

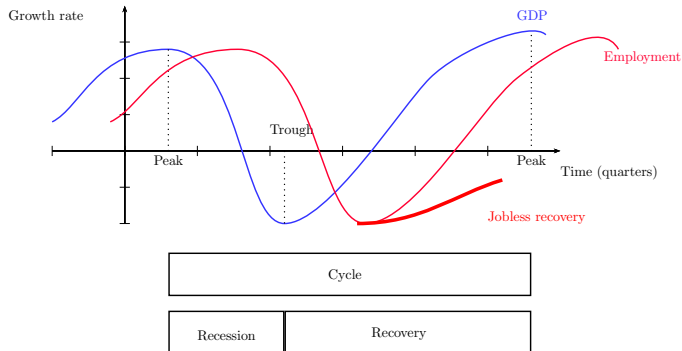
Jobless Recoveries: Intensive and Extensive Margin in Employment Recovery after a Financial Crisis

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Jobless recoveries



Jobless recovery: unusually weak/delayed growth of employment in the aftermath of a recession.

Why look at intensive margin ?

- Previous studies mix employment rate, total hours, unemployment leading to different conclusions.
- Different cost structure for hours and workers could lead to different impact of financial frictions.
- New data: Ohanian & Raffo 2012, harmonized dataset across countries and time.
- Different policy response.

Goal: identify impact of financial frictions:

- on the employment rate growth and on hours worked per worker growth
- during recoveries
- for a given recovery of GDP per capita
- in a given country, in a given period, for given labour market institutions

- Cycle dating: OECD from FRED
- Financial crises: Reinhart & Rogoff dataset:
 - "Bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that mark the start of a string of similar outcomes for other financial institutions"*
- Countries: Australia, Austria, Canada, Finland, France, Germany, Ireland, Italy, Japan, Korea, Norway, Spain, Sweden, UK, USA.

- Total number of observations: 2462 quarters (for which data on hours worked is available)
- Representing 140 distinct cycles.
- 63 cycles display a recession with a lower GDP per capita at trough than at the previous peak.
- 77 cycles display a mere contraction, a slowing down of the growth rate.
- 29 cycles display a financial crisis.

Recession length

- average = 8.5 quarters
- median = 8 quarters
- min=2 (Aus 2003, Aus 2006, Aut 1984, Fra 1972) max=19 (Fra 1987)

Recessions depth (peak to trough growth rate of GDP)

- Average = 1,13% (mild contraction); median = 0,9%
- From -13% (Ire 2008, Fin 1989) to 20% (Japan 1962)
- Average recession over time: 1960's: 6%; 1970's: 1%; 1980's: 0,9%; 1990's 0,6%; 2000's: 2,3%; 2006-2010: -3%

- Employment: employment rate.
- Labour market institutions: ICTWSS (Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts 1960-2011, Jelle Visser)
 - coord: 1 to 5 index, measures degree of coordination, from 0 to full centralization of wage-setting
 - level: 1 to 5 index, measures predominant level of wage bargaining, from plant level to national level bargaining.
 - unionization level.
- Quarterly gdp per capita in volume.

Employment rate:

- Average over whole sample: 67%
- From 59% (Austria, Italy) to 75% (USA)
- 1960's-1990's: 66%; 2000's 68%; 2006's 69%.

Coordination level of wage-bargaining

- level 1: 17%
- level 2: 12%
- level 3: 22%
- level 4: 30%
- level 5: 20%

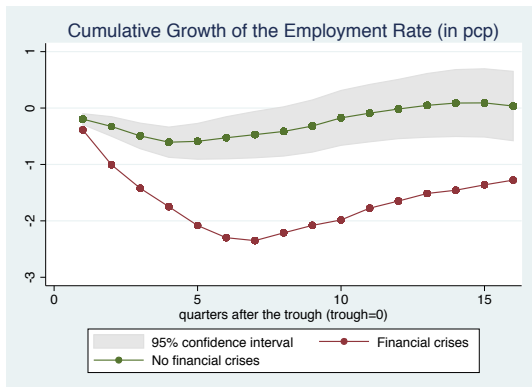
Ohanian and Raffo hours worked database:

