

Description

`xttab`, a generalization of `tabulate` (see [\[R\] `tabulate oneway`](#)), performs one-way tabulations and decomposes counts into between and within components in panel data.

`xttrans`, another generalization of `tabulate` (see [\[R\] `tabulate oneway`](#)), reports transition probabilities (the change in one categorical variable over time).

Quick start

Overall, between, and within one-way tabulation of `v1` using `xtset` data

```
xttab v1
```

Report transition probabilities for `v2`

```
xttrans v2
```

Add frequency of transitions

```
xttrans v2, freq
```

Same as above, but for each level of `catvar`

```
bysort catvar: xttrans v2, freq
```

Menu

xttab

Statistics > Longitudinal/panel data > Setup and utilities > Tabulate xt data

xttrans

Statistics > Longitudinal/panel data > Setup and utilities > Report transition probabilities

Syntax

```
xttab varname [ if ]
xttrans varname [ if ] [ , freq ]
```

A panel variable must be specified; use xtset; see [XT] xtset.
 by and collect are allowed with xttab and xttrans; see [U] 11.1.10 Prefix commands.

Option

Main

freq, allowed with xttrans only, specifies that frequencies as well as transition probabilities be displayed.

Remarks and examples

If you have not read [XT] xt, please do so.

➤ Example 1: xttab

Using the nlswork dataset described in [XT] xt, variable msp is 1 if a woman is married and her spouse resides with her, and 0 otherwise:

```
. use https://www.stata-press.com/data/r19/nlswork
(National Longitudinal Survey of Young Women, 14-24 years old in 1968)
. xttab msp
```

| msp | Overall | | Between | | Within |
|------------|---------|---------|---------|---------|---------|
| | Freq. | Percent | Freq. | Percent | Percent |
| 0 | 11324 | 39.71 | 3113 | 66.08 | 62.69 |
| 1 | 17194 | 60.29 | 3643 | 77.33 | 75.75 |
| Total | 28518 | 100.00 | 6756 | 143.41 | 69.73 |
| (n = 4711) | | | | | |

The overall part of the table summarizes results in terms of person-years. We have 11,324 person-years of data in which msp is 0 and 17,194 in which it is 1—in 60.3% of our data, the woman is married with her spouse present. Between repeats the breakdown, but this time in terms of women rather than person-years; 3,113 of our women ever had msp 0 and 3,643 ever had msp 1, for a grand total of 6,756 ever having either. We have in our data, however, only 4,711 women. This means that there are women who sometimes have msp 0 and at other times have msp 1.

The within percent tells us the fraction of the time a woman has the specified value of msp. If we take the first line, conditional on a woman ever having msp 0, 62.7% of her observations have msp 0. Similarly, conditional on a woman ever having msp 1, 75.8% of her observations have msp 1. These two numbers are a measure of the stability of the msp values, and, in fact, msp 1 is more stable among these younger women than msp 0, meaning that they tend to marry more than they divorce. The total within of 69.73% is the normalized between weighted average of the within percents, that is, $(3113 \times 62.69 + 3643 \times 75.75) / 6756$. It is a measure of the overall stability of the msp variable.

A time-invariant variable will have a tabulation with within percents of 100:

```
. xttab race
```

| race | Overall | | Between | | Within |
|-------|---------|---------|---------|---------|---------|
| | Freq. | Percent | Freq. | Percent | Percent |
| White | 20180 | 70.72 | 3329 | 70.66 | 100.00 |
| Black | 8051 | 28.22 | 1325 | 28.13 | 100.00 |
| Other | 303 | 1.06 | 57 | 1.21 | 100.00 |
| Total | 28534 | 100.00 | 4711 | 100.00 | 100.00 |

(n = 4711)



► Example 2: xttrans

xttrans shows the transition probabilities. In cross-sectional time-series data, we can estimate the probability that $x_{i,t+1} = v_2$ given that $x_{it} = v_1$ by counting transitions. For instance

```
. xttrans msp
```

| 1 if married, spouse present | 1 if married, spouse present | | Total |
|---------------------------------------|---------------------------------|-------|--------|
| | 0 | 1 | |
| 0 | 80.49 | 19.51 | 100.00 |
| 1 | 7.96 | 92.04 | 100.00 |
| Total | 37.11 | 62.89 | 100.00 |

The rows reflect the initial values, and the columns reflect the final values. Each year, some 80% of the msp 0 persons in the data remained msp 0 in the next year; the remaining 20% became msp 1. Although msp 0 had a 20% chance of becoming msp 1 in each year, the msp 1 had only an 8% chance of becoming (or returning to) msp 0. The freq option displays the frequencies that go into the calculation:

```
. xttrans msp, freq
```

| 1 if married, spouse present | 1 if married, spouse present | | Total |
|---------------------------------------|---------------------------------|-----------------|------------------|
| | 0 | 1 | |
| 0 | 7,697 80.49 | 1,866 19.51 | 9,563 100.00 |
| 1 | 1,133 7.96 | 13,100 92.04 | 14,233 100.00 |
| Total | 8,830 37.11 | 14,966 62.89 | 23,796 100.00 |



□ Technical note

The transition probabilities reported by `xttrans` are not necessarily the transition probabilities in a Markov sense. `xttrans` counts transitions from each observation to the next once the observations have been put in t order within i . It does not normalize for missing periods. `xttrans` does pay attention to missing values of the variable being tabulated, however, and does not count transitions from nonmissing to missing or from missing to nonmissing. Thus if the data are fully rectangularized, `xttrans` produces (inefficient) estimates of the Markov transition matrix. `fillin` will rectangularize datasets; see [D] [fillin](#). Thus the Markov transition matrix could be estimated by typing

```
. fillin idcode year
. xttrans msp
(output omitted)
```



Stored results

`xxtab` stores the following in `r()`:

Scalars

`r(n_panels)` number of panels

Matrices

`r(results)` results matrix

`xttrans` stores the following in `r()`:

Scalars

`r(n_trans)` number of transitions
`r(n_rows)` number of initial values (rows in output)
`r(n_cols)` number of final values (columns in output)

Also see

[XT] [xtdescribe](#) — Describe pattern of xt data

[XT] [xtsum](#) — Summarize xt data

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