The Labor Market Consequences of Adverse Financial Shocks
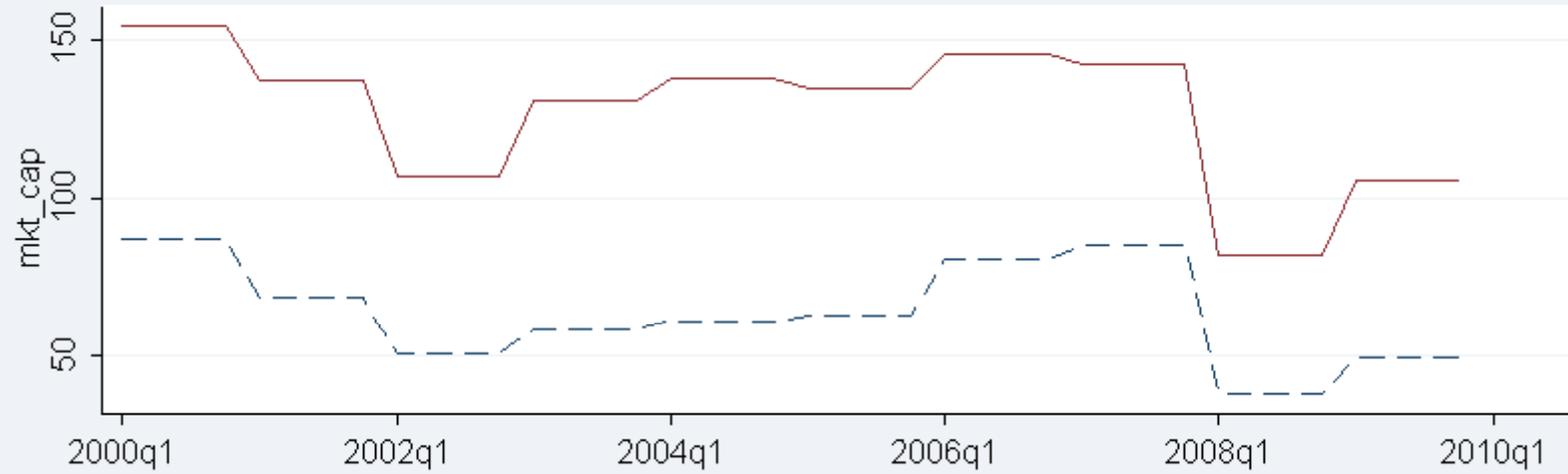
Tito Boeri and Pietro Garibaldi
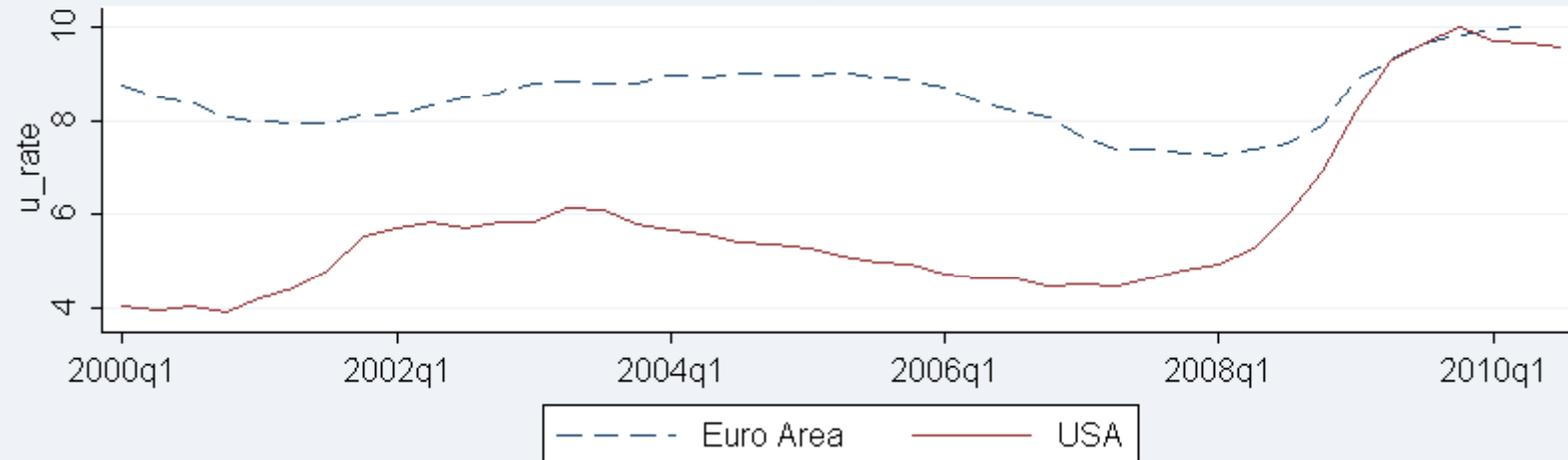
World Bank. November 19, 2011

