

# PANELPIV

## Panel Local Projection Impulse Responses with IV

EViews Add-in Documentation

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# 1 Overview

PANELLPIV estimates Jordà (2005) local-projection impulse response functions on panel workfiles in EViews, with optional instrumental-variable identification. It fills a gap left by the native EViews 14 LPIRF object and the existing LOCALIRFS / SMLOCALIRFS add-ins, which are restricted to single-equation time-series data.

## Key features:

- Per-horizon 2SLS (LP-IV) — endogenous regressor instrumented at every horizon  $h = 0, \dots, H$ .
- Fixed-effects (FE) or mean-group (MG) pooling across cross-sections.
- Driscoll-Kraay (1998) standard errors — handles both within-unit serial correlation and cross-sectional dependence arising from network linkages or common shocks.
- Cluster-by-unit standard errors as an alternative.
- Automatic lag augmentation following Montiel Olea & Plagborg-Møller (2021) for uniform inference under persistence.
- Per-horizon first-stage  $F$  statistic for weak-instrument screening.
- Cumulative response calculation via automated differencing.

# 2 Installation

## 2.1 Command-line registration

Place `panellpiv.prg` in any folder and register it via the EViews Add-ins manager:

Add-ins → Manage Add-ins → Add

- **Program file:** `panellpiv.prg`
- **Command keyword:** `panellpiv`
- **Type:** Global

## 2.2 Requirements

- EViews 9 or later (matrix algebra functions used throughout).
- An active panel workfile structured with `xtset` / `pagestruct` — cross-section ID and date dimension must be set before calling the add-in.

# 3 Syntax

## 3.1 Command line

```
panellpiv(resp="y", imp="x", inst="z", ctrl="", lags=0,  
          hor=20, pool=fe, se=dk, bw=0, cumul)
```

All options are keyword-value pairs passed in parentheses. If no options are provided, a GUI dialog appears automatically.

## 3.2 Options

Option	Type	Default	Description
resp	string	<i>Required</i>	Response variable (LHS, will be led $h$ periods).
imp	string	<i>Required</i>	Impulse / endogenous regressor of interest.
inst	string	<i>blank</i>	Instrument(s) for imp. Blank triggers OLS local projection.
ctrl	string	<i>blank</i>	Explicit control variables. Overrides lags when supplied.
lags	integer	0	Number of lags of resp and imp to add as controls automatically.
hor	integer	20	Maximum impulse-response horizon $H$ .
pool	string	fe	Pooling: fixed-effects (fe) or Pesaran-Smith mean-group (mg).
se	string	dk	Standard errors: Driscoll-Kraay (dk) or cluster-by-unit (cluster).
bw	integer	0	Driscoll-Kraay Bartlett bandwidth. 0 triggers Newey-West rule.
cumul	flag	<i>off</i>	Calculates the cumulative response ( $y_{t+h} - y_{t-1}$ ).

## 3.3 GUI dialog

Running `panellpiv` with no arguments (or via the Add-ins menu) opens a dialog with labeled fields for all options. Fields left blank adopt the defaults shown in the table above.

Figure 1: GUI dialog

## 4 Estimation Details

### 4.1 Local projection

For each horizon  $h = 0, \dots, H$  the add-in estimates the panel regression:

$$y_{i,t+h} = \alpha_i + \beta_h x_{i,t} + \gamma_h' w_{i,t} + u_{i,t+h} \quad (1)$$

where  $\alpha_i$  are unit fixed effects,  $x_{i,t}$  is the impulse variable, and  $w_{i,t}$  are lag-augmented controls. The sequence  $\{\beta_h\}$  is the impulse response function. Each  $\beta_h$  is estimated independently, preventing specification errors at one horizon from propagating to others. If the `cumul` flag is provided, the dependent variable is mathematically transformed to  $y_{i,t+h} - y_{i,t-1}$ .

## 4.2 IV identification (LP-IV)

When an instrument list is supplied,  $x$  is treated as endogenous and the 2SLS estimator is applied at each horizon. The first stage regresses  $x$  on instruments  $z$  and controls  $w$ ; the predicted value  $\hat{x}$  is used in the second stage. Instrument relevance is reported via the per-horizon first-stage  $F$  statistic.

## 4.3 Pooling options

- `pool=fe` (default): Within-group demeaning removes unit fixed effects;  $\beta_h$  is estimated on the pooled demeaned data. Assumes a common response across units.
- `pool=mg`: Estimates the LP separately for each unit, then averages  $\beta_h$  across units (Pesaran-Smith mean-group estimator). Appropriate when responses are heterogeneous across units.

