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

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Abstract

China's recent housing-market downturn has generated sizable wealth shocks, raising concerns about labor-market impacts. Using a merged city–household panel from 2010–2022 and an instrument based on national housing-price downturns interacted with cities' pre-2019 real-estate exposure ($F = 18.6$), this study examines how declining housing prices affect labor-market slack. At the macro level, predicted housing-price declines do not increase unemployment or slack but reduce the labor force and shift employment away from secondary industries. At the micro level, average employment and work hours show limited responses overall, but debt heterogeneity is significant. Leveraged households react strongly: for each one-unit decline in predicted housing-price growth, highly indebted households are 14 percentage points more likely to adjust employment than low-debt households. Work-hour responses are even larger, for high-debt households, a one-unit decline corresponds to roughly 387 additional minutes of work per week (about 6.5 hours). These findings indicate that housing-wealth losses primarily affect financially constrained households.

1 Introduction

Labor-market slack, which reflects the extent of underutilized labor resources, has drawn renewed attention as China undergoes a substantial housing-market correction. Since 2021, housing prices have declined sharply after the introduction of the "Three Red Lines" regulatory framework, which imposed strict leverage limits on real-estate developers and precipitated a broad contraction in financing and investment. These developments generated sizable negative wealth shocks for urban households and raised important questions about how balance-sheet deterioration may affect labor-market activity. Classic macroeconomic models suggest that housing is both a consumption good and a key collateral asset, meaning that falling home values can tighten liquidity constraints and aggravate households' financial stress (Kiyotaki and Moore, 1997; Iacoviello, 2005). At the same time, China's economic transition has deepened household reliance on housing wealth, exposing labor decisions to fluctuations in real estate markets. The impact may be even stronger in China's predominantly full-recourse mortgage system, where mortgage borrowers generally remain liable for any shortfall after collateral liquidation, amplifying balance-sheet stress when housing prices fall (Gelpern et al., 2023). These developments prompt a central question: whether declining housing prices contribute to rising labor-market slack by influencing household labor-supply behavior. Addressing this question is essential for understanding the labor-market implications of China's ongoing demographic and macroeconomic challenges.

Existing research on housing markets has largely emphasized demand-side channels, documenting the effects of housing booms and busts on construction activity, investment cycles, and local labor demand (Zabel, 2012; Liu et al., 2019) . Although this literature provides important insights, the household supply-side channel remains less understood. Falling housing prices may affect workers' employment decisions, search intensity, and working hours through income and collateral effects (Goetz, 2013; Ernst and Saliba, 2018) , yet empirical evidence on these mechanisms in developing or transitional economies remains limited. Preliminary work suggests that negative housing wealth shocks can induce households with significant

leverage to increase labor supply in an effort to stabilize consumption or meet debt obligations (Philippon and Midrigan, 2011; Andrés et al., 2013) , but it is unclear whether such micro adjustments translate into changes in aggregate labor-market slack. Thus, further research is needed to examine how housing-market fluctuations shape both macro-level slack and micro-level employment outcomes.

To fill this gap, this study investigates how declines in housing prices affect both city-level labor market slack and household-level labor responses in China. Using a newly constructed city panel from 2010 to 2022 combined with repeated cross-sections from the China Family Panel Studies (CFPS), this paper evaluates the causal effects of housing-price shocks on city unemployment, vacancies, labor force size, tightness, and individual employment probabilities and working hours. The analysis focuses on three mechanisms motivated by existing theoretical frameworks. First, falling housing prices may influence labor demand by reducing job creation and shifting employment away from real-estate–related industries(Farber, 2012; Saks, 2008; Osei and Winters, 2019). Second, households with substantial mortgage or debt burdens may adjust labor supply upward—either by increasing employment or by working longer hours—to ease liquidity pressure or meet debt obligations(Philippon and Midrigan, 2011; Andrés et al., 2013). Third, weaker labor-force attachment may arise from migration or registration adjustments, contributing to changes in measured labor force size rather than unemployment rates (Fields, 1976; Abraham and Shimer, 2001).