Outline

- The Issue, the Questions, the Results

- Basic Facts

- Literature Review

- The Mechanism

- Empirical Strategy

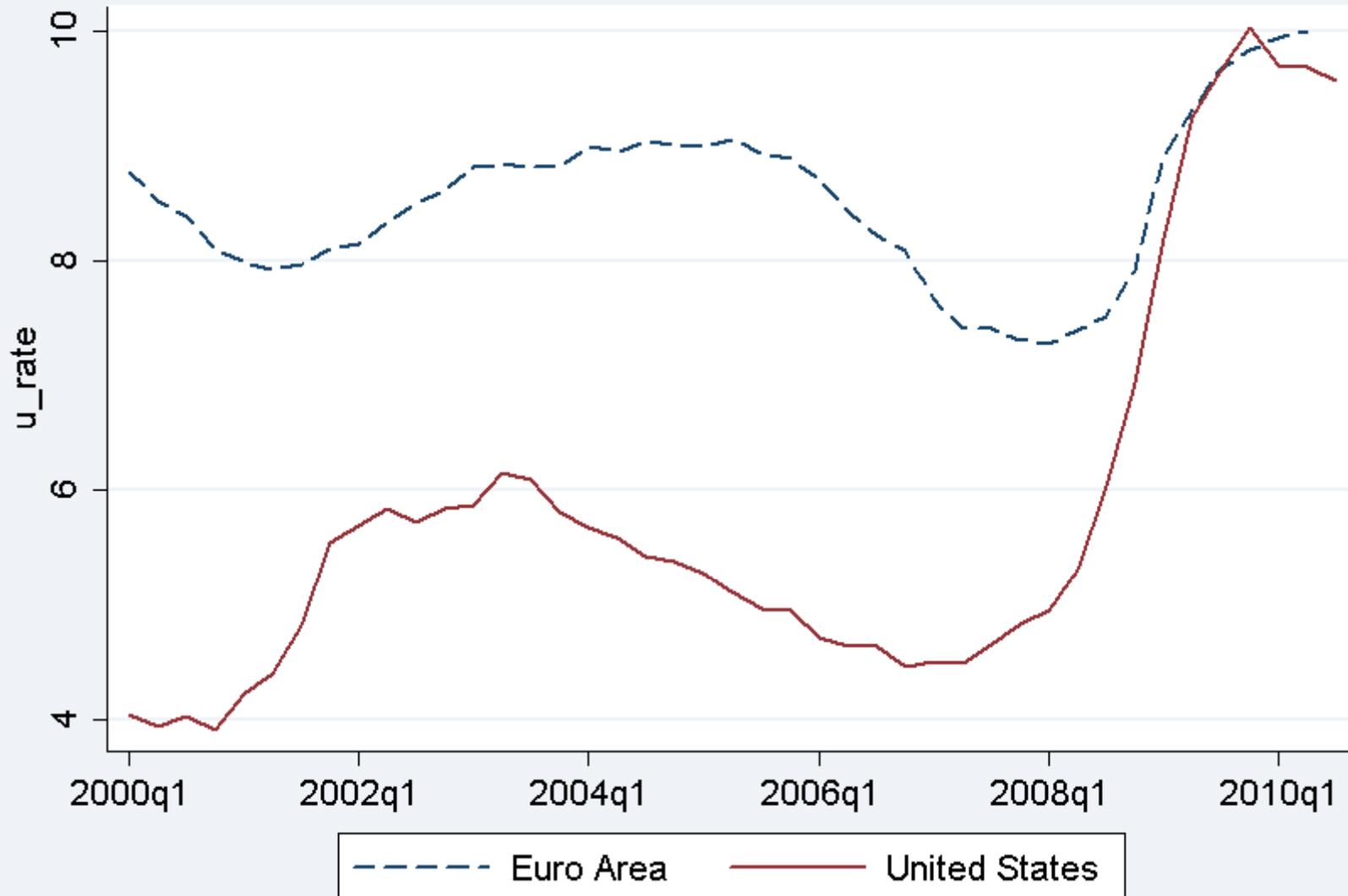- Results

- Policy and Conclusions

Market Capitalization-to-GDP Ratio

Unemployment Rate

Euro Area   USA

Unemployment Rate

Legend: Euro Area (dashed), United States (solid)

The Key Issue

- During the Great Recession (2008-2009), much larger labor market response in the US than in Europe
- If anything, increasing labour market flexibility in Europe (dualism) should have increased volatility of employment/unemployment
- One should probably look at finance, and explore links between financial shocks and labor market dynamics

The Key Questions

- Is it true that financial shocks (financial recessions) amplify labor market volatility?

