# Do Falling Housing Prices Influence Labor-Market Slack?
## Evidence from the Household Side

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# Research Question & Positioning

- **Context:** China's 2021 housing-market correction created large negative housing wealth shocks.

- **Research Question:** Do falling housing prices influence labor-market slack through household labor-supply responses?

- **Mechanism:** Housing-price declines tighten household liquidity/debt constraints, potentially affecting employment and work hours.

- **Positioning:**
  - Adds a household-supply-side channel to a literature largely focused on demand-side effects.
  - Links macro housing shocks to micro labor decisions using merged CFPS–city panel.

# Methodology: Data & Variables

- **Household data:** China Family Panel Studies (CFPS, 2010–2022), including employment, income, debt, housing ownership, and demographic characteristics.

- **City-level data:**
  - Constructed panel of over 300 prefecture-level cities, 2010–2022.
  - *Housing prices* from the *China Real Estate Index System (CREIS).*
  - *Vacancy* from the *Zhilian* hiring platform dataset.
  - *GDP per capita, urbanization, real estate investment, and population density* from official *provincial and municipal Statistical Yearbooks.*

- **Key variables:**
  - $y_{ict}$: employment indicator (1 = employed), workhours (weekly).
  - $\ln P_{ct}$: log city-level housing price.
  - DebtRatio$_{i,pre}$: pre-shock debt-to-income ratio.
  - Slack$_{ct}$ : $U/V$, the inverse of market tightness (more unemployed workers per vacancy).
  - Tightness$_{ct}$ : $V/U$, standard measure of labor-market tightness.
  - Labor Force$_{ct}$ : $E + U$, total number of employed and unemployed workers.

**Model Design**

**Macro First-stage specification:**

$$\Delta \ln P_{ct} = \alpha + \beta_1 IV_{ct} + \lambda_c + \lambda_t + \varepsilon_{ct}$$

**Instrument:**

$$IV_{ct} = (\text{National housing price downturn}_t) \times \left( \frac{\text{Average real estate investment}_{c,2015–2019}}{\text{Average GDP}_{c,2015–2019}} \right)$$

**Second Stage:**

$$\Delta y_{ct} = \beta_1 \widehat{\Delta \ln P_{ct}} + \lambda_c + \lambda_t + \varepsilon_{ct}$$

**Micro Baseline regression:**

$$y_{ict} = \beta_1 \widehat{\Delta \ln P_{ct}} + \mathbf{X}'_{ict}\delta + \lambda_c + \lambda_t + \varepsilon_{ict}$$

**Micro Heterogeneity by household debt:**

$$y_{ict} = \beta_1 \widehat{\Delta \ln P_{ct}} + \beta_2(\widehat{\Delta \ln P_{ct}} \times \text{DebtRatio}_{i,pre}) + \beta_3 \text{DebtRatio}_{i,pre} + \mathbf{X}'_{ict}\delta + \lambda_c + \lambda_t + \varepsilon_{ict}$$

# Macro Results: City-Level Responses

- **First stage strong:** F = 18.6; instrument predicts price declines.

- **First stage** significant on Labor force **Labor force increases** as prices fall; But housing price declines did not increase overall unemployment unemployment, slack, or tightness.

- **Sectoral reallocation:**
  - Secondary sector (Manufacturing & Construction) employment share declines when housing price growth slows, while Primary(Agriculture & Mining) and Tertiary sector(service) employment expand.
  - Housing price declines triggered a clear **sectoral reallocation of labor** ⇒ away from construction-related industries and toward manufacturing industries (structural adjustment rather than aggregate job loss.)

**Table 1. Effects of Housing Price Declines on Employment (2SLS)**

|  | $\Delta \ln P_{ct}$ | Labor force |
|---|---|---|
| **Panel A: First Stage** | | |
| $IV_{ct}$ | -2.51*** | |
|  | (0.58) | |
| F-statistic | 18.58 | |
| **Panel B: Second Stage** | | |
| $\widehat{\Delta \ln P_{ct}}$ | | 201.62*** |
|  | | (95.39) |
| City FE | Yes | |
| Year FE | Yes | |
| *Observations* | 3,346 | 2,339 |
| *Clusters (city)* | 292 | 285 |

*Notes:* *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses and clustered at the city level.