This study contributes to the literature in several ways. First, it provides one of the earliest empirical assessments of how China's recent housing downturn has affected labor-market slack and employment structure across cities, offering evidence relevant for macroeconomic stabilization and labor-market policy. Second, it incorporates both macro and micro perspectives by linking city-level housing-price shocks to household labor outcomes. Third, it identifies household debt as a key heterogeneity dimension: highly leveraged households adjust labor supply far more strongly than low-debt households, consistent with a balance-sheet or liquidity-stress mechanism. Finally, this study enriches understanding of labor-market dy-

namics in developing and transitional economies, where housing wealth constitutes a large share of household portfolios and financial constraints can amplify labor market responses to asset-price changes.

By integrating city-level measures of slack with household-level labor responses, this study sheds light on the complex interactions between housing-market fluctuations and labor-market conditions. The findings reveal that housing-price declines reshape labor-market outcomes primarily through adjustments in labor force size, sectoral composition, and the labor supply of financially constrained households, rather than through broad increases in unemployment or aggregate slack. These results generate implications for labor-market resilience, debt policy, and macroeconomic management in highly leveraged economies.

2 Literature Review

2.1 Sources and Theoretical Explanations Linking Housing Markets to Labor Outcomes

A large body of research documents that housing markets shape labor-market outcomes through several macroeconomic and household-level mechanisms(Dauth et al., 2024; Jansen, 2025). First, housing wealth plays a dual role as both a consumption asset and collateralizable wealth. Classic models show that declines in home values tighten collateral constraints, reduce borrowing capacity, and weaken households' balance-sheet positions, which may, in turn, affect labor supply, job-search behavior, and employment stability (Bernstein, 2017; Kabaş and Roszbach, 2022).

Second, from a labor-demand perspective, housing cycles influence local economic activity, particularly in sectors tied to real estate and construction(Davis and Heathcote, 2005; Maennig, 2016). Downturns can reduce job creation and vacancies, increase job separations, and shift the composition of employment across industries, thereby altering local labor-market tightness Glaeser et al. (2008); Charles et al. (2018). Third, migration and population dynamics also respond to housing cycles (Monnet and Wolf, 2017; Edelstein and Tsang, 2007). When local housing markets weaken, population outflows or delayed in-migration may occur, directly affecting the size of the labor force and contributing to changes in measured slack (Hashimoto et al., 2020; Andrews et al., 2011). There are also evidence showing that increasing the level and volatility of real house prices may prevent people from moving easily to follow employment opportunities(Andrews et al., 2011).

Furthermore, previous studies suggest that housing-market fluctuations may reinforce structural divisions across sectors. For example, construction and manufacturing employment is highly sensitive to real-estate booms and busts, whereas service-sector employment tends to be more stable. Such segmentation shapes how housing shocks propagate into the labor market and may lead to persistent heterogeneity across cities depending on their in-

dustrial composition (Ouazad, 2020; Moretti, 2010). Previous research provides evidence that unemployment is due to housing, since housing is durable, the increased demand causes a surge of new houses and construction jobs(Howard, 2020). These theoretical perspectives collectively imply that local labor-market slack could respond to housing downturns through both demand-side adjustments and shifts in population or industry structure (Charles et al., 2019; Howard, 2020).

2.2 Housing Wealth, Liquidity Constraints, and Household Labor Supply

A separate literature focuses on the micro-level labor-supply responses to changes in housing wealth. Negative housing-wealth shocks can tighten liquidity and debt constraints, particularly for households with mortgages or high leverage (Ganong and Noel, 2020; Senner and Sornette, 2018; Manou et al., 2021). Several studies show that financially constrained households respond to adverse wealth shocks by increasing labor supply, working additional hours, delaying retirement, or intensifying job search to stabilize consumption (Amromin et al., 2017; Arestis et al., 2021). This mechanism is consistent with a "debt-overhang" or "liquidity-stress" channel in which declines in home equity raise the marginal value of extra earnings (Donaldson et al., 2019; Dynan et al., 2012).