- Which are the links between financial shocks and labor market dynamics?

- How does a credit crunch translate into job destruction and unemployment?

- How financial crises interact with traditional business cycle dynamics?

The Key Results

- 1) Financial recessions do amplify Okun's elasticities

- 2) Conditional on a financial shock, some evidence that
  - 2.1 more leveraged sector/countries experience larger volatility (*job destruction effect*)
  - 2.2 the *nightmare situation* is high leverage and low epl (triple interaction)
  - 2.3. the individual probability of moving is adversely affected by presence of mortgage (*job creation effect*)

- 3) We confirm that financial deepening has growth effects in normal times

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1. From the "Great Moderation" to the "Great Volatility"

- Estimate of time varying Okun's betas (rolling regressions, 5 years window) for the G7 as a whole

$$\Delta u_t = c - \beta_t \Delta y_t$$

- **y** denotes GDP and **u** is the unemployment rate, both measured at quarterly frequencies
- Is the Great Moderation over and the Great Volatility is coming back?

Unemployment to Output Response in G7
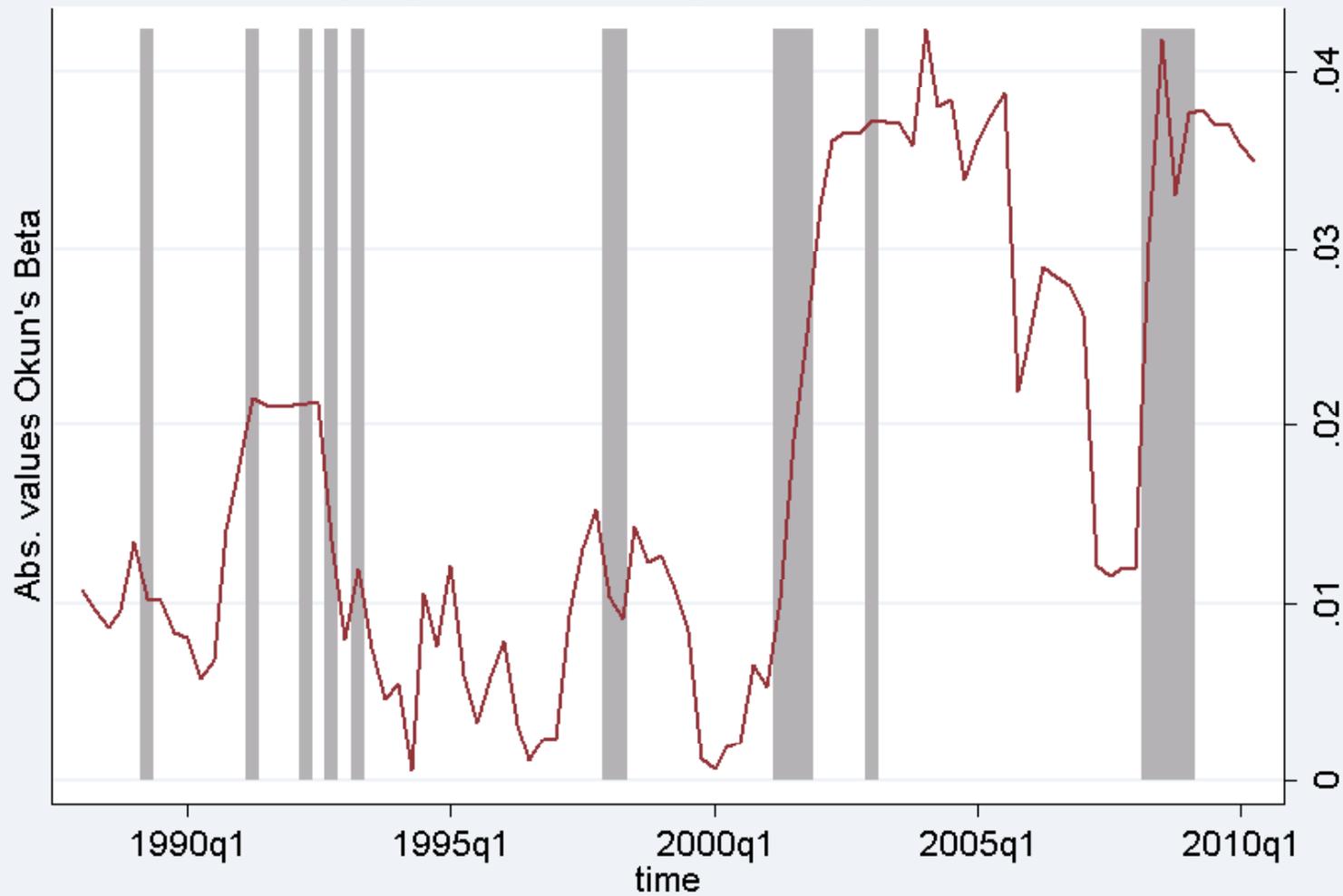
2. Financial recessions are different animals

