

COMMONWEALTH GRANTS COMMISSION METHODS AND THE PRODUCTIVITY COMMISSION REVIEW

Thursday, 26 October 2017

[This is a personal submission. I worked for the Grants Commission from 1983 to 1996, and for the then Industries Assistance Commission from 1976 to 1983. I have a Master degree in economics.

I had not intended to make a submission (at the age of 76), but walking for two weeks in Western Australia I recognised that I had some things to say about the Western Australia problem, and on simplicity and transparency.]

Abbreviations

The Productivity Commission is referred to as “PC”, the Grants Commission as “GC”, “the States” are taken to include Territories unless otherwise specified. Horizontal Fiscal Equalisation is referred to as “HFE”.

The averaging of relativities

The Productivity Commission’s draft report examines averaging in chapter 5 section 1. The PC concludes that, although averaging detracts from contemporaneity, offsetting cyclical factors is not the primary objective of horizontal fiscal equalisation (HFE).

This draft recommendation of the PC cannot be supported. Purportedly each of the years assessed achieves the best estimate of the distribution needed to achieve fiscal equalisation in that year. The most recent year relies on the most up to date data available and is the best *current* estimate of what is needed to achieve HFE. *All* changes affecting variables, including cyclical changes, should be taken into account to achieve HFE. (Maybe I should add that cycles are evident through rear vision glasses, but the length and outcomes of cycles are less obvious prospectively, otherwise many more people would be rich.)

Three objections to the use of averages should be noted:

1. Averaging is more likely to impair than enhance the achievement of HFE. This can be tested using GC data. The GC could compare retrospectively a contemporaneous assessment of a past year for which grants and all necessary data were known, with the results of a single year’s assessment two years in advance of this year, and with the corresponding three year average, all under common methods. (This should be done routinely, and reported on as a measure of quality control.) It is likely to show that the most recent year available provides a no less accurate estimate than the average of three years, and probably a better estimate.
2. If reducing the volatility of grants were an objective sufficiently important to allow it to impair HFE, it should be done directly by, for example, setting maximums for the proportional changes in grants, not by the indirect, wasteful and possibly perverse effects of averaging previous assessments.
3. Averaging all but prevents the achievement of simplicity and transparency of GC recommendations. This is discussed later in the submission under the heading of “the Analysis of Changes and Simplicity and Transparency”.

Taking up point 1, revenues and expenditures should be considered separately.

Revenues are sometimes volatile even though tax rates remain unchanged, particularly for mining royalties and for stamp duties on conveyances. Such changes confer large increases or decreases in the capacities of States to fund their own needs. So they are properly more or less needful of general purpose grants.

(It should be noted that specific purpose grants (SPPS) treated by GC as equivalent to funding general revenue needs of States are formally (mathematically) equivalent to revenues as sources of funds to States, except that *actual* receipts of each State are treated as *standardised* revenues.)

Clearly the averaging of relativities over three years has a perverse effect on Western Australia because they reflect a legacy of boom in mining royalties which no longer applies. At the same time, averaging provided Western Australia with above standard levels of service when the boom was ramping up. Something similar occurred to New South Wales years earlier when a property boom collapsed, and stamp duties revenues too.

Given this, what is the situation with **expenditure**? It should be expected that expenditure assessments would be much less volatile from year to year than those of revenues. This can easily be checked and summarised statistically. I acknowledge the PC's request for supporting data for submissions and have noted figures 5.2 and 5.3 in the draft report. But I do not wish to spend one or two weeks examining GC reports and working papers.

Expenditure assessments are affected only by:

- State shares of population;
- the Australian average of State expenditures per capita (adjusted by the GC into a standard budget incorporating the values for all States); and
- a multiplier reflecting the expenditure category's relative advantages or disadvantages of each State compared to those of other States and Territories.

In update years, the GC methods do not change. Even periodic reviews should result in moderate changes, at least in terms of percentage changes. Large changes by the Commission in reviews implicitly acknowledge large errors in previous assessments.

In principle, averaging could be justified by reversion to the mean, such that each latest year contains anomalies that tend to be removed over time. The changes in expenditure assessments as much as those of revenue are likely to follow trends rather than reverting to earlier values. It is for example in the nature of age distributions that they change gradually. For example, the collapse of a mining boom may lead to an exit of population from a State, and vice versa, but the effect is rarely dramatic.

For the record any idea that the broader judgments of the GC would become more accurate if averaged over three years would be an appalling claim.

Nothing I have said critical of averaging would support the use of projections into the future or attempts to include guesses about future years.

In my experience neither I nor anyone else thought to question the averaging of results for several years to produce a recommendation to the Commonwealth. It is difficult to understand our failure. Averages at best provide a steadiness and reflect, I believe, excessive caution. It is

important to the quality of the HFE process that the GC should be able to justify its assessments with reference to every *single* year.

Averaging also makes the calculation and understanding of the changes to relativities all but impossible, not least for Grants Commissioners themselves.

I suggest that the GC base recommendations to the Commonwealth on an assessment only of the latest year for which data are available. This should provide more up to date and accurate recommendations. It is also far simpler.