- Combine different sources of data (ILO surveys, Conference Board, national sources, ...)
- 15 countries, harmonized.
- 1960 - 2010

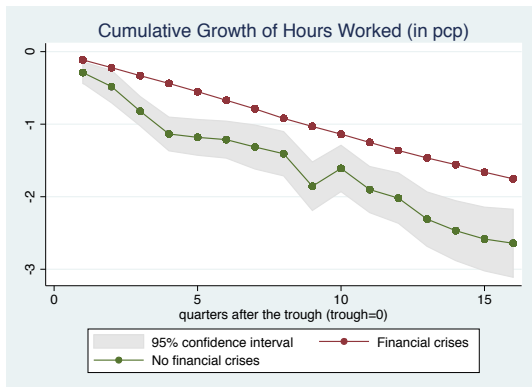
Hours worked:

- Strong decrease over time: 2080 (1960's) to 1680 (after 2006).
- Strong variation between countries: from around 1500 (Nor, Swe) to above 2200 (Ire, Jap, Kor)

Employment growth during recoveries with and without financial crises



Hours worked growth during recoveries with and without financial crises



Estimated model for employment/hours

Employment rate (Hours worked) growth over i quarters =

$$\begin{aligned} & (\text{level of the employment rate (hours worked) } i \text{ quarters ago})_{t-i} \\ & + (\text{presence of a financial crisis during the recession})_t \quad (A) \\ & + (\text{dummy on being } i \text{ quarters after trough})_t \quad (B) \\ & + (A) * (B) \\ & + (\text{GDP growth over the last } i \text{ quarters})_{t-2} \\ & + (\text{degree of wage coordination})_t \\ & + \text{dummies: 1960, 1970, 1980, 1990, 2000, 2006} \\ & + \text{constant} \\ & + u_i(\text{country-specific error term}) + e_{it} \end{aligned}$$

Employment

VARIABLES	Employment rate growth over <i>i</i> quarters									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Financial crisis	-0.0465 (0.0394)	-0.0633 (0.0631)	-0.0659 (0.0821)	-0.108 (0.103)	-0.187 (0.121)	-0.263* (0.140)	-0.313** (0.157)	-0.402** (0.173)	-0.437** (0.187)	-0.452** (0.199)
gdp growth L2	0.0784*** (0.0115)	0.208*** (0.0129)	0.306*** (0.0123)	0.347*** (0.0123)	0.376*** (0.0124)	0.400*** (0.0127)	0.413*** (0.0131)	0.416*** (0.0135)	0.418*** (0.0137)	0.414*** (0.0139)
trough#fin_crisis	-0.123 (0.101)	-0.127 (0.161)	-0.107 (0.209)	-0.0315 (0.263)	0.156 (0.323)	0.314 (0.384)	0.455 (0.474)	0.681 (0.543)	0.895 (0.616)	0.894 (0.767)
coord	0.0482*** (0.0159)	0.0881*** (0.0255)	0.116*** (0.0331)	0.142*** (0.0414)	0.172*** (0.0490)	0.190*** (0.0565)	0.223*** (0.0635)	0.254*** (0.0704)	0.264*** (0.0762)	0.291*** (0.0820)
average recovery	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,393	1,383	1,372	1,364	1,357	1,350	1,343	1,336	1,327	1,318
R-squared	0.097	0.214	0.349	0.410	0.456	0.486	0.505	0.516	0.531	0.539
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Hours worked growth over <i>i</i> quarters									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Financial crisis	0.0154 (0.0905)	0.0478 (0.0864)	0.109 (0.0924)	0.217** (0.106)	0.202* (0.106)	0.221* (0.115)	0.282** (0.120)	0.276** (0.128)	0.330** (0.129)	0.348*** (0.134)
gdp growth L2	0.0116 (0.0264)	-0.0103 (0.0176)	0.0235* (0.0138)	0.0383*** (0.0126)	0.0402*** (0.0108)	0.0407*** (0.0103)	0.0408*** (0.00993)	0.0376*** (0.00972)	0.0402*** (0.00915)	0.0400*** (0.00907)
trough#fin_crisis	-0.0247 (0.232)	-0.119 (0.220)	0.123 (0.235)	-0.126 (0.271)	0.467* (0.283)	0.735** (0.315)	0.740** (0.363)	0.655 (0.399)	-0.0696 (0.423)	0.270 (0.517)
coord	-0.0348 (0.0363)	-0.0511 (0.0347)	-0.0852** (0.0370)	-0.0931** (0.0424)	-0.107** (0.0426)	-0.121*** (0.0459)	-0.148*** (0.0483)	-0.172*** (0.0513)	-0.183*** (0.0518)	-0.192*** (0.0546)
Observations	1,393	1,383	1,372	1,364	1,357	1,350	1,343	1,336	1,327	1,318
R-squared	0.021	0.037	0.057	0.071	0.097	0.118	0.129	0.146	0.174	0.192
average recovery	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