- Compare *employment* to output elasticity during the Great Recessions with previous financial as well as non-financial crises (Reinhart and Rogoff , 2008 taxonomy)
- We look at average "β" coefficients for financial crises and other recessions
- Financial Crises have different effects on Employment than other Recessions?

Employment-to-Output Elasticities and Type of Recession

Financial Crisis

Housing Busts
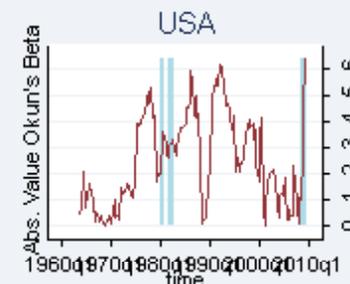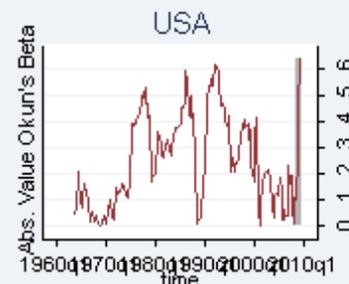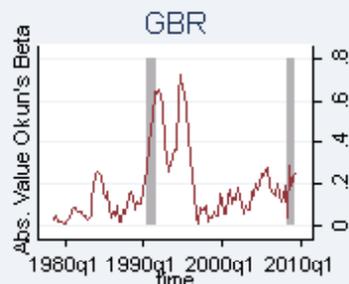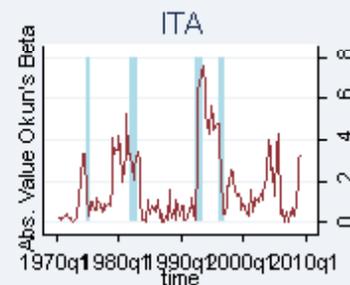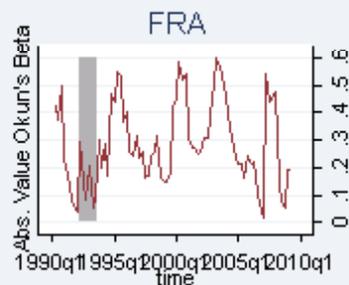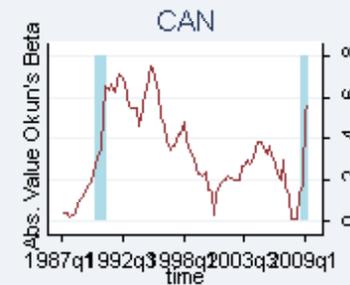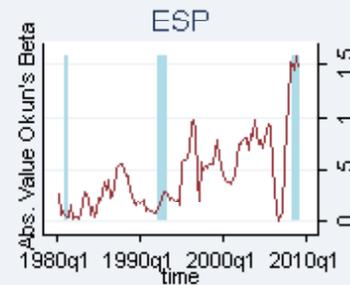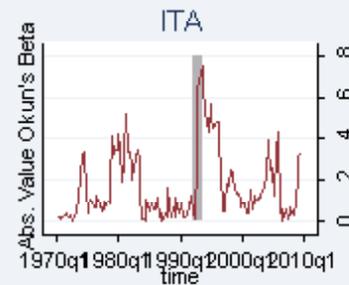
Employment to Output Elasticities, average period

Country	Overall	Peak-to-peak with financial crisis	Peak-to-peak without financial crisis (1)
Canada	0,336	0,557	-
France	0,286	0,273	0,314
Germany	0,192	-	0,214
Ireland	0,057	0,169	0,050
Italy	0,173	0,287	0,163
Spain	0,445	0,495	0,149
Sweden	0,269	0,300	0,136
UK	0,184	0,241	-
US	0,251	0,368	0,265

(1) Harding and Pagan

Literature Review

- Not much on links between financial crises and labor market dynamics
- More on (steady state) interactions between financial and labor frictions. Ambiguous predictions:
  - Rendon (2000), Belke and Fehn (2002) easy access by firms to financial markets as a substitute for labour market flexibility
  - Financial market liberalisation complementary to labor market deregulation (Boeri , Galasso and Conde-Ruiz, 2006; Wasmer and Weil, 2003;).