However, these effects are not uniform across households. Borrowers, low-income households, and households with large mortgage burdens are most sensitive to housing downturns, while households without debt may exhibit little labor-supply response (Bernstein, 2017). Additionally, some strands of literature highlight potential negative effects on employment: wealth losses may reduce geographic mobility, worsen match quality, or increase job insecurity, potentially raising unemployment risks for certain groups, Homeowners with both negative equity and economic shocks were much more likely to have moved over the Great Recession and to have moved involuntarily. (Bricker and Bucks, 2016). These mixed empirical findings underscore the importance of studying heterogeneity by household debt or

balance-sheet exposure.

2.3 Mechanisms and Hypotheses

The literature points to three potential channels through which housing-price declines may shape labor-market slack. The first concerns labor-force adjustments: weaker housing conditions may discourage participation, affect registration decisions, or shift migration patterns. The second channel involves sectoral reallocation, as employment may move away from construction- and real-estate-related industries during housing downturns. The third channel relates to household balance-sheet conditions: households with tighter liquidity or higher debt ratios may increase labor supply in response to adverse housing-wealth shocks.

3 Method

3.1 Data and Measures

This study combines city-level labor-market indicators with household-level microdata to examine how housing-price declines shape both aggregate labor-market conditions and individual labor-supply responses in China. The primary micro dataset is the China Family Panel Studies (CFPS), a nationally representative longitudinal survey covering demographics, employment, income, debt, and housing characteristics of households from 2010 to 2022.

At the macro level, a prefecture-level panel is constructed for more than 300 cities using multiple official and commercial data sources. Housing prices are obtained from the China Real Estate Index System (CREIS). Vacancy measures come from the Zhilian recruitment platform. GDP per capita, real-estate investment ratios, and population density are drawn from provincial and municipal Statistical Yearbooks. For the household analysis, the sample is restricted to working-age individuals between ages 18 and 60, excluding those enrolled in school, retired, or reporting disabilities that prevent labor-market participation.

The dependent variables differ across the macro and micro components of the analysis.

At the macro city level, the primary outcomes include labor-market slack—measured as the ratio of registered unemployment to job vacancies—the size of the labor force, and the shares of employment across industrial sectors. These indicators capture both the overall tightness of local labor markets and the compositional adjustments that may accompany housing-market fluctuations.

The key independent variable is the change in the log city-level housing price, derived from CREIS data. Housing-price declines constitute the primary source of variation, and the empirical strategy uses an external instrument to address endogeneity arising from local economic conditions or reverse causality. The instrument interacts national housing-price downturns with each city's pre-determined exposure to real-estate investment, measured by the ratio of average real-estate investment to average GDP during 2015–2019 (Graham and Makridis, 2023). The macro analysis includes city fixed effects and year fixed effects, consistent with standard shift-share identification designs, and does not incorporate additional time-varying controls. This specification isolates plausibly exogenous variation in housing-price changes while accounting for unobserved city characteristics and national shocks.

At the micro household level, the dependent variables are employment status, weekly working hours, and an indicator for whether an individual engages in self-employment or private business activity. The key independent variable is the predicted change in city-level housing prices from the macro estimation. The micro analysis controls for individual and household characteristics commonly associated with labor-market outcomes, including age, education, gender, and marital status (Bertola et al., 2007; Deseran et al., 2019). These covariates help account for baseline differences in human capital and demographic factors that may influence employment decisions. Because household balance-sheet conditions are a central channel through which housing-wealth shocks may influence labor decisions, the analysis incorporates measures of household pre-downturn debt and debt-to-income ratios. These variables are used in the heterogeneity analysis to assess whether financially constrained households respond more strongly to declining housing prices. City and year fixed

effects further account for unobserved structural differences and national trends over time.

Table 1 provides formal definitions and mean values of all variables used in the analysis.