How financial frictions interact with labour market characteristics

- Higher degree of coordination (4 or 5) dampens the positive impact of financial crises on hours worked.
- Middle degree of coordination (3) re-inforces the positive impact of financial crises on hours worked.
- Financial crises keeps significant positive impact on average.

Also robust to:

- dropping countries.
- dropping post 2006 crises.
- alternative financial crises definition (Laeven & Valencia).
- alternative GDP control strategies.
- not using interaction terms.

Additional results:

- Total hours growth rate: negative impact of financial crises, compensated by strong positive impact of financial crises during recoveries.
- Results on hours worked per worked hold only after 1990.
- Using 1 observation per cycle: results hold in terms of sign of coefficient, strong loss of significance.

During recoveries following financial crises:

- Employment rate growth is weaker in presence of financial crisis
 - that displays the same GDP fall during the recession
 - in the same country, same decade
 - with the same type of labour institutions.
- Hours recover more strongly.

↔ the intensive margin matters, especially with financial frictions.

Alternative financial crisis definition: Laeven and Valencia

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis LV	-0.173*** (0.0616)	-0.393*** (0.0961)	-0.521*** (0.122)	-0.832*** (0.151)	-1.173*** (0.180)	-1.428*** (0.209)	-1.617*** (0.228)	-1.879*** (0.250)	-2.010*** (0.266)	-2.179*** (0.284)
gdp L2	0.0664*** (0.0120)	0.198*** (0.0132)	0.301*** (0.0124)	0.344*** (0.0122)	0.374*** (0.0126)	0.398*** (0.0131)	0.413*** (0.0135)	0.416*** (0.0139)	0.420*** (0.0141)	0.418*** (0.0143)
trough#fin_crisis_LV	-0.373*** (0.144)	-0.00175 (0.222)	0.0789 (0.278)	0.581* (0.337)	1.150*** (0.421)	1.504*** (0.499)	2.006*** (0.771)	1.268 (1.030)	0.550 (2.142)	0.333 (2.294)
coord	0.0374** (0.0169)	0.0695*** (0.0262)	0.0952*** (0.0330)	0.125*** (0.0403)	0.163*** (0.0479)	0.202*** (0.0551)	0.257*** (0.0615)	0.309*** (0.0682)	0.370*** (0.0741)	0.446*** (0.0797)
Observations	1,596	1,583	1,570	1,560	1,552	1,542	1,533	1,525	1,515	1,504
R-squared	0.094	0.197	0.342	0.421	0.467	0.500	0.524	0.534	0.546	0.552
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Hours worked in the recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis (LV)	0.186 (0.140)	0.217 (0.133)	0.377*** (0.143)	0.448*** (0.167)	0.402** (0.168)	0.450** (0.184)	0.447** (0.189)	0.375* (0.200)	0.439** (0.200)	0.485** (0.211)
gdp L2	0.0121 (0.0271)	-0.00966 (0.0180)	0.0278* (0.0142)	0.0432*** (0.0132)	0.0449*** (0.0113)	0.0447*** (0.0110)	0.0437*** (0.0106)	0.0385*** (0.0105)	0.0416*** (0.00988)	0.0424*** (0.00979)
trough_1#fin_crisis LV	-0.148 (0.338)	-0.0250 (0.317)	0.266 (0.335)	0.351 (0.385)	1.015** (0.395)	1.083** (0.441)	1.716*** (0.643)	2.978*** (0.867)	1.999 (1.470)	2.915* (1.548)
coord	-0.0350 (0.0378)	-0.0495 (0.0358)	-0.0816** (0.0381)	-0.0876** (0.0438)	-0.103** (0.0437)	-0.113** (0.0470)	-0.133*** (0.0494)	-0.154*** (0.0526)	-0.168*** (0.0535)	-0.175*** (0.0565)
Observations	1,340	1,329	1,318	1,310	1,303	1,296	1,289	1,282	1,274	1,267
R-squared	0.025	0.044	0.070	0.084	0.113	0.131	0.141	0.161	0.184	0.203
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Also robust to using Eichengreen and Bordo's definition.