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The Job Destruction (JD) Effect

- More leveraged firms and more financial deepening can certainly be growth enhancing over the medium term

- Yet, what happens when a more leveraged sector experiences a financial shock and liquidity is suddenly pulled back?

- The lack of liquidity can force firms to liquidate projects as well as *jobs,* thus enhancing job destruction.

- It's a **labor demand** effect

The Worker Reallocation (WR) Effect

- Workers need financial markets and mortages to finance real estate investment
- Over the medium run, more financial deepening likely to increase workers ability to move across space and facilitate real estate investments
- Yet, during a financial crisis, real estate prices drop, workers face risk of negative equity and mobility is reduced
- This mobility effect of finance can increase unemployment at given vacancy rates
- It is a **labor supply** effect

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Empirical Strategy: I The JD effect

- Eploit three sources of variation (country, time, sector) to identify the first theoretical mechanisms outlined above
- Macro data from Oecd and Imf. Two steps procedure
- 1) first we run in each country a rolling regression of an employment to output equation of the type

$$\Delta e_{jt} = \alpha + \gamma_{jt} + \Delta y_{jt} + u_{jt}$$

- where subscripts j and t index sectors and quarters.
- 2) next we pool across countries the results of the first stage regression and we run a (weighted) regression of these elasticities against a number of institutional and financial variables

VARIANCE DECOMPOSITION

Variable	Group		Mean	Std. Dev.	Min	Max	Observations	
Debt to Sales	overall		156.95	498.40	0.00	11199.52	N =	4704
	between	sector-country		289.27	0.00	2392.89	n =	92
	within	sector-country		427.83	-2229.06	8963.58	T =	51.13
	between	country		134.06	50.07	678.79	n =	18
	within	country		485.95	-515.19	10677.68	T =	261.33

| Variable	Group		Mean	Std. Dev.	Min	Max	Observations	
Debt to Assets	overall		55.03	356.50	0.00	6652.25	N =	4704
	between	sector-country		175.60	0.00	1703.13	n =	92
	within	sector-country		286.56	-1619.88	5004.15	T =	51.13
	between	country		89.93	17.56	406.17	n =	18
	within	country		340.93	-335.90	6301.11	T-bar =	261.33

