

Housing and labour dynamics

How do house prices affect unemployment?

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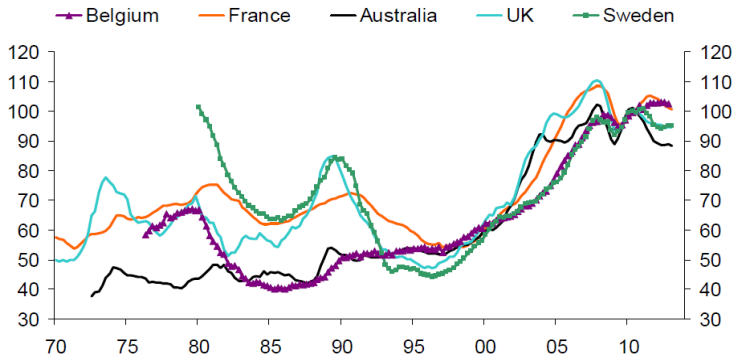
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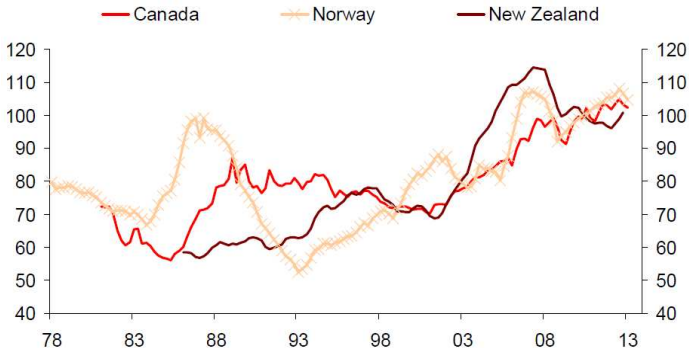
Recent housing price dynamics

Price-income ratios are above historical averages for many countries



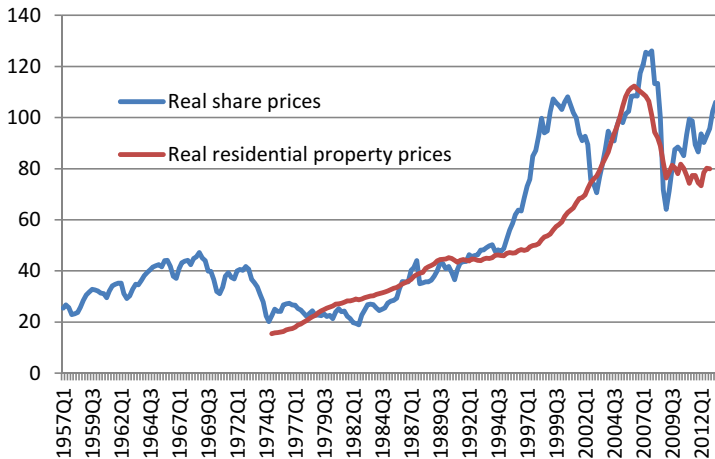
Recent housing price dynamics

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Comovement in housing and asset prices

House and asset prices show co-movement over the long-run in the US



Implication for labour markets (US)

What is the proper lag?



Overview

- 1 Modelling housing markets
 - Research strategy
 - What drives labour market dynamics?
- 2 Housing markets and macro-labour
 - Modelling and estimation strategy
 - A housing-augmented double Phillips curve
- 3 Estimation and model dynamics
 - Data and methodology
 - Estimating the labour flow macro-model
 - Model dynamics under shocks
- 4 Shock transmission under different policy settings
- 5 Concluding remarks

Transmission mechanisms of housing prices

Housing prices and the wealth effect

- ▶ Housing prices increase household wealth
- ▶ Consumption out of wealth leads to pro-cyclical business cycle movements

Housing investment and geographical mobility

- ▶ Housing investment reduces geographical mobility
- ▶ Limits geographical and sectoral labour market adjustments