Alternative GDP control

GDP from peak to trough and squared.

VARIABLES	Employment rate recovery								
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters
fin crisis	-0.0406 (0.0395)	-0.0593 (0.0605)	-0.0782 (0.0758)	-0.147 (0.0918)	-0.216** (0.108)	-0.296** (0.122)	-0.352*** (0.134)	-0.450*** (0.145)	-0.483*** (0.156)
gdp during rec	0.0173*** (0.00400)	0.0283*** (0.00629)	0.0325*** (0.00808)	0.0428*** (0.0100)	0.0523*** (0.0122)	0.0532*** (0.0144)	0.0583*** (0.0164)	0.0752*** (0.0182)	0.0790*** (0.0198)
gdp during rec sq	-0.000857*** (0.000257)	-0.00199*** (0.000393)	-0.00335*** (0.000492)	-0.00499*** (0.000595)	-0.00711*** (0.000698)	-0.00900*** (0.000793)	-0.0108*** (0.000875)	-0.0130*** (0.000954)	-0.0147*** (0.00103)
gdp growth L2	0.0681*** (0.0125)	0.200*** (0.0139)	0.303*** (0.0132)	0.346*** (0.0132)	0.379*** (0.0138)	0.410*** (0.0148)	0.428*** (0.0156)	0.430*** (0.0162)	0.437*** (0.0167)
trough#fin_crisis	-0.137 (0.0999)	-0.0974 (0.153)	-0.120 (0.192)	0.0532 (0.234)	0.126 (0.287)	0.243 (0.335)	0.248 (0.409)	0.617 (0.480)	0.763 (0.563)
coord	0.0312* (0.0173)	0.0658** (0.0265)	0.102*** (0.0332)	0.139*** (0.0402)	0.184*** (0.0473)	0.231*** (0.0538)	0.281*** (0.0593)	0.324*** (0.0648)	0.377*** (0.0696)
Observations	1,559	1,557	1,555	1,553	1,551	1,547	1,544	1,542	1,537
R-squared	0.094	0.208	0.356	0.436	0.488	0.525	0.553	0.571	0.585
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Hours worked in the recovery

VARIABLES	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	-0.0110 (0.0948)	0.0254 (0.0895)	0.0474 (0.0947)	0.149 (0.109)	0.137 (0.108)	0.164 (0.116)	0.243** (0.121)	0.259** (0.128)	0.317** (0.130)	0.337** (0.130)
gdp during rec	-0.00799 (0.00823)	-0.00909 (0.00801)	-0.0236*** (0.00872)	-0.0275*** (0.0103)	-0.0285*** (0.0106)	-0.0286** (0.0119)	-0.0227* (0.0129)	-0.0111 (0.0140)	-0.00304 (0.0143)	0.00001 (0.0143)
gdp during rec sq	0.000580 (0.000542)	0.00103** (0.000512)	0.00153*** (0.000543)	0.00173*** (0.000624)	0.00181*** (0.000620)	0.00214*** (0.000667)	0.00225*** (0.000700)	0.00216*** (0.000741)	0.00220*** (0.000747)	0.00220*** (0.000747)
gdp L2	0.0252 (0.0282)	0.000746 (0.0191)	0.0399*** (0.0151)	0.0554*** (0.0142)	0.0567*** (0.0125)	0.0563*** (0.0126)	0.0534*** (0.0125)	0.0431*** (0.0126)	0.0396*** (0.0121)	0.0396*** (0.0121)
trough_1#fin_crisis	-0.0449 (0.233)	-0.157 (0.220)	0.0736 (0.234)	-0.185 (0.271)	0.433 (0.280)	0.683** (0.312)	0.703* (0.360)	0.613 (0.396)	-0.0699 (0.421)	0.00001 (0.421)
coord	-0.0394 (0.0387)	-0.0620* (0.0366)	-0.0889** (0.0387)	-0.0946** (0.0444)	-0.109** (0.0441)	-0.124*** (0.0474)	-0.162*** (0.0497)	-0.194*** (0.0526)	-0.200*** (0.0530)	-0.200*** (0.0530)
Observations	1,299	1,298	1,297	1,296	1,295	1,294	1,293	1,292	1,289	1,289
R-squared	0.027	0.048	0.077	0.093	0.120	0.142	0.156	0.172	0.196	0.196
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Alternative GDP control

