Title

tsappend — Add observations to a time-series dataset

Syntax

```
tsappend , { add(#) | last(date | clock) tsfmt(string) } [options]
```

options	Description
* `add(#)`	add # observations
* `last(date | clock)`	add observations at *date* or *clock*
* `tsfmt(string)`	use time-series function *string* with `last(date | clock)`
`panel(panel_id)`	add observations to panel *panel_id*

* Either `add(#)` is required, or `last(date | clock)` and `tsfmt(string)` are required.
You must `tsset` your data before using `tsappend`; see [TS] **tsset**.

Menu

Statistics > Time series > Setup and utilities > Add observations to time-series dataset

Description

`tsappend` appends observations to a time-series dataset or to a panel dataset. `tsappend` uses and updates the information set by `tsset`.

Options

`add(#)` specifies the number of observations to add.

`last(date | clock)` and `tsfmt(string)` must be specified together and are an alternative to `add()`.

`last(date | clock)` specifies the date or the date and time of the last observation to add.

`tsfmt(string)` specifies the name of the Stata time-series function to use in converting the date specified in `last()` to an integer. The function names are `tc` (clock), `tC` (Clock), `td` (daily), `tw` (weekly), `tm` (monthly), `tq` (quarterly), and `th` (half-yearly).

For clock times, the last time added (if any) will be earlier than the time requested in `last(date | clock)` if `last()` is not a multiple of delta units from the last time in the data.

For instance, you might specify `last(17may2007) tsfmt(td)`, `last(2001m1) tsfmt(tm)`, or `last(17may2007 15:30:00) tsfmt(tc)`.

`panel(panel_id)` specifies that observations be added only to panels with the ID specified in `panel()`.

Remarks and examples

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Remarks are presented under the following headings:

Introduction

`tsappend` adds observations to a time-series dataset or to a panel dataset. You must `tsset` your data before using `tsappend`. `tsappend` simultaneously removes any gaps from the dataset.

There are two ways to use `tsappend`: you can specify the `add(#)` option to request that # observations be added, or you can specify the `last(`*date* | *clock*`)` option to request that observations be appended until the date specified is reached. If you specify `last()`, you must also specify `tsfmt()`. `tsfmt()` specifies the Stata time-series date function that converts the date held in `last()` to an integer.

`tsappend` works with time series of panel data. With panel data, `tsappend` adds the requested observations to all the panels, unless the `panel()` option is also specified.

Using tsappend with time-series data

`tsappend` can be useful for appending observations when dynamically predicting a time series. Consider an example in which `tsappend` adds the extra observations before dynamically predicting from an AR(1) regression:

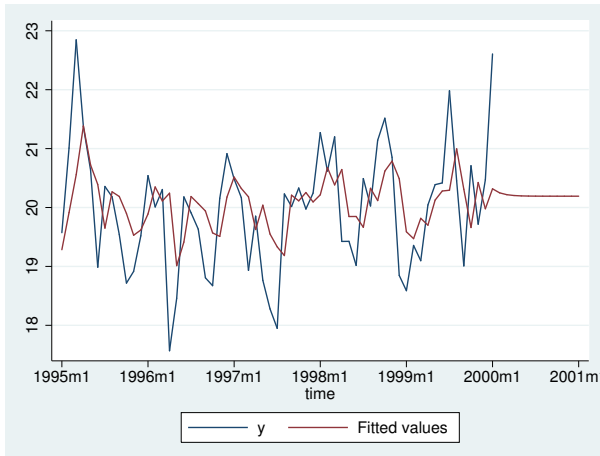
```
. use http://www.stata-press.com/data/r13/tsappend1
. regress y l.y
      Source |       SS       df       MS              Number of obs =     479
-------------+------------------------------           F(  1,   477) =  119.29
       Model |  115.349555     1  115.349555           Prob > F      =  0.0000
    Residual |  461.241577   477  .966963473           R-squared     =  0.2001
-------------+------------------------------           Adj R-squared =  0.1984
       Total |  576.591132   478   1.2062576           Root MSE      =  .98334

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
           y |
         L1. |   .4493507   .0411417    10.92   0.000     .3685093    .5301921
             |
       _cons |   11.11877   .8314581    13.37   0.000     9.484993    12.75254
------------------------------------------------------------------------------
. mat b = e(b)
. mat colnames b = L.xb one
. tsset
        time variable:  t2, 1960m2 to 2000m1
                delta:  1 month
. tsappend, add(12)
. tsset
        time variable:  t2, 1960m2 to 2001m1
                delta:  1 month
. predict xb if t2<=tm(2000m2)
(option xb assumed; fitted values)
(12 missing values generated)
```

```
. gen one=1
. mat score xb=b if t2>=tm(2000m2), replace
```

The calls to `tsset` before and after `tsappend` were unnecessary. Their output reveals that `tsappend` added another year of observations. We then used `predict` and `matrix score` to obtain the dynamic predictions, which allows us to produce the following graph:

```
. line y xb t2 if t2>=tm(1995m1), ytitle("") xtitle("time")
```



In the call to `tsappend`, instead of saying that we wanted to add 12 observations, we could have specified that we wanted to fill in observations through the first month of 2001:

```
. use http://www.stata-press.com/data/r13/tsappend1, clear
. tsset
        time variable:  t2, 1960m2 to 2000m1
                delta:  1 month
. tsappend, last(2001m1) tsfmt(tm)
. tsset
        time variable:  t2, 1960m2 to 2001m1
                delta:  1 month
```