House prices, wages and competitiveness

- ▶ House prices push wages and capital costs up
- ▶ Reduces firms' competitiveness

Model ideas I

Flow model of the labour market

- ▶ Empirical formulation of standard matching model (e.g. Carlsson et al., 2006)
- ▶ Full and separate account of unemployment in- and outflows
- ▶ Augmented with housing market channel

Housing investment model

- ▶ Housing investment affects aggregate demand through a wealth effect...
- ▶ ...hiring via wage effects,...
- ▶ ...and competitiveness through productivity effects (e.g. Askenazy, 2013)

Model ideas II

Wage-price dynamics

- ▶ Double Phillips curve (e.g. Flaschel et al. 1997; Erceg et al. 2000):
 - ▶ Reduced-form wage bargaining curve
 - ▶ Hybrid Phillips curve

Policy scenarios

- ▶ Short- vs. long-term effects of housing price dynamics
- ▶ Labour market policies
- ▶ Macro-prudential policies

An overview of the model flows I

- ▶ Decomposing unemployment dynamics into...

$$\Delta U_t = \Delta L_t - \Delta ET_t = IN_t - OUT_t$$

- ▶ ...Labour force growth and...

$$\Delta L_t = \alpha_3 + \beta_{31} \Delta L_{t-1} + \beta_{32} \Delta u_{t-1} + \beta_{33} Policy_t$$

- ▶ ...Employment growth (i.e. the net effect of job creation and destruction)

$$\Delta ET_t = JobCreation_t - JobDestruction_t$$

An overview of the model flows II

- ▶ Job creation with housing investment

$$JobCreation_t = \beta_{11}ET_{t-1} + \beta_{12}w_t + \beta_{13}AD_t + \beta_{14}r_t + \beta_{15}Inv_t + \beta_{16}HousingInvestment_{t-1}$$

- ▶ Job destruction with housing investment

$$JobDestruction_t = \beta_{21}TFP_t + \beta_{22}r_t + \beta_{23}REER_t + \beta_{24}AD_t + \beta_{25}w_t + \beta_{26}HousingInvestment_{t-1}$$

- ▶ Wage determination with housing investment:

$$w_t = \alpha_4 + \beta_{41}K_t + \beta_{42}Tax_t + \beta_{43}\Delta u_{t-1} + \beta_{44}HousingInvestment_t$$

Putting the pieces together

Substituting the flow equations:

$$OUT_t = JobCreation_t$$

$$IN_t = JobDestruction_t + \Delta L_{t-1}$$

Hence:

$$OUT_t = \tilde{\beta}_{11} OUT_{t-1} + \tilde{\beta}_{12} X_t^{JobCreation} + \tilde{\beta}_{14} \Delta ET_{t-1}$$

$$IN_t = \tilde{\beta}_{21} IN_{t-1} + \tilde{\beta}_{22} X_t^{JobDestruction} + \tilde{\beta}_{24} \Delta L_{t-1}$$

Modelling methodology I

Step-by-step estimation

Step 1: Identify base-line equations

- ▶ Macro variables to affect unemployment flows
- ▶ Reduced-form panel estimates
- ▶ System-GMM used to control for endogeneity
- ▶ Results published in Ernst (2011)

Step 2: Identify relevant housing market interactions

- ▶ Labour flow model refers to aggregate demand, but separates out housing investment
- ▶ Two separate sectors with capital accumulation:
 - ▶ Housing
 - ▶ Non-housing
- ▶ Housing investment also affects productivity and wage growth

Modelling methodology II

Step 3: Estimate macro model

- ▶ Introduce macro-economic closure: Modified Euler equation
- ▶ Introduce endogenous policy rules
- ▶ Estimate using GMM

Step 4: Simulate model and reform scenarios

- ▶ Model simulation and shock analysis using Dynare
- ▶ Reform scenarios through parametric change
- ▶ Analysis of shock transmission:
 - ▶ Productivity shocks
 - ▶ Housing investment shock
 - ▶ Asset price shock (share prices)
 - ▶ Combined shocks
- ▶ Analyse impact on unemployment dynamics