## 4.4 Standard errors

- `se=dk` (default): Driscoll-Kraay (1998). Aggregates residual scores by calendar period and applies a Bartlett HAC kernel over time, giving SEs that are robust to heteroskedasticity, autocorrelation, and cross-sectional dependence. The bandwidth defaults to the Newey-West rule  $\lfloor 4(T/100)^{2/9} \rfloor$ .
- `se=cluster`: Clusters residuals by cross-section unit. Handles within-unit serial correlation from the overlapping  $h$ -step horizon but ignores cross-sectional dependence.

# 5 Outputs

All objects are created in the active workfile page. Intermediate working matrices are deleted automatically.

Object	Type	Description
<code>lpiv_results</code>	Matrix	$H + 1 \times 7$ matrix. Columns: <code>h</code> , <code>beta</code> , <code>se</code> , <code>t-stat</code> , <code>lower95</code> , <code>upper95</code> , <code>1stStageF</code> .
<code>lpiv_table</code>	Table	Formatted version of <code>lpiv_results</code> with column headers.
<code>lpiv_irf</code>	Graph	IRF line graph: lower 95%, upper 95%, LP-IV point estimate.

# 6 Examples

## 6.1 Simulated validation

The following replicates the add-in's validation against a simulated panel ( $N = 30$  units,  $T = 300$  periods) with a known hump-shaped true IRF peaking at  $h = 3$ :

```
' Import and structure panel_lpiv_sim.csv as a dated panel
' (firm = cross-section, year = date)
panellpiv(resp="y", imp="x", inst="z", ctrl="", lags=0,
          hor=12, pool=fe, se=dk, bw=0)
```

Expected output:  $\beta_3 \approx 1.130$  with first-stage  $F > 8000$ . Point estimates match the independent Python reference estimator to six decimal places.

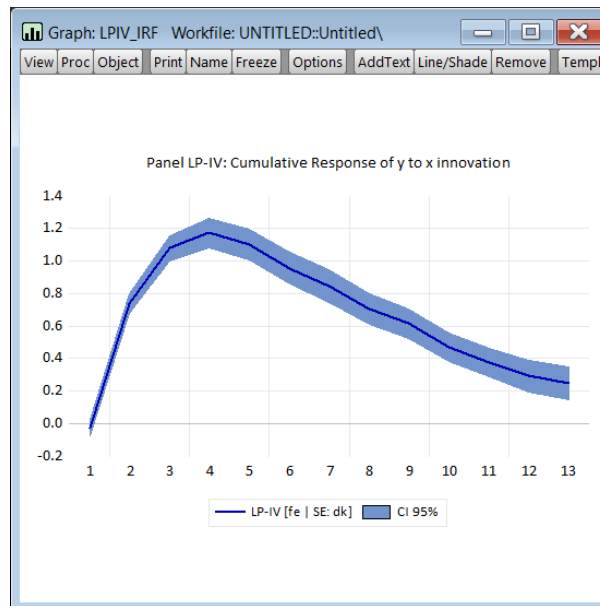


Figure 2: LP-IV Response for simulated data

## 6.2 Real-data application (JST Macrohistory Database)

Replication of Jordà, Schularick, and Taylor (2015) "Betting the House". This estimates the cumulative response of real house prices (hpy) to a short-term interest rate shock (dstir), instrumented by the trilemma IV (raw\_instrument) with robust clustered standard errors:

```
panellpiv(resp="hpy", imp="dstir", inst="raw_instrument",
          ctrl="dltrate dmortY dly diy dnmortY dcpi caY",
          lags=2, hor=4, pool=fe, se=cluster, cumul)
```

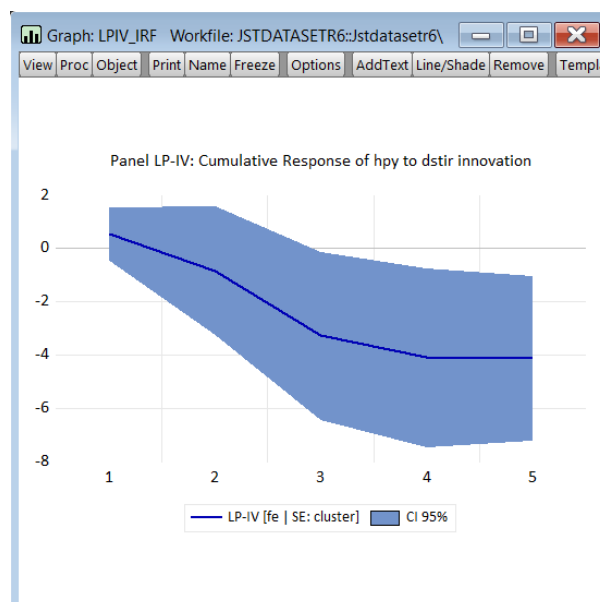


Figure 3: LP-IV response for an exogenous shock to the short-term interest rate

## 7 References

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