Variable	Group		Mean	Std. Dev.	Min	Max	Observations	
EPL overall	overall		1.97	0.97	0.21	3.67	N −	6185
	between	sector-country		0.90	0.21	3.49	n =	101
	within	sector-country		0.30	0.97	2.79	T-bar =	61.24
	between	country		0.93	0.21	3.49	n =	18
	within	country		0.30	0.97	2.79	T-bar =	343.61
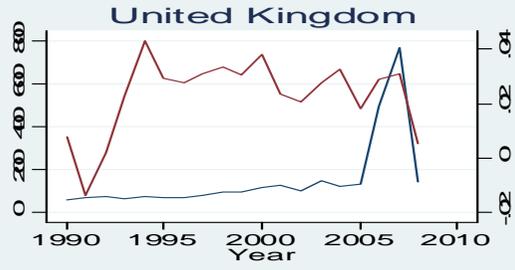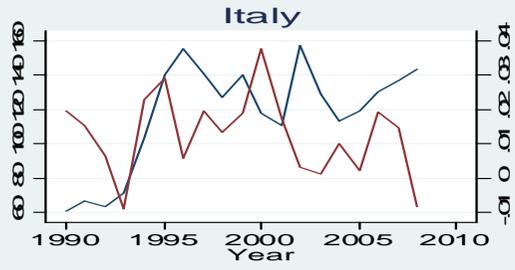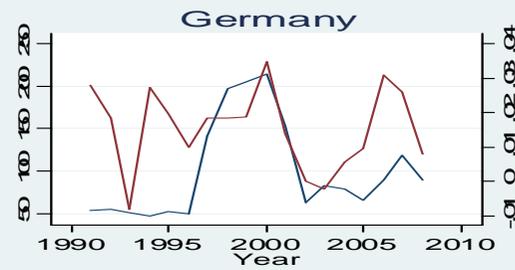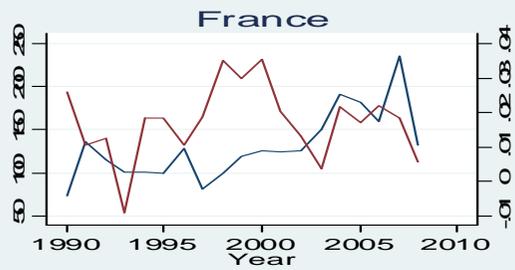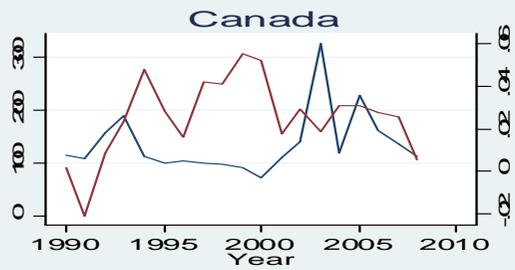
Note: blue line represents debt to sales and red line represents gdp growth
left Y axis measures debt to sales and right Y axis measures gdp growth
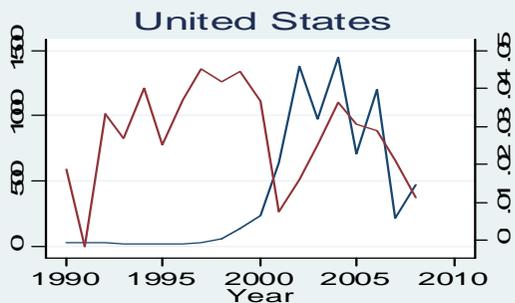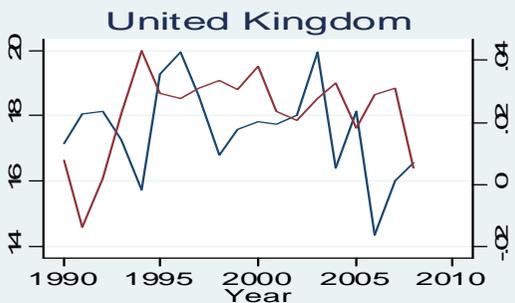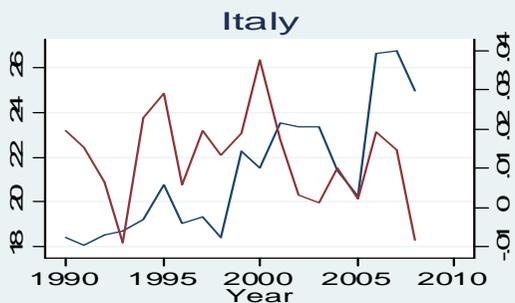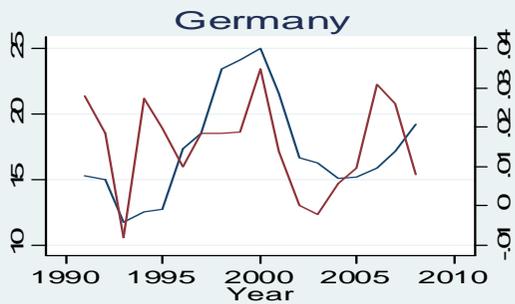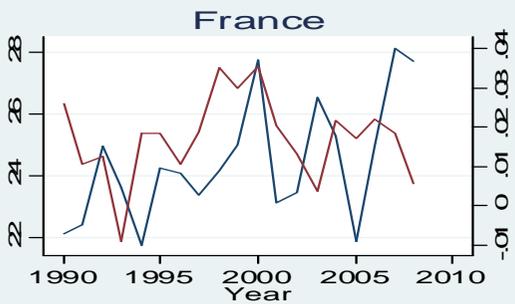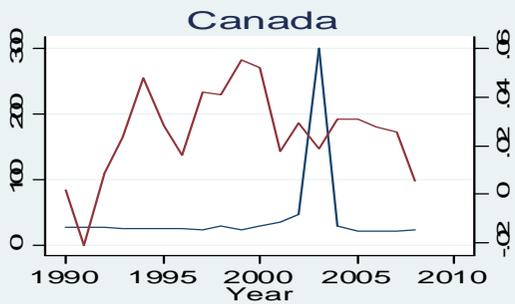
Note: blue line represents debt to asset; red line represents gdp growth
left Y axis measures debt to asset and right Y axis measures gdp growth