We specified the `tm()` function in the `tsfmt()` option. [D] **functions** contains a list of time-series functions for translating date literals to integers. Because we have monthly data, and since [D] **functions** tells us that we want to use the `tm()` function, we specified the `tsfmt(tm)` option. The following table shows the most common types of time-series data, their formats, the appropriate translation functions, and the corresponding options for `tsappend`:

Description	Format	Function	Option
time	`%tc`	`tc()`	`tsfmt(tc)`
time	`%tC`	`tC()`	`tsfmt(tC)`
daily	`%td`	`td()`	`tsfmt(td)`
weekly	`%tw`	`tw()`	`tsfmt(tw)`
monthly	`%tm`	`tm()`	`tsfmt(tm)`
quarterly	`%tq`	`tq()`	`tsfmt(tq)`
half-yearly	`%th`	`th()`	`tsfmt(th)`
yearly	`%ty`	`ty()`	`tsfmt(ty)`

Using tsappend with panel data

tsappend's actions on panel data are similar to its action on time-series data, except that tsappend performs those actions on each time series within the panels.

If the end dates vary over panels, last() and add() will produce different results. add(#) always adds # observations to each panel. If the data end at different periods before tsappend, add() is used, the data will still end at different periods after tsappend, add(). In contrast, tsappend, last() tsfmt() will cause all the panels to end on the specified last date. If the beginning dates differ across panels, using tsappend, last() tsfmt() to provide a uniform ending date will not create balanced panels because the number of observations per panel will still differ.

Consider the panel data summarized in the output below:

```
. use http://www.stata-press.com/data/r13/tsappend3, clear
. xtdescribe
      id:  1, 2, ..., 3                                        n =          3
      t2:  1998m1, 1998m2, ..., 2000m1                         T =         25
           Delta(t2) = 1 month
           Span(t2)  = 25 periods
           (id*t2 uniquely identifies each observation)
Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                        13      13      13        20        24      24      24
     Freq.  Percent    Cum. |  Pattern
 ---------------------------+-------------------------
        1     33.33   33.33 |  ............1111111111111
        1     33.33   66.67 |  1111.11111111111111111111
        1     33.33  100.00 |  11111111111111111111.....
 ---------------------------+-------------------------
        3    100.00         |  XXXXXXXXXXXXXXXXXXXXXXXXX
. by id: summarize t2
-------------------------------------------------------------------------------
-> id = 1
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        13         474     3.89444       468        480
-------------------------------------------------------------------------------
-> id = 2
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        20       465.5     5.91608       456        475
-------------------------------------------------------------------------------
-> id = 3
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        24    468.3333    7.322786       456        480
```

The output from xtdescribe and summarize on these data tells us that one panel starts later than the other, that another panel ends before the other two, and that the remaining panel has a gap in the time variable but otherwise spans the entire time frame.

Now consider the data after a call to `tsappend, add(6)`:

```
. tsappend, add(6)
. xtdescribe
      id:  1, 2, ..., 3                                       n =          3
      t2:  1998m1, 1998m2, ..., 2000m7                        T =         31
           Delta(t2) = 1 month
           Span(t2)  = 31 periods
           (id*t2 uniquely identifies each observation)
Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                        19      19      19        26        31      31      31
     Freq.  Percent    Cum. |  Pattern
 ---------------------------+-------------------------------
        1     33.33   33.33 |  ............111111111111111111
        1     33.33   66.67 |  1111111111111111111111111.....
        1     33.33  100.00 |  1111111111111111111111111111111
 ---------------------------+-------------------------------
        3    100.00         |  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
. by id: summarize t2
-------------------------------------------------------------------------------
-> id = 1
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
          t2 |         19         477    5.627314        468        486
-------------------------------------------------------------------------------
-> id = 2
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
          t2 |         26       468.5    7.648529        456        481
-------------------------------------------------------------------------------
-> id = 3
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
          t2 |         31         471    9.092121        456        486
```

This output from `xtdescribe` and `summarize` after the call to `tsappend` shows that the call to `tsappend, add(6)` added 6 observations to each panel and filled in the gap in the time variable in the second panel. `tsappend, add()` did not cause a uniform end date over the panels.

The following output illustrates the contrast between `tsappend, add()` and `tsappend, last() tsfmt()` with panel data that end at different dates. The output from `xtdescribe` and `summarize` shows that the call to `tsappend, last() tsfmt()` filled in the gap in `t2` and caused all the panels to end at the specified end date. The output also shows that the panels remain unbalanced because one panel has a later entry date than the other two.

```
. use http://www.stata-press.com/data/r13/tsappend2, clear
. tsappend, last(2000m7) tsfmt(tm)
. xtdescribe
      id:  1, 2, ..., 3                                      n =          3
      t2:  1998m1, 1998m2, ..., 2000m7                       T =         31
           Delta(t2) = 1 month
           Span(t2)  = 31 periods
           (id*t2 uniquely identifies each observation)
Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                        19      19      19        31        31      31      31
     Freq.  Percent    Cum. |  Pattern
 ---------------------------+-------------------------------
        2     66.67   66.67 |  1111111111111111111111111111111
        1     33.33  100.00 |  ............111111111111111111
 ---------------------------+-------------------------------
        3    100.00         |  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
. by id: summarize t2
-------------------------------------------------------------------------------
-> id = 1
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        19         477    5.627314        468        486
-------------------------------------------------------------------------------
-> id = 2
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        31         471    9.092121        456        486
-------------------------------------------------------------------------------
-> id = 3
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          t2 |        31         471    9.092121        456        486
```

Stored results

tsappend stores the following in r():

Scalars

r(add)	number of observations added

Also see

[TS] **tsset** — Declare data to be time-series data