GDP over same period (not lagged)

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	-0.0807** (0.0378)	-0.125** (0.0590)	-0.175** (0.0764)	-0.251*** (0.0932)	-0.344*** (0.110)	-0.481*** (0.129)	-0.633*** (0.142)	-0.730*** (0.156)	-0.785*** (0.169)	-0.799*** (0.180)
gdp	0.0788*** (0.0129)	0.228*** (0.0155)	0.340*** (0.0153)	0.396*** (0.0144)	0.426*** (0.0142)	0.433*** (0.0144)	0.433*** (0.0142)	0.430*** (0.0142)	0.429*** (0.0143)	0.419*** (0.0144)
trough#fin_crisis	-0.181* (0.0990)	-0.168 (0.154)	-0.132 (0.200)	-0.0806 (0.244)	-0.167 (0.302)	0.141 (0.361)	0.390 (0.447)	0.529 (0.529)	1.093* (0.622)	0.944 (0.771)
coord	0.0348** (0.0162)	0.0657*** (0.0253)	0.0868*** (0.0327)	0.114*** (0.0398)	0.163*** (0.0475)	0.203*** (0.0553)	0.265*** (0.0620)	0.313*** (0.0684)	0.358*** (0.0741)	0.403*** (0.0799)
Observations	1,683	1,670	1,657	1,644	1,632	1,621	1,612	1,604	1,594	1,582
R-squared	0.084	0.169	0.273	0.360	0.406	0.424	0.445	0.460	0.476	0.482
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Hours worked in the recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Fin crisis	0.0326 (0.0901)	0.0871 (0.0860)	0.143 (0.0916)	0.270*** (0.104)	0.259** (0.105)	0.284** (0.113)	0.338*** (0.118)	0.337*** (0.125)	0.368*** (0.127)	0.399*** (0.133)
gdp	0.0775*** (0.0288)	0.0759*** (0.0210)	0.0811*** (0.0169)	0.0977*** (0.0148)	0.0887*** (0.0122)	0.0815*** (0.0114)	0.0742*** (0.0105)	0.0649*** (0.0101)	0.0566*** (0.00948)	0.0563*** (0.00926)
trough#fin_crisis	-0.0178 (0.230)	-0.0947 (0.219)	0.156 (0.234)	-0.120 (0.267)	0.417 (0.279)	0.700** (0.311)	0.744** (0.358)	0.642 (0.394)	-0.0662 (0.420)	0.252 (0.514)
coord	-0.0406 (0.0360)	-0.0590* (0.0343)	-0.0914** (0.0366)	-0.103** (0.0416)	-0.114*** (0.0418)	-0.128*** (0.0450)	-0.155*** (0.0473)	-0.179*** (0.0503)	-0.181*** (0.0511)	-0.194*** (0.0538)
Observations	1,414	1,403	1,392	1,381	1,370	1,362	1,355	1,348	1,340	1,333
R-squared	0.026	0.044	0.069	0.093	0.119	0.138	0.150	0.163	0.182	0.200
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

