

## Department of Treasury and Finance, South Australia

### Critique of “Modelling of post-compulsory school enrolments” by Stephen Lamb

There are a number of serious problems with the modelling methodology that would need to be addressed before the results could be used to inform state and territory funding adjustments.

#### Data

- For states such as SA that have a high proportion of part-time students in post-compulsory years, an arbitrary assignment of 0.5 to a part-time student could make a difference to funding arrangements. The researchers should collect the necessary data to apportion the actual part-time ratio by SSD.

#### Explanatory variables

- The 15-19 year old unemployment rate is determined for ages 15-17 by state policy factors and therefore cannot be interpreted to be a ‘non-policy’ independent explanatory variable. Many states have introduced a 16 year old mandatory school leaving age and a 17 year old mandatory earning or learning age. These policies directly influence the 15-19 year old unemployment rate. The adult (20 and over) unemployment rate would be a more appropriate proxy variable for the state of the economy.

#### Model specification

- The model specified in table 7 cannot be interpreted as ‘excluding non-policy factors’. In this model the state dummy variables must represent all state specific effects, that is both policy and non-policy factors. The model implicitly takes account of all state effects – differences in policy, geography, socio-economic status and economy differences. The discussion relating to paragraphs 36 to 39 and table 7 is therefore flawed.

#### Approach to statistical inference

- The ‘policy effects’ variable can either be represented as a binary or dummy variable whereby states and territories included in the regression are compared to a reference state or by effects coding whereby each state and territory is compared to the mean for all states and territories. However in both representations there is only one variable, which is a ‘joint variable’. The hypothesis that is being tested is whether state and territory policy factors significantly influence post-compulsory school enrolments.
- As the policy effects variable is a ‘joint variable’ it is not possible to test the individual contribution of each state to the overall policy effect. The effects coding method only allows the hypothesis to be tested that a state’s post-compulsory enrolment rate is significantly different to the unweighted average (mean) post-compulsory enrolment rate.

#### Interpretation of results

- As discussed, dummy variables, or in this case, effect coded variables should be interpreted as a joint variable. There is no ‘individual state effect’. The hypothesis that can be tested is

whether the enrolment rate of a state or territory is significantly different to the unweighted mean enrolment rate. The test does not estimate the contribution of state differences. All that can be tested is whether a state's participation rate is significantly different to the unweighted mean. The sum of differences from the mean by definition, must be equal to zero. The discussion relating to paragraphs 45 to 48, paragraph 50 and table 10 is flawed and should be removed.

- With the information provided by the researcher, it is not possible to interpret the age-grade modelling results. The researcher does not provide any information about the specification of the model, or how a variable to capture 'age-grade' effects was derived.

#### Overall modelling approach

- It is standard econometric practice to include all regression output in an appendix so that the modelling can be verified by external reviewers. It has been difficult to ascertain the veracity of the modelling with the limited information that has been provided.

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