Table 1: Variable Definitions

Variables	Definition	Mean
Panel A: Macro City Level		
Dependent Variables		
Labor force	Employed + unemployed workers (thousands)	1004.67
Slack (U/V)	Unemployment-to-vacancy ratio	597.63
Tightness (V/U)	Vacancy-to-unemployment ratio	1.25
Unemployment Rate	Registered city unemployment rate	0.06
Primary Industrial Share	Growth rate of primary-sector employment share	-0.06
Secondary Industrial Share	Growth rate of secondary-sector employment share	-0.63
Tertiary Industrial Share	Growth rate of tertiary-sector employment share	0.69
Independent Variables		
$\Delta \ln P_{city}$	Change in log city-level housing price	0.027
Panel B: Micro Household Level		
Dependent Variables		
Employment status	1 = employed; 0 = not employed	0.532
Weekly working hours	Hours worked per week	48.01
Independent Variables		
Predicted $\Delta \ln P_{city}$	Predicted city-level housing-price change	0.046
Control Variables		
Age	Age of respondent	45.20
Education	Years of schooling	8.44
Male	1 = male; 0 = female	0.57
Married	1 = married; 0 = else	0.91
Household income	Household income, last 12 months (¥)	73376.61
Debt ratio	Debt-to-income ratio (pre-downturn)	3.09
Housing Debt ratio	Housing debt-to-income ratio (pre-downturn)	3.16
Non-Housing Debt ratio	Non-housing debt-to-income ratio (pre-downturn)	2.17
Mortgage ratio	Mortgage-to-income ratio (pre-downturn)	2.86
Debt_High	1 = highest-debt tercile; 0 = otherwise	0.03

3.2 Analyses

To gain further insights into the relationship between housing-price changes and labor-market outcomes, the analysis proceeds in two stages: a macro city-level instrumental variables strategy that recovers exogenous variation in housing-price changes, followed by micro household-level regressions that examine individual labor responses.

3.2.1 Macro-Level Instrumental Variables Strategy

At the macro level, the study adopts a two-stage least squares (2SLS) framework to address potential endogeneity in housing-price movements. Local housing prices may respond to changes in labor-market conditions, raising concerns about reverse causality. To mitigate this issue, the analysis uses an external instrument that interacts national housing-price downturns with each city's pre-determined exposure to real-estate investment. Cities that allocated a larger share of GDP to real-estate investment before the downturn experienced stronger predicted housing-price declines when national conditions deteriorated.

The first-stage specification is:

$$\Delta \ln P_{ct} = \alpha + \beta_1 IV_{ct} + \lambda_c + \lambda_t + \varepsilon_{ct}, \tag{1}$$

where the instrument is defined as:

$$IV_{ct} = \text{National Housing-Price Downturn}_t \times \left(\frac{\text{Avg. Real Estate Investment}_{c,pre}}{\text{Avg. GDP}_{c,pre}} \right). \tag{2}$$

Here, $\Delta \ln P_{ct}$ denotes the log change in housing prices, and IV_{ct} captures a city's exposure to national housing-market declines, based on its 2015–2019 average real-estate investment relative to GDP. The coefficient β_1 measures the predictive power of the instrument.

The second-stage equation uses the predicted housing-price changes from the first stage:

$$y_{ct} = \gamma \widehat{\Delta \ln P}_{ct} + \lambda_c + \lambda_t + \eta_{ct}, \tag{3}$$

where y_{ct} includes city-level outcomes such as labor force, slack, unemployment rate, tightness, and industrial employment shares. This design isolates plausibly exogenous variation in housing-price changes and enables analysis of their macro-level labor-market effects.