EMPLOYMENT TO OUTPUT ELASTICITIES

		Obs.	Mean	St. Dev.	Min.	Max.
Country	Australia	474	0,170	0,408	-1,399	1,167
	Austria	395	0,315	0,431	-0,722	3,179
	Belgium	518	0,094	0,219	-0,781	0,803
	Canada	90	-0,490	1,394	-5,220	2,190
	Denmark	348	0,034	0,123	-0,258	0,359
	Finland	708	0,183	0,413	-1,183	2,562
	France	348	0,166	0,285	-0,402	1,031
	Germany	324	0,093	0,128	-0,199	0,418
	Greece	108	0,027	0,178	-0,426	0,400
	Ireland	108	0,097	0,269	-0,274	0,925
	Italy	564	0,115	0,317	-0,885	1,085
	Netherlands	420	0,081	0,473	-0,874	2,326
	Norway	228	0,049	0,228	-0,569	0,758
	Portugal	228	0,112	0,357	-0,794	1,233
	Spain	228	0,213	0,446	-0,568	2,949
	Sweden	138	-0,031	0,542	-1,170	2,647
	United Kingdom	630	0,144	0,202	-0,497	0,988
	United States	890	0,220	0,243	-0,237	1,092
Sector	agr	1.023	0,004	0,209	-0,935	0,995
	constr	1.202	0,213	0,549	-5,220	2,949
	fin	1.126	0,202	0,462	-1,399	3,179
	ind	1.202	0,110	0,212	-0,914	1,068
	pub	1.068	0,215	0,371	-1,183	1,789
	trade	1.126	0,061	0,221	-0,752	1,129
Overall		**6747**	**0,136**	**0,375**	**-5,220**	**3,179**

LEVERAGE: DEBT TO SALES	DUMMY-VARIABLE ESTIMATOR		
	(1)	(2)	(3)
Leverage	**-0.0002*****	**0.0001****	**-0.0001**
	(0.0001)	(0.0001)	(0.0001)
Financial-related recession	**0.0943*****	**0.1249*****	**0.0869*****
	(0.0220)	(0.0266)	(0.0303)
EPL	-0.0795***	-0.0802***	-0.0252
	(0.0138)	(0.0167)	(0.0171)
Temp. Workers			0.0027
			(0.0036)
Leverage*Temp*Fin. Crisis			**0.0004****
			(0.0002)
Leverage*lowEPL*Fin. Crisis	**0.0006*****	**-0.0003**	
	(0.0002)	(0.0002)	
Constant	0.3183***	0.1746***	0.1624**
	(0.0390)	(0.0487)	(0.0689)
Country*Sector FE	YES	NO	NO
Country FE	NO	YES	YES
Year Dummies	YES	YES	YES
Quarter Dummies	YES	YES	YES
Sector Dummies	NO	YES	YES
Observations	4,072	4,072	3,456
R-squared	0.4611	0.1740	0.4818

LEVERAGE: DEBT TO ASSETS	DUMMY-VARIABLE ESTIMATOR		
	(1)	(2)	(3)
Leverage	**-0.0013***	**0.0001**	**-0.0017****
	(0.0006)	(0.0005)	(0.0007)
Financial-related recession	**0.1085***	**0.1110***	**0.0522**
	(0.0265)	(0.0323)	(0.0521)
EPL	-0.0852***	-0.0774***	-0.0297*
	(0.0139)	(0.0168)	(0.0171)
Temp. Workers			0.0023
			(0.0036)
Leverage*Temp*Fin. Crisis			**0.0036**
			(0.0024)
Leverage*lowEPL*Fin. Crisis	**0.0011**	**0.0002**	
	(0.0016)	(0.0019)	
Constant	0.3478***	0.1687***	0.2102***
	(0.0426)	(0.0503)	(0.0715)
Country*Sector FE	YES	NO	NO
Country FE	NO	YES	YES
Year Dummies	YES	YES	YES
Quarter Dummies	YES	YES	YES
Sector Dummies	NO	YES	YES
Observations	4,072	4,072	3,456
R-squared	0.4593	0.1729	0.4821

| LEVERAGE: | WEIGHTED REGRESSION: W_I = VAR(BETA$_I$) | |
| COL. (1) DEBT TO SALES | | |
COL. (2) DEBT TO ASSETS	(1)	(2)
Leverage	**-0.0004**	**0.0307*** **
	(0.0004)	(0.0091)
Financial-related recession	**0.1843** **	**0.0433**
	(0.0816)	(0.0903)
EPL	-0.5379***	-0.3844***
	(0.1588)	(0.1116)
Leverage*lowEPL*Fin. Crisis	**0.0034*** **	**0.0301*** **
	(0.0010)	(0.0096)
Constant	0.7447**	-0.2536
	(0.3364)	(0.2974)
Country*Sector FE	YES	YES
Year Dummies	YES	YES
Quarter Dummies	YES	YES
Observations	4,284	4,284
R-squared	0.7764	0.7818