**Table 2. Effects of Housing Price Declines on Industrial Employment Shares (2SLS)**

|  | $\Delta \ln P_{ct}$ | Primary | Secondary | Tertiary |
|---|---|---|---|---|
| **Panel A: First Stage** | | | | |
| $IV_{ct}$ | -2.51*** | | | |
|  | (0.58) | | | |
| F-statistic | 18.58 | | | |
| **Panel B: Second Stage** | | | | |
| $\widehat{\Delta \ln P_{ct}}$ | | -11.81*** | 40.81*** | -25.82*** |
|  | | (5.72) | (14.02) | (12.12) |
| City FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| *Observations* | 3,346 | 2,406 | 2,462 | 2,460 |
| *Clusters (city)* | 292 | 284 | 286 | 286 |

*Notes:* *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses and clustered at the city level.

**Table 3. Effects of Housing Price Declines on Sectoral Employment Shares (2SLS)**

|  | $\Delta \ln P_{ct}$ | Construction | Real Estate | Manufacturing |
|---|---|---|---|---|
| **Panel A: First Stage** | | | | |
| $IV_{ct}$ | -2.51*** | | | |
|  | (0.58) | | | |
| F-statistic | 18.58 | | | |
| **Panel B: Second Stage** | | | | |
| $\widehat{\Delta \ln P_{ct}}$ | | 0.221*** | -0.022 | 0.196*** |
|  | | (0.081) | (0.014) | (0.097) |
| City FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| *Observations* | 3,346 | 2,460 | 2,459 | 2,460 |
| *Clusters (city)* | 292 | 286 | 286 | 286 |

*Notes:* *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses and clustered at the city level.

# Micro Results: Baseline & Debt Heterogeneity

- Housing-price declines have no strong average effects on the baseline employment or weekly work hours.

  **Household debt amplifies labor responses to housing shocks:**

- **Employment:** high-debt households show significantly larger declines in employment when housing prices fall.

- **Workhours:** households with higher debt-to-income ratios increase weekly work hours more when prices decline.

**Interpretation:** evidence consistent with a liquidity-constraint / debt-overhang mechanism operating on both margins.

**Table 3.Employment Heterogeneity by Household Debt**

| | $\text{Employed}_{ict}$ | |
|---|---|---|
| $\widehat{\Delta \ln P_{ct}}$ | -1.07*** | -0.90** |
| | (0.36) | (0.44) |
| DebtRatio$_{i,pre}$ | -0.00 | |
| | (0.00) | |
| DebtHigh$_{i,pre}$ | | 0.03 |
| | | (0.02) |
| $\widehat{\Delta \ln P_{ct}} \times$ DebtRatio$_{i,pre}$ | -0.14*** | |
| | (0.02) | |
| $\widehat{\Delta \ln P_{ct}} \times$ DebtHigh$_{i,pre}$ | | -2.05** |
| | | (1.00) |
| City FE | Yes | Yes |
| Year FE | Yes | Yes |
| City-specific trend | Yes | Yes |
| *Observations* | 1,431 | 1,431 |

*Notes:* *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses, clustered at the city level.

# Workhours Heterogeneity

**Table 4. Workhour Heterogeneity by Household Debt**

|  | Workhours$_{ict}$ | |
| --- | --- | --- |
| $\widehat{\Delta \ln P_{ct}}$ | 79.36 | 50.60 |
|  | (53.43) | (61.46) |
| DebtRatio$_{i,pre}$ | -0.02 |  |
|  | (1.11) |  |
| DebtHigh$_{i,pre}$ |  | -2.63 |
|  |  | (2.29) |
| $\widehat{\Delta \ln P_{ct}} \times$ DebtRatio$_{i,pre}$ | -21.17** |  |
|  | (8.70) |  |
| $\widehat{\Delta \ln P_{ct}} \times$ DebtHigh$_{i,pre}$ |  | -47.46 |
|  |  | (91.37) |
| City FE | Yes | Yes |
| Year FE | Yes | Yes |
| Individual controls | Yes | Yes |
| *Observations* | 831 | 831 |

*Notes:* *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses, clustered at the city level.

# Implications & Limitations

**Implications**

- Housing downturns reshape labor allocation across sectors rather than raising measured slack.
- Household debt plays a key role in mediating labor-supply adjustments.

**Limitations**

- Only one post-2021 CFPS wave; limited dynamic analysis.
- Slack measurement coarse: city unemployment not public; vacancy data from single platform.
- Exposure varies across households despite city FE (homeownership, migration, within-city variation).
- CFPS lacks search intensity or reservation wage measures.