3.2.2 Micro-Level Household Regressions

At the micro level, the study examines how individuals adjust their labor supply in response to predicted housing-price changes. The baseline household regression is:

$$y_{ict} = \beta_1 \widehat{\Delta \ln P}_{ct} + X_{ict}\delta + \lambda_c + \lambda_t + \varepsilon_{ict}, \tag{4}$$

where y_{ict} represents employment status, weekly working hours, or self-employment. The vector X_{ict} includes demographic and socioeconomic controls such as age, education, marital status, gender, and health status. This specification identifies average household labor-supply responses to housing-price fluctuations.

To examine heterogeneity driven by household debt conditions, an interaction model is estimated:

$$\begin{aligned} y_{ict} = {} & \beta_1 \widehat{\Delta \ln P}_{ct} + \beta_2 \left(\widehat{\Delta \ln P}_{ct} \times \text{DebtRatio}_{i,pre} \right) + \beta_3 \, \text{DebtRatio}_{i,pre} \\ & + X_{ict}\delta + \lambda_c + \lambda_t + \varepsilon_{ict}, \end{aligned} \tag{5}$$

where debt measures include the total household debt-to-income ratio, the housing and non-housing debt ratios, the mortgage-to-income ratio, and tercile indicators for the total debt-to-income distribution. This model evaluates whether households with higher debt burdens or housing-related liabilities respond more strongly to declines in housing prices, consistent with theories suggesting that financially constrained households face stronger incentives to increase labor supply when housing wealth falls.

Taken together, the macro and micro analyses provide a unified framework for understanding how housing-market downturns shape both aggregate labor-market conditions and household labor responses.

4 Results

4.1 City-level impact of housing-price declines on labor-market outcomes

Table 2 reports the macro-level 2SLS estimation results using predicted housing-price changes as the main explanatory variable. Across specifications, the results indicate that housing-price declines do not lead to a statistically significant increase in aggregate labor-market slack ($\beta = 410643.6$, $p > 0.1$). The unemployment rate also shows no systematic response ($\beta = 0.25$, $p > 0.1$), suggesting that overall labor-market imbalances are not directly affected by falling housing prices, which is consistent with previous literature(Mian and Sufi, 2014; Ernst and Saliba, 2018).

In contrast, the labor-force estimates are positive and statistically significant ($\beta = 201.62$, $p < 0.01$), indicating that when housing prices decline, the size of the labor force falls correspondingly. This pattern is consistent with population outflows, weaker formal labor-force registration, or discouraged-worker effects documented in housing-downturn contexts, and also consistent with the findings from other researchers(Johnes and Hyclak, 1999).

Tightness, measured as the vacancy-to-unemployment ratio, shows a statistically significant negative response ($\beta = -49.8$, $p < 0.01$). Although this sign appears counterintuitive, since lower housing prices typically reduce labor demand, this negative coefficient likely reflects sharper declines in vacancies relative to registered unemployment, consistent with vacancy-driven tightening documented in downturn periods (Lee, 2016).

Table 2: Effects of Housing Price Declines on Employment (2SLS)

	$\Delta \ln P_{ct}$	Labor force	Slack	Unemployment	Tightness
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***	410643.6	0.25	-49.8***	
	(95.39)	(422051)	(0.17)	(16.65)	
City FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	3,346	2,339	1,532	3,346	1,572
Clusters (city)	292	285	292	292	292

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

To supplement, Table 3 shows that the estimates have a clear pattern of sectoral reallocation. Consistent with the real-estate-driven nature of the downturn, primary sector employment share decreases significantly in response to falling housing prices ($\beta = -11.81$, $p < 0.05$), while secondary-sector employment share exhibits a strong positive response ($\beta = 40.81$, $p < 0.01$). Tertiary-sector employment also declines moderately and significantly ($\beta = -25.82$, $p < 0.05$). These findings suggest that housing-market distress primarily affects the composition of employment rather than the aggregate labor supply or unemployment rate, which is similar to the findings in previous literature(Kishor et al., 2022; Zhang and Liu, 2024; Case and Mayer, 1996).

Table 3: Effects of Housing Price Declines on Industrial Employment Shares (2SLS)

VARIABLES	$\Delta \ln P_{ct}$	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.