Summary of Results on JD effect

- Conditional on a financial shock,
  - 2.1 more leveraged sector/countries experience larger volatility (*job destruction effect*)
  - 2.2 the *nightmare situation* is high leverage and low epl (triple interaction)
- Identification come mainly from within variation. Results are robust to weighting by SE first stage coeff, exclusion of zero gammas, etc.

Empirical Strategy: II. The WR effect

- Estimate probit models (using micro data from ECHP, 1994-2001) for the probability of moving in general and specifically for for job related reasons

- Use of retrospective information on mobility

- Data on personal characteristics and assets

- Conditional on a financial shock, does the presence of mortgage reduce labour mobility

PROBABILITY OF MOVING	(1)	(2)	(3)
Age	-0.0249***	-0.0249***	-0.0249***
	(0.000159)	(0.000159)	(0.000159)
Female	0.0121***	0.0118**	0.0121**
	(0.00471)	(0.00471)	(0.00471)
Education	0.0603***	0.0599***	0.0601***
	(0.00315)	(0.00315)	(0.00315)
Household size	-0.200***	-0.199***	-0.200***
	(0.00190)	(0.00190)	(0.00190)
Crisis dummy	**-0.132*** **	**-0.112*** **	**-0.119*** **
	(0.0190)	(0.0198)	(0.0193)
Mortgage*Crisis	**-0.0233*** **	**-0.0235*** **	**-0.0238*** **
	(0.00852)	(0.00852)	(0.00852)
Time trend			0.00393***
			(0.00108)
Constant	-0.395***	-0.428***	-8.238***
	(0.0173)	(0.0188)	(2.166)
Country Dummy	Yes	Yes	Yes
Year Dummy	No	Yes	No
Observations	1,095,048	1,095,048	1,095,048

PROBABILITY OF MOVING FOR JOB-RELATED REASONS	(1)	(2)	(3)
Age	-0.0173***	-0.0167***	-0.0168***
	(0.000530)	(0.000535)	(0.000535)
Female	-0.0290**	-0.0271**	-0.0274**
	(0.0118)	(0.0119)	(0.0119)
Education	0.142***	0.148***	0.148***
	(0.00764)	(0.00773)	(0.00771)
Household size	-0.0908***	-0.0875***	-0.0874***
	(0.00468)	(0.00473)	(0.00470)
Crisis dummy	**0.347***	**0.114*	**0.116*
	(0.0599)	(0.0621)	(0.0607)
Mortgage*Crisis	**-0.496***	**-0.473***	**-0.474***
	(0.0225)	(0.0227)	(0.0227)
Time trend			-0.0740***
			(0.00286)
Constant	-1.609***	-1.177***	146.1***
	(0.0483)	(0.0522)	(5.717)
Country Dummy	Yes	Yes	Yes
Year Dummy	No	Yes	No
Observations	234,187	234,187	234,187

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- Further Research, preliminary Policy Conclusions

Further work

- Continuous measures of financial stress (FSI)?

- Measures of uncertainty

- Focus on the big 5?

- EPL, temporary employment and leverage ratios. Another mechanism

Policy so far

- Financial deepening is associated with less employment volatility (and medium run growth). Thus, an orderly financial deepening is desirable

- Yet, during business cycles things can really turn bad.

- Preserve jobs or preserve financial institutions? During the Great Recession maybe **too much emphasis on saving financial institutions rather than on savings jobs**

- How to do that? Financing more leveraged sectors? Extending short-time work? Subsidising job related mobility?

- Important to operate on both JD and WR effects

Preliminary Conclusions

- First attempt to explore the links between labor and finance
- Results
- 1) Financial recessions do amplify Okun's elasticities
- 2) Conditional on a financial shock,
  - 2.1 more leveraged sector/countries experience larger volatility (*job destruction effect*)
  - 2.2 the *nightmare situation* is high leverage and low epl (triple interaction)
  - 2.3. the individual probability of moving is adversely affected by presence of mortgage (*labour mobility effect*)
- With and hindsight, maybe policy had to be more focused on **savings jobs rather than financial institutions**