# Transition code notes

The purpose of this document is to note the input files and code that are needed to replicate the results in Appendix F of the Productivity Commission’s *Horizontal Fiscal Equalisation* final report, and to detail the variable names that are used in the calculations.

### Input files and code

There are seven input files each in the \*.xlsx format. Details of projection methodology can be found in Appendix F.

* ‘Average relativites.xlsx’ – contains current and projected relativities for each State between 2018-19 to 2026-27 using the current benchmark, where projected relativities are an average of relativity forecasts from contributing State Treasuries. Also contains a relativity code (‘A’).
* ‘Long-term relativities.xlsx’ - contains current and projected relativities for each State between 2018-19 to 2026-27 using the current benchmark, where projected relativities are assumed to return to their long run averages in the first period after the forward estimates. Also contains a relativity code (‘L’).
* ‘Current relativities.xlsx’ - contains current and projected relativities for each State between 2018-19 to 2026-27 using the current benchmark, where projected relativities are assumed to stay at their current levels for the entire period. Also contains a relativity code (‘C’).
* ‘Central GST pool.xlsx’ – contains projected GST pool amounts (in $ millions) for the period 2018-19 to 2026-27. Also contains a pool code (‘C’).
* ‘MYEFO populations.xlsx’ – contains projected population estimates (in millions) for each State for the period 2018-19 to 2026-27. Also contains a population code (‘M’).
* ‘state\_rev.xlsx’ – contains historical and projected State revenues for the period 2000-01 to 2020-21.
* ‘gst\_payments.xlsx’ – contains historical GST payments to each State between 2000-01 and 2017-18.

### Structure of R code

The code is in five short sections.

* The first section (lines 11 to 37) reads in data from the input sheets and combines it into a single data frame named ‘data’. The data is stored in a long format, where each combination of input variables (State, year, relativity projection methodology, and transition period) is stored in a separate row. For example, the data for NSW (State), in the year 2020 (year), using average relativities (relativity projection methodology) and a four year transition (transition period) is stored in a single row. All calculations in this row then relate to that combination of input variables.
* The second section (lines 41 to 50) calculates GST payments under the current standard. Each step in the calculation is stored as a new variable in the data frame.
* The third section (lines 56 to 73) projects non-GST revenue for the period 2018-19 to 2026-27 and adds this to the data frame.
* The fourth section (lines 79 to 105) calculates GST payments under the new standard, and calculates relevant indicators for Appendix F. It also sets the standard to be equalised to in the variable ‘standard’ (line 79). This is set to 1 for ETA but any standard can be chosen here. Each step in the calculation is stored as a new variable in the data frame.
* The fifth section (lines 111 to 113) simply extracts any data of interest.

### Variable names

After running all lines of code the ‘data’ data frame has the following 36 variable names.

| Table 1 Variable names |
| --- |
| | Name | Description | | --- | --- | | Variables from input sheets | | | YEAR | Years are the start of the financial year. For example year 2008 refers to the 2008-09 financial year. | | STATE | Each State coded as NSW, VIC, QLD, WA, SA, TAS, ACT, NT | | REL | The projected relativity for the year under the current benchmark | | RELCODE | The projection methodology used to calculate the relativity contained in REL. | | POP | The projected population for the state in the given year | | POPCODE | The projection methodology used to calculate the relativity contained in POP. | | POOL | The projected GST pool size for the given year | | POOLCODE | The projection methodology used to calculate the pool contained in POOL. | | REV\_NONGST | Non-GST revenue for the State (part of this is calculated in the code) | |  | (continued next page) | |
|  |
|  |

| Table 1 (Continued) |
| --- |
| | Name | Description | | --- | --- | | Calculated values stored in data frame | | | POPSHARE | Population share of the State | | ADJPOP | Adjusted population of the State | | ADJPOPTOT | Total adjusted population (Australia wide) | | ADJPOPSHARE | Adjusted population share of the State | | BASELINE | GST payment to the State using the current benchmark | | BASELINE\_PER\_CAPITA | Per capita GST payment to the State using the current benchmark | | EPC | GST payment to the State if the pool was distributed equal per capita | | EFFECTIVE\_REL | Effective relativity | | ABOVE\_STANDARD | Dummy variable equal to 1 if the State has a relativity above the standard (set in line 79) or 0 otherwise. | | STANDARD\_DEFICIT | The distance between the State’s effective relativity (using the current benchmark) and the equalisation standard. | | EPC\_CONTRIBUTION | Intermediate step needed for SUM\_EPC\_CONTRIBUTION | | SUM\_EPC\_CONTRIBUTION | The proportion of the pool to be distributed EPC | | PER\_CAPITA\_ETA | Per-capita GST payment using the new benchmark. For the fiscally strong States (relativity below 1.0), this is its EPC payment multiplied by the proportion of the pool to be paid EPC. For fiscally weak States (relativity above 1.0), this is its EPC payment times by the proportion of the pool to be paid EPC, plus its equalisation payment. | | GST\_TOTAL\_ETA | Total GST payment (in $ millions) | | REL\_ETA | Effective relativity under ETA | | POLICY | The transition period length (four year or eight year) | | X\_YEAR\_WEIGHT | ETA weight to be used in that year, according to the transition path contained in POLICY | | GST\_X\_YEAR | Total GST payments under the transition path contained in POLICY | | GST\_PER\_CAPITA\_X\_YEAR | Per capita GST payments under the transition path contained in POLICY | | REL\_ETA\_X\_YEAR | Effective relativity under the transition path contained in POLICY | | CHANGE\_GST\_X\_YEAR | Change in GST payments ($ million) relative to baseline, under the transition path contained in POLICY | | PER\_CAPITA\_CHANGE\_GST  \_X\_YEAR | Per capita change in GST payments ($) relative to baseline, under the transition path contained in POLICY | | RATE\_OF\_CHANGE\_X\_YEAR | Change in GST payments from year-to-year ($ million), relative to baseline payment, under the transition path contained in POLICY | | PERCENT\_CHANGE\_X\_YEAR | Change in GST payments relative to baseline payment, under the transition path contained in POLICY, as a proportion of State revenue | | PERCENT\_RATE\_OF\_  CHANGE\_X\_YEAR | Change in GST payments from year-to-year ($ million), relative to baseline payment, under the transition path contained in POLICY, as a proportion of total State revenue | |
|  |
|  |