Overall, the macro-level evidence indicates that housing-price declines reshape local labor markets primarily through structural adjustments across industries, rather than through the overall increases in slack or unemployment. While labor force size does respond significantly to housing-price declines, the main adjustment margin appears to lie in sectoral composition. Generally, as housing prices fall, a clear cross-sector employment reallocation emerges.

4.2 Household-level impact of housing-price changes household labor behaviors

To further explore the underlying mechanisms through which housing-price declines influence household labor-market behavior, the analysis next examines heterogeneity by households' financial conditions. Specifically, households are divided according to their pre-downturn debt ratios, reflecting differences in balance-sheet vulnerability. Before estimation, the micro regressions use the instrumented city-level housing-price change obtained from the macro first-stage, ensuring that the variation in housing-price shocks is plausibly exogenous to individual labor-market decisions. This IV-generated measure provides a cleaner source of

identifying variation relative to raw price changes.

Three measures of household leverage are considered: the total debt-to-income ratio, housing debt-to-income ratio, and non-housing debt-to-income ratio. In addition, households are grouped into terciles of the total debt-to-income distribution, distinguishing low, medium, and high-debt households to reflect different leverage levels. These indicators capture financial exposure to negative housing-wealth shocks and have been widely applied in the literature on balance-sheet channels and labor-supply responses (Cho et al., 2019; Bernstein, 2017).

Table 4 presents the heterogeneity in employment responses to predicted housing-price declines. Column (1) reports the baseline specification without debt interactions and shows that the average effect of housing-price declines on employment is not statistically significant. As George emphasized, the key parameter of interest is not the main coefficient on $\widehat{\Delta \ln P_{ct}}$, but the interaction term that captures how responses differ across households with varying financial positions.

Column (2) introduces the total debt-to-income ratio and shows a strong and statistically significant interaction effect: the coefficient on $\widehat{\Delta \ln P_{ct}} \times \text{DebtRatio}_{i,pre}$ is negative and highly significant ($\beta = -0.14$, $p < 0.01$).

This indicates that as housing prices fall, households with higher overall leverage experience much larger increases in employment relative to low-debt households. The negative sign reflects that high-debt households react more strongly in the opposite direction of the main effect, consistent with a compensatory labor-supply adjustment.

Column (3) refines this pattern using terciles of the debt distribution. The interaction term for high-debt households is again large and statistically significant ($\beta = -2.05$, $p<0.05$), while the middle- and low-debt groups show no systematic employment response. This confirms that the employment adjustment is concentrated among the most financially constrained households.

Columns (4)–(6) repeat the analysis using housing debt, non-housing debt, and mort-

gage ratios. The interaction terms for housing-related leverage are negative and economically large, with statistical significance in the housing-debt specification. Align with past literature, Non-housing debt shows a weaker and statistically insignificant pattern, suggesting that obligations tied specifically to housing or mortgage liabilities are more relevant for labor-supply adjustments(Zator, 2025; Pizzinelli, 2018).

Across all specifications, the interaction coefficients serve as the key identifying parameters. They consistently indicate that employment responses to predicted housing-price declines vary largely by households' financial conditions. In the models where leverage is measured by total debt or debt terciles, the interaction terms are negative and statistically significant, implying that high-debt households adjust their employment more strongly than low-debt households when housing prices fall. In contrast, specifications based on non-housing debt or mortgage ratios show weaker and statistically insignificant interaction effects, suggesting that not all forms of debt generate the same labor-supply sensitivity, which is consistent to the evidence from other study (Bernstein, 2016).

Taken together, the results indicate that the heterogeneity in employment responses is driven primarily by households with substantial pre-downturn leverage, particularly those with higher overall or housing-related debt burdens. Low-debt households exhibit minimal or no systematic adjustment. This pattern aligns with a balance-sheet channel: when housing wealth deteriorates, financially constrained households face stronger pressure to adjust their labor-market behavior, whereas financially resilient households remain largely unaffected.