Simplicity and the Analysis of Changes

It used to be that the GC's model as applied to each year was a simple matrix equation, and so mathematical techniques exist to estimate systematically individual changes and to analyse overall changes in terms of past grants and estimates of prospective grants. However, the Grants Commission used a stepwise approach to analyse changes such that the size of the change associated with a particular category's relativity depends on the order in which changes are modelled. This stepwise method is not capable of providing information in advance to Commissioners about the effects of particular assessments on overall outcomes.

For use in prospect the orthodox mathematical technique is to use the "total differential" which, for the multiplication of population, "standard" expenditure and either multiplicative or additive "disabilities" provides good first order approximations. For analysis of changes in connection with an update or a review, the total differential again accounts for most of the overall change, allowing immediate identification of the largest changes.

[The *technical approach* is the approximation of a function using a Taylor's series expansion. While first order differentials provide a good approximation, in tests I did second order differentials representing interactions among "disability factors" were significant enough to be needed to accurately model overall changes in grants. The important point is that the technical aspects can be made invisible if the maths is incorporated into the computer system used in connection with the GC's model. The maths would be understood by anyone with two years of university maths.

Three points should be made. The bounds of the maximum possible error can be calculated from the remainder of the Taylor's series. The interactions mainly occur in assessments of States with large disabilities like the Northern Territory. It is also important to check that the changes are within the bounds needed for the series to converge to a finite sum.]

A differential approach is more accurate the smaller the percentage changes reflected in the model. It could not, for example, model changes of 100 per cent or more. Such a change would have to be made stepwise and the differentials applied to the hypothetically changed outcome in the base year. One hopes that change of this order are rare, both in the average per capita expenditures and revenues of States from year to year, and in the GC's assessments of relativities. The shares of population affect outcomes in each component of assessment by a common percentage.

The use of a single base year allows Grants Commissioners to chase every rabbit down its hole. For illustration purposes only, everything could be expressed in terms of a range of changes, for example corresponding to upper and lower bounds for population changes in each State, and on bounds for GST collections (eg from a lower bound of the percentage increase in population, and a higher projected increase in collections from earlier experience).

The GC should provide their computer model for each base year to the States, incorporating the techniques to analyse changes, so that they are able to do their own modelling. The GC should also provide training to the States on using the model, and modelling prospective and retrospective changes should there be a demand.

The benefits of these proposals

Changes in grants can be modelled both prospectively and hypothetically with reference to the most recent, base year. The Commissioners are then able to focus on the most important changes and be able to give a compact account of the reasons for change. Such analyses would help to avoid errors in calculations or transcription by showing outliers. With the comparison of only two years, the GC's attention can be directed to understanding the reasons for every change of consequence. For example, this would give the GC a capacity to phase in changes to elements of assessment over a period in response to unexpectedly large sources of change, but one hopes such interference with HFE would be exceptional.

Analogously officers of State governments can analyse change more compactly and explain to their governments the reasons for changes in grants. This too acts as a means to detect any errors in the GC's methods.

It also empowers the State to examine those assessments for which it has a grievance. This may lead to some empirical modelling by the State using State data to which the Commission has no access to criticise the assessment and suggest the means to test and question it.

Overall it would provide a radical improvement in simplicity. Journalists would be able to understand the outcomes, and have less reason to comment on the impenetrability of the Commission's results. Indeed averaging and the associated obscurity of outcomes have protected the GC recommendations from closer examination.

The head office (economies of) scale factors

So far as I know, these factors lack any empirical basis whatsoever. They are based purely on speculation. My conviction is that they overcompensate all States purported to be disadvantaged. Why, for example, would Queensland and Western Australia suffer from head office scale disadvantage of more than inconsequential magnitude with reference to New South Wales and Victoria, both assessed as operating at efficient scale levels. As Queensland and Western Australia grow to populations formerly the sizes of Victoria and New South Wales, they never seem to approach efficient scale levels according to GC's assessments.

My objections however are not founded only on the absence of reliable evidence to support the factors. I believe they have no place in fiscal equalisation. Suppose Tasmania split into two States, north and south, their total grants would increase a lot due to "scale", and the other States would receive consequently lower grants, an inefficient outcome. There should be a threshold requirement for States and Territories to discourage inefficiency in its broadest lay sense.

As matters of fact, the range and complexity of issues requiring head office oversight in large States would far exceed those in small States. The coordination task in a large State is far greater than in a small State.

The consequences of any small scale inconveniences could be diminished by teleconferencing, by cooperation with other States, borrowing knowledge from other States. Smaller States tend to spend more money per capita on assistance to industry, like agriculture, tourism and tax holidays or exemptions than other States with money supplied at the expense of larger States by the head office “scale” factor. Most have a higher standard of political representation.

If the head office scale factors were to be phased out over a period of up to ten years, it would make a worthwhile improvement in efficiency, following the PC’s terms of reference. It is the only way to give an incentive for smaller States to produce some empirical evidence that scale is not simply a fudge factor and for larger States the opportunity to respond in kind.

Phillip Bubb

ACT