Housing markets and labour flows I

Two-sector approach (a la Iacoviello, 2010)

- ▶ Gross-fixed capital formation depends on profit outlook, public investment and real long-term interest rates:

$$K_t = K_{t-1} + F_{t-1} + G_{t-1}' + LP_{t-1} + r_{t-1}^L + K_t^{Housing}$$

- ▶ Housing investment depends on demographics and real interest rates:

$$K_t^{Housing} = K_{t-1}^{Housing} + r_{t-1}^L + Pop_{t-1}$$

Low productivity growth in construction

- ▶ Housing investment is less productive than in other sectors
- ▶ Average productivity declines with housing investment

Housing markets and labour flows II

Yield curve

- ▶ Wedge between long- and short-term interest rates
- ▶ Financial accelerator effect on long-term interest rates (Phelps, 1994)
- ▶ Short-term rates determined by household expectations, output gap and policy interventions
- ▶ Long-term rates with persistence determined by:
 - ▶ Share prices
 - ▶ Net government lending

A Housing-price Phillips curve

Price inflation, including imported inflation

$$\pi_t = \pi_{t-1} + E\pi_{t+1} + REER_{t-1} + Gap_{t-1}$$

Wage inflation, includes a housing element

$$w_t = w_{t-1} + ET_{t-1} + \pi_{t-1} + E\pi_{t+1} + TFP_{t-1} + I_{t-1}^{Housing}$$

Output gap dynamics

$$Gap_t = w_t + OUT_{t-1} + IN_{t-1} + GovCons_{t-1}$$

A word on the data and methodology

- ▶ **Unemployment flows** come from Elsby et al. (2008)
 - ▶ Constructed on the basis of information regarding unemployment duration at different duration lengths
 - ▶ Complemented by similar information for more years and other countries to improve coverage
 - ▶ Extended coverage possible using imputation methods with broadly similar results
- ▶ Information on **share price dynamics** is based on OECD share price index (OECD Main Economic Indicators) deflated by CPI
- ▶ **Housing investment** taken from OECD Economic Outlook database
- ▶ Other **Macro indicators** also come from the OECD Economic Outlook database
- ▶ **Fixed effects** have been accounted for through de-meaning:

$$dX_{it} = X_{it} - X_i + X_{..}$$

Estimation results: Labour block

(1)	IN_t	IN_{t-1}	ΔLFP_{t-1}	$\Delta Prod_{t-1}$	$RIRS_{t-1}$	$TaxInd_{t-1}$	Gap_t	$\Delta Wages_{t-1}$	$I_t^{Housing}$
		0.586*** (0.026)	-7.986*** (2.400)	-5.601*** (0.495)	0.006*** (0.001)	1.167 (1.53)	-0.017*** (0.003)	0.308** (0.142)	-1.347*** (0.489)
(2)	OUT_t	OUT_{t-1}	ETR_t	UCC_t	$\Delta Wages_t$	ΔINV_t	Gap_t	$I_t^{Housing}$	
		0.582*** (0.028)	1.360*** (0.218)	-0.004* (0.002)	-1.700*** (0.325)	3.701*** (0.764)	0.028*** (0.003)	2.600*** (0.716)	
(3)	ΔET_t	OUT_t	IN_t						
		0.015*** (0.002)	-0.019*** (0.004)						
(4)	$\Delta Wages_t$	$\Delta Wages_{t-1}$	π_{t-1}	$E\{\pi_{t+1}\}$	$\Delta Prod_t$	ΔET_{t-1}	$I_t^{Housing}$		
		0.656*** (0.040)	0.123** (0.063)	0.048* (0.027)	0.487*** (0.082)	0.255*** (0.042)	0.284*** (0.105)		
(5)	$\Delta Prod_t$	$\Delta Prod_{t-1}$	ΔTFP_{t-1}	$I_t^{Housing}$					
		0.714*** (0.091)	0.037*** (0.007)	-0.101** (0.005)					

