, \tag{9}$$

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and recall that the inverse of the transpose is the transpose of the inverse, we can unburden ourselves of the restriction to one-dimensional space by introducing the vector X, where

$$(X')^{-1} - (X^{-1})' = 0. \tag{10}$$

Combining equation (9) with equation (10) gives

$$[(X')^{-1} - (X^{-1})']! = 1, \tag{11}$$

which, when inserted into equation (8) reduces our expression to

$$\ln\left\{\lim_{\delta \to \infty}\left\{[(X')^{-1} - (X^{-1})'] + \frac{1}{\delta}\right\}\right\} + (\sin^2 q + \cos^2 q) = \sum_{n=0}^{\infty} \frac{\cosh p\sqrt{1 - \tanh^2 p}}{2^n}. \tag{12}$$

At this point it should be obvious that equation (12) is much clearer and more easily understood than equation (1). Other methods of a similar nature could be used to simplify equation (1), but these will become obvious once the young econometrician grasps the underlying principles.

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