Table 4: Employment heterogeneity by household debt

	Employed$_{ict}$					
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{\Delta \ln P_{ct}}$	2.55	-1.07***	-0.90**	2.24**	2.87**	2.42**
	(1.12)	(0.36)	(0.44)	(1.08)	(1.12)	(1.01)
DebtRatio$_{i,pre}$		0.00				
		(0.00)				
$\widehat{\Delta \ln P_{ct}}$ × DebtRatio$_{i,pre}$		-0.14***				
		(0.02)				
DebtHigh$_{i,pre}$			0.03			
			(0.02)			
$\widehat{\Delta \ln P_{ct}}$ × DebtHigh$_{i,pre}$			-2.05**			
			(1.00)			
Housing Debt ratio$_{i,pre}$				0.16		
				(0.31)		
$\widehat{\Delta \ln P_{ct}}$ × Housing Debt ratio$_{i,pre}$				-5.50		
				(0.31)		
NonHousing Debt ratio$_{i,pre}$					0.01	
					(0.01)	
$\widehat{\Delta \ln P_{ct}}$ × NonHousing Debt ratio$_{i,pre}$					-0.90	
					(0.76)	
Mortgage ratio$_{i,pre}$						0.00
						(0.00)
$\widehat{\Delta \ln P_{ct}}$ × Mortgage ratio$_{i,pre}$						-0.00
						(0.03)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
X_{ict}	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2693	1431	1431	4885	4984	4866

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

Table 5 examines heterogeneity in weekly working hours using the same set of debt measures. Column (1) presents the baseline specification without debt interactions. The coefficient on $\widehat{\Delta \ln P_{ct}}$ is negative but insignificant ($\beta = -82.75$, p> 0.10), indicating that the predicted housing-price declines are not associated with a statistically significant change in weekly work hours. As in the employment results, Columns (2)–(6) reveal substantial heterogeneity across households with different leverage levels.

In Column (2), the interaction between predicted housing-price declines and the total debt-to-income ratio is large, negative, and highly significant ($\beta = -28.69$, p< 0.01). Given that the main effect of $\widehat{\Delta \ln P_{ct}}$ for low-debt households is not statistically different from zero ($\beta = 102.28$, p> 0.10), this negative interaction implies that weekly work hours decrease little for households with low leverage but increase sharply as pre-downturn debt rises. In other words, high-debt households are more likely to work when housing prices fall.

Column (3) confirms this pattern using terciles of the total debt-to-income distribution. The interaction term for high-debt households, $\widehat{\Delta \ln P_{ct}} \times \text{DebtHigh}_{i,pre}$, is strongly negative and highly significant ($\beta = -387.06$, p< 0.01), while the corresponding coefficients for the low- and middle-debt groups are small and statistically insignificant. This indicates that increases in weekly work hours in response to housing-price declines are concentrated in the highest-debt tercile, similar to previous evidence(Schwartzman and Yang, 2020).

Columns (4)–(6) decompose leverage into housing, non-housing, and mortgage debt ratios. In Column (4), the interaction between predicted housing-price declines and the housing debt-to-income ratio, $\widehat{\Delta \ln P_{ct}} \times \text{Housing Debt ratio}_{i,pre}$, is again large and statistically significant ($\beta = -1038.92$, p< 0.05), suggesting that housing-related liabilities are particularly important in amplifying hours responses. By contrast, the interaction with the non-housing debt ratio in Column (5) and the mortgage-ratio interactionis in Column (6) are statistically insignificant ($\beta = 2.49$, p> 0.10; $\beta = -1.07$, p> 0.10). These estimates imply that non-housing debts and mortgage balances on their own do not generate clearly detectable additional variation in hours beyond what is already captured by total or housing-related

leverage.

Taken together, the interaction coefficients in Table 5 show that increases in weekly work hours following housing-price declines are primarily driven by households with substantial pre-downturn leverage, especially those with high overall or housing-related debt ratios. Consistent with previous studies, financially constrained households respond to negative housing-wealth shocks by working more hours, whereas households with lighter balance-sheet burdens exhibit little systematic change in labor effortMishkin (1978).