Estimation results: Housing investment

	$RIRL_{t-1}$	GAP_t	ΔLF_{t-1}
(6) $I_t^{Housing}$	-0.002** (0.001)	0.002*** (0.000)	0.440*** (0.124)

Estimation results: Macro block

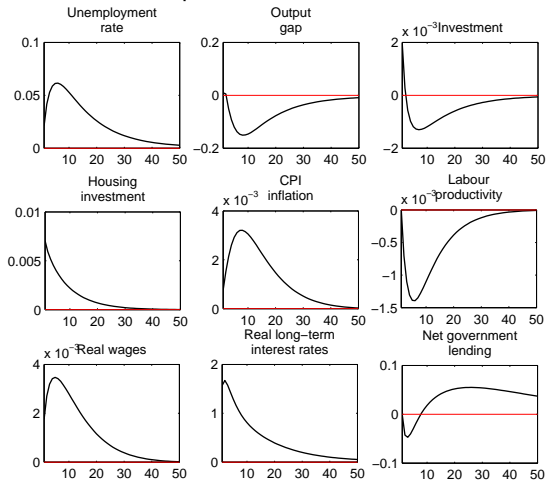
(7)	$RIRS_t$	$E\{RIRS_{t+1}\}$	GAP_t	$NLGQ_t$	π_{t-1}	
		1.157*** (0.018)	0.094*** (0.021)	-0.116*** (0.040)	-9.426*** (1.384)	
(8)	$RIRL_t$	$RShare_t$	$RIRL_{t-1}$	$RIRS_t$		
		0.700*** (0.186)	0.419** (0.012)	0.493*** (0.012)		
(9)	INV_t	$RShare_{t-1}$	$\Delta GovInv_{t-1}$	$\Delta Prod_{t-1}$	$RIRL_{t-1}$	ΔET_{t-1}
		0.004* (0.002)	2.687*** (0.921)	0.678*** (0.116)	-0.001*** (0.000)	0.547*** (0.034)
(10)	GAP_t	OUT_{t-1}	IN_{t-1}	$\Delta Wages_t$	$GovCons_{t-1}$	
		1.090*** (0.131)	-4.390*** (0.278)	4.971*** (1.357)	8.062*** (2.698)	
(11)	π_t	π_{t-1}	$E\{\pi_{t+1}\}$	ΔToT_{t-1}	$\Delta Wages_{t-1}$	
		0.449*** (0.018)	0.533*** (0.028)	-0.049*** (0.014)	0.041 (0.029)	

Estimation results: Fiscal block

		$GovCons_{t-1}$	ΔET_{t-1}	
(12)	$GovCons_t$	0.973*** (0.025)	0.025* (0.015)	
		$GovInv_{t-1}$	ΔET_{t-1}	
(13)	$GovInv_t$	0.959*** (0.042)	0.028*** (0.007)	
		OUT_{t-1}	IN_{t-1}	
(14)	Tax_t	0.010*** (0.001)	0.003 (0.003)	
		$GovCons_t$	$GovInv_t$	Tax_t
(15)	$NLGQ_t$	-88.626*** (4.530)	-122.280*** (9.230)	106.385*** (3.129)

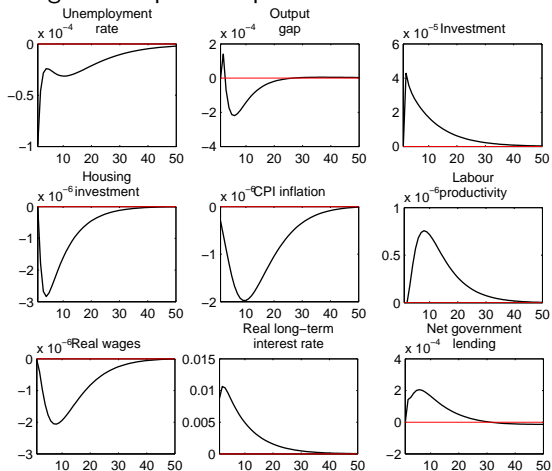
Unemployment and housing price shocks

An increase in housing investment raises unemployment through the competitiveness channel...