No interactions

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Financial crisis	-0.104*** (0.0361)	-0.143** (0.0561)	-0.159** (0.0705)	-0.224*** (0.0863)	-0.306*** (0.103)	-0.378*** (0.118)	-0.451*** (0.132)	-0.565*** (0.146)	-0.607*** (0.159)	-0.654*** (0.171)
GDP growth L2	0.0699*** (0.0117)	0.201*** (0.0128)	0.308*** (0.0119)	0.354*** (0.0116)	0.387*** (0.0118)	0.415*** (0.0122)	0.431*** (0.0125)	0.435*** (0.0128)	0.439*** (0.0131)	0.436*** (0.0134)
i quarters after trough	-0.278*** (0.0428)	-0.0933 (0.0681)	0.126 (0.0830)	0.0482 (0.101)	0.0805 (0.123)	0.0646 (0.145)	0.163 (0.173)	0.202 (0.212)	0.345 (0.243)	0.321 (0.281)
coord	0.0406** (0.0162)	0.0760*** (0.0252)	0.104*** (0.0316)	0.136*** (0.0387)	0.175*** (0.0461)	0.211*** (0.0531)	0.255*** (0.0593)	0.297*** (0.0658)	0.341*** (0.0716)	0.394*** (0.0774)
Observations	1,663	1,650	1,637	1,627	1,619	1,609	1,600	1,591	1,579	1,565
R-squared	0.083	0.184	0.331	0.405	0.447	0.478	0.500	0.510	0.521	0.526
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Hours worked in the recovery

VARIABLES	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	0.0128 (0.0870)	0.0350 (0.0831)	0.122 (0.0889)	0.204** (0.102)	0.248** (0.103)	0.289*** (0.111)	0.338*** (0.117)	0.322** (0.125)	0.325*** (0.126)	0.360*** (0.132)
gdp L2	0.0117 (0.0263)	-0.0101 (0.0176)	0.0234* (0.0138)	0.0383*** (0.0126)	0.0402*** (0.0108)	0.0411*** (0.0104)	0.0412*** (0.00993)	0.0380*** (0.00972)	0.0402*** (0.00915)	0.0401*** (0.00906)
i quarters after trough	0.0577 (0.0975)	-0.0947 (0.0953)	0.216** (0.0988)	0.0615 (0.114)	0.197* (0.117)	0.266** (0.130)	0.0578 (0.146)	0.261 (0.167)	0.417** (0.176)	0.342* (0.200)
coord	-0.0349 (0.0363)	-0.0509 (0.0346)	-0.0853** (0.0370)	-0.0930** (0.0424)	-0.107** (0.0426)	-0.121*** (0.0460)	-0.149*** (0.0484)	-0.172*** (0.0513)	-0.183*** (0.0517)	-0.192*** (0.0546)
Observations	1,394	1,383	1,372	1,364	1,357	1,350	1,343	1,336	1,327	1,318
R-squared	0.021	0.037	0.057	0.071	0.095	0.114	0.126	0.144	0.174	0.192
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Total Hours

VARIABLES	Hours worked in the recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Fin crisis	-0.128 (0.100)	-0.222** (0.109)	-0.255** (0.123)	-0.259* (0.148)	-0.436*** (0.160)	-0.549*** (0.177)	-0.592*** (0.191)	-0.743*** (0.207)	-0.766*** (0.214)	-0.812*** (0.224)
gdp L2	0.0961*** (0.0292)	0.216*** (0.0223)	0.357*** (0.0184)	0.422*** (0.0176)	0.460*** (0.0163)	0.493*** (0.0160)	0.514*** (0.0158)	0.523*** (0.0157)	0.537*** (0.0152)	0.542*** (0.0152)
trough#fin_crisis_cycle	-0.101 (0.257)	-0.188 (0.279)	0.0525 (0.313)	-0.149 (0.379)	0.701 (0.427)	1.160** (0.486)	1.246** (0.578)	1.425** (0.647)	0.750 (0.703)	1.280 (0.864)
coord	0.0567 (0.0401)	0.109** (0.0437)	0.133*** (0.0492)	0.187*** (0.0592)	0.240*** (0.0643)	0.283*** (0.0708)	0.326*** (0.0768)	0.378*** (0.0831)	0.423*** (0.0860)	0.488*** (0.0913)
Observations	1,394	1,383	1,372	1,364	1,357	1,350	1,343	1,336	1,327	1,318
R-squared	0.025	0.109	0.253	0.336	0.421	0.475	0.510	0.531	0.568	0.579
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

