From: Kieran Murray
Sent: Tuesday, 27 September 2016 3:41 p.m.
To: Greg Akehurst
Subject: using average wage to estimate Vott
Attachments: Tax on Annual Income Calculator PDF (1).pdf; hourly wage based estimate of VoTT.xlsx; Wallis et al travel time saving assessment.pdf

Hi Greg

I mentioned during our discussion that I had attempted (since seeing your review numbers) to proxy the leisure value of travel time (VoTT) using average wage data as a further cross check. Following our meeting this morning, I have put those numbers into a small spreadsheet and calculated the tax adjustment correctly. This method produces a value of $48 - $51 (rather than the $40 odd I suggested during our discussion; I had applied an incorrect tax rate in initial attempt).

The approach follows the assumption that individuals adjust the amount of time they devote to work and leisure such that an additional small increment of either may be valued at the wage rate (see note 98 in CBA report). There are of course reasons why the cost at the margin could vary substantially given constraints on individuals to alter work or leisure schedules etc. Taking this after tax wage rate as a proxy for land transport, I then escalates that value by the mean or median of the ratios found in international studies for the difference between land transport and airport transport rates (these are listed in table 36 of the CBA report, and summarised in the attached). Using the median gives the $48 result, and the mean $51 (average of these values, is $49.64).

This now gives me estimates from 5 approaches:

Approach	Leisure VoTT
Australian Civil Aviation Authority values, inflated to 2015/16 and adjusted to $NZ	$57.02 (used in CBA)
Australian values adjusted for income difference and transport income elasticity	$56.54
Applying transport mode relativity using business values as base	$59.39
Using wage rate as base and applying transport mode relativity	$49.64
Applying transport mode relativity (from one study) using leisure values as base	$31.36 (applied by M.E)

These estimates might suggest that the estimate I adopted for the CBA is toward the upper end of the range, but it also suggests that the estimate adopted by M.E using the land transport leisure travel values might be somewhat of an outlier. To understand why that might be, I have had another look at the Willis et al study into the NZTA method for estimating travel times (reference at footnote 110 of CBA report). That report (commissioned by NZTA) observes that in 2013, the NZTA moved to an "equity" approach to estimating leisure value (but not business travel value) – it adopts a value for leisure that is independent of the incomes of travellers on the basis that this will lead to a more equitable use of public funds.

Willis et al point out that "equity' values (that bear no relationship to behavioural or market-based values) are potentially problematic in the application to commercial projects – where market-based values would be more effective in signalling true resource costs to private sector participants. They point out that 'equity values' may be highly misleading where applied to schemes which trade off time savings against money costs. See chapt 6 of Willis et al (attached).

On this research, I remain reasonably comfortable with the estimate we used though acknowledge it is higher than some. However, an estimate based on the NZTA equity value for leisure would seem to me difficult to support.

Kind regards

Kieran

Kieran Murray • Managing Director
sapere research group limited • www.srgexpert.com • Level 9, 1 Willeston St, PO Box 587, Wellington 6140

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