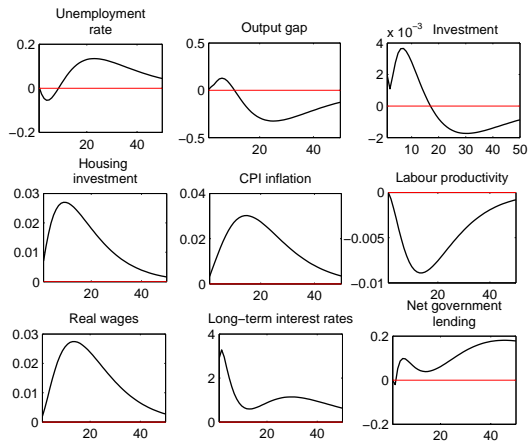
Share prices and labour markets

...whereas stronger asset prices improve the outlook for labour markets...



Asset price bubble and labour markets

...a simultaneous share-price-cum-housing boom benefits the labour market only temporarily

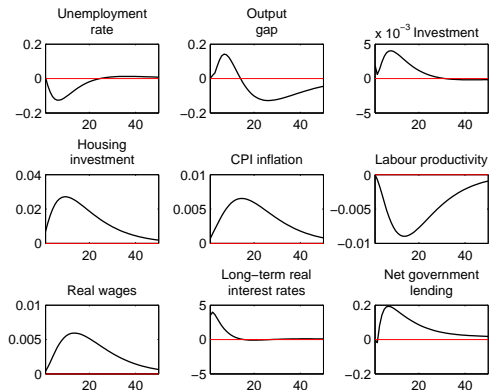


Policies to deal with asset bubbles

- ▶ What type of policies to prevent asset price booms?
 - ▶ Labour market policies
 - ▶ Reduce wage pass-through of housing prices to avoid loss of competitiveness
 - ▶ Macro-prudential regulation:
 - ▶ Policy rate needs to react strongly to changes in asset prices
- ▶ Simulations through parametric changes
 - ▶ Simulation 1: Reduction in elasticity of wages wrt to housing investment
 - ▶ Simulation 2: Integration of asset prices in the short-term interest rate equation

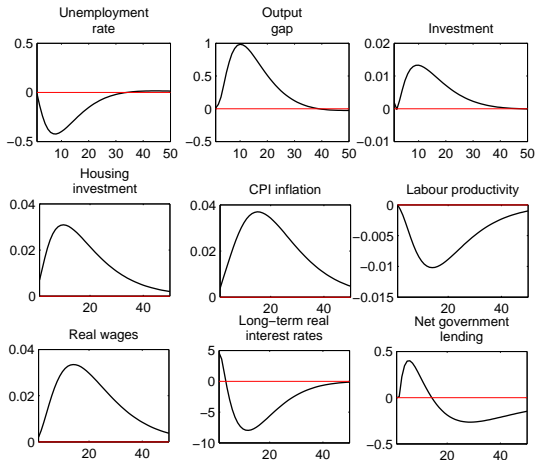
Change labour market institutions

Lower wage pass-through of housing boom



Macro-prudential regulation

Changes in the reactivity of the policy rate to asset prices



Lessons learned and outlook

What have we learned so far?

- ▶ Linear structural model allows full estimation of all parameters
- ▶ Pass-through play important role for labour flows and unemployment
- ▶ Allows detailed analysis of transmission mechanisms
- ▶ In particular, transmission of housing and asset prices can be easily assessed

Next steps

- ▶ Labour flow data available for 80 countries
- ▶ Develop open economy and global model (regional blocks)
- ▶ Allow for international spill-overs
- ▶ Integrate housing prices directly, rather than housing investment

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