Table 5: Workhours per week heterogeneity by household debt

	Workhours$_{ict}$					
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{\Delta \ln P_{ct}}$	-82.75	102.28	-58.62	-100.48*	-92.40	-75.15
	(52.69)	(125.49)	(55.11)	(56.24)	(59.60)	(54.92)
DebtRatio$_{i,pre}$		1.56*				
		(0.79)				
$\widehat{\Delta \ln P_{ct}}$ × DebtRatio$_{i,pre}$		-28.69***				
		(9.31)				
DebtHigh$_{i,pre}$			17.41***			
			(5.38)			
$\widehat{\Delta \ln P_{ct}}$ × DebtHigh$_{i,pre}$			-387.06***			
			(106.31)			
Housing Debt ratio$_{i,pre}$				31.47**		
				(14.27)		
$\widehat{\Delta \ln P_{ct}}$ × Housing Debt ratio$_{i,pre}$				-1038.92**		
				(420.44)		
NonHousing Debt ratio$_{i,pre}$					0.08	
					(0.27)	
$\widehat{\Delta \ln P_{ct}}$ × NonHousing Debt ratio$_{i,pre}$					2.49	
					(6.32)	
Mortgage ratio$_{i,pre}$						-0.22
						(0.11)
$\widehat{\Delta \ln P_{ct}}$ × Mortgage ratio$_{i,pre}$						-1.07
						(2.93)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
X_{ict}	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2693	292	2693	2633	2690	2616

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

5 Conclusions and Policy Implications

This study provides new evidence on how China's recent housing-market downturn shapes labor-market outcomes at both the city and household levels. While aggregate labor-market slack and unemployment rates do not exhibit statistically significant increases in response to housing-price declines, the results reveal meaningful adjustments along several margins. At the city level, falling housing prices reduce the size of the local labor force and generate clear sectoral reallocation: employment shifts away from construction and secondary industries and toward tertiary activities. These patterns suggest that housing-market distress affects the composition of employment more than overall job availability, consistent with real-estate-driven local demand contractions. The negative and significant estimate for labor-market tightness further indicates that vacancy postings respond more strongly than unemployment registrations during downturns, a pattern that contrasts with standard slack dynamics but aligns with demand-side retrenchment in construction-related sectors.

At the micro level, average employment probabilities and work hours do not rise uniformly across households. Instead, the responses are highly heterogeneous. Households with higher pre-downturn debt burdens, particularly those carrying substantial housing-related liabilities, show significantly stronger increases in both employment and weekly working hours when housing prices fall. In contrast, low-debt households exhibit little systematic adjustment for labor supply. These results point to a prominent balance-sheet mechanism. Households with higher debt-to-income, especially housing debt and mortgage, tend to offset deteriorating housing wealth by supplying additional labor, whereas financially resilient households remain largely unaffected.

Taken together, the findings highlight the key role of financial vulnerability in amplifying the labor-market consequences of housing-market downturns. Housing-price declines do not uniformly depress labor demand or increase overall slack. Instead, they shape labor-market outcomes through heterogeneous household responses and sector-specific adjustments in employment composition.

From a policy perspective, several implications emerge. First, regions with high leverage may require targeted support during housing-market contractions, as households with heavy debt loads are more sensitive to wealth shocks and may increase labor supply in ways that obscure underlying financial strain. Second, stabilizing employment in construction-related industries. For example, through counter-cyclical public investment may mitigate the sectoral displacement observed in the data. Third, improving access to credit restructuring, temporary liquidity relief, or household debt-management programs could reduce the need for distress-driven labor-supply increases among highly leveraged households. Finally, relying solely on aggregate slack indicators risks underestimating localized or household-level labor-market stress; incorporating balance-sheet information into labor-market monitoring is increasingly important in a highly leveraged economy.

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