During the recession I

Employment rate during the recession	
VARIABLES	(1) peak to trough growth rate of the employment rate
1 is there was a fin crisis episode between peak and trough	-0.986*** (0.109)
peak to trough growth rate	0.392*** (0.0106)
gdp_peak_trough_sq	-0.0232*** (0.000758)
empl rate at previous peak	-0.215*** (0.0131)
coord	0.253*** (0.0495)
Observations	2,896
R-squared	0.534
decade trend	yes
base empl rate level	yes
country FE	yes
restrict to recoveries	yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Hours worked during the recession

VARIABLES	(1) peak to trough growth rate of hours worked
1 is there was a fin crisis episode between peak and trough	-0.219** (0.0922)
peak to trough growth rate	0.0314*** (0.00817)
gdp_peak_trough_sq	-0.00238*** (0.000563)
hours worked at previous peak	-0.00443*** (0.000398)
coord	-0.172*** (0.0398)
Observations	2,473
R-squared	0.094
decade trend	yes
base hour level	yes
country FE	yes
restrict to recoveries	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Before/After 1990

Before 1990.

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	0.0494 (0.0754)	0.158 (0.115)	0.345** (0.144)	0.512*** (0.176)	0.669*** (0.202)	0.810*** (0.227)	0.954*** (0.251)	1.107*** (0.275)	1.221*** (0.294)	1.401*** (0.31)
GDP = L,	0.0394*** (0.0139)	0.124*** (0.0166)	0.233*** (0.0161)	0.273*** (0.0159)	0.299*** (0.0157)	0.322*** (0.0159)	0.338*** (0.0166)	0.339*** (0.0172)	0.341*** (0.0176)	0.335*** (0.0176)
coord	-0.0248 (0.0195)	-0.0452 (0.0299)	-0.0571 (0.0374)	-0.0712 (0.0459)	-0.0721 (0.0529)	-0.0733 (0.0595)	-0.0539 (0.0662)	-0.0399 (0.0731)	-0.0321 (0.0783)	-0.0191 (0.08)
0b.trough_#0b.fin_crisis_cycle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
1.trough_#1.fin_crisis_cycle	-0.106 (0.180)	-0.260 (0.276)	-0.709** (0.344)	-0.576 (0.422)	-0.562 (0.487)	-0.361 (0.549)	-0.103 (0.612)	0.338 (0.716)	1.001 (0.820)	0.562 (1.04)
Observations	855	843	831	822	815	807	799	791	781	769
R-squared	0.046	0.102	0.235	0.302	0.355	0.391	0.409	0.415	0.429	0.429
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Hours worked in the recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	-0.0329 (0.178)	0.0139 (0.175)	0.0548 (0.177)	0.0752 (0.194)	0.101 (0.202)	0.0992 (0.210)	0.165 (0.229)	0.193 (0.242)	0.289 (0.226)	0.36 (0.23)
GDP = L,	-0.0241 (0.0321)	-0.0168 (0.0242)	0.0154 (0.0190)	0.0258 (0.0167)	0.0285* (0.0147)	0.0424*** (0.0137)	0.0429*** (0.0138)	0.0451*** (0.0136)	0.0499*** (0.0121)	0.0461 (0.012)
coord	-0.0170 (0.0426)	-0.0239 (0.0419)	-0.0425 (0.0427)	-0.0432 (0.0467)	-0.0555 (0.0484)	-0.0503 (0.0503)	-0.0526 (0.0546)	-0.0594 (0.0576)	-0.0672 (0.0534)	-0.07 (0.057)
0b.trough_#0b.fin_crisis_cycle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
1.trough_#1.fin_crisis_cycle	-0.0217 (0.481)	0.0377 (0.472)	0.183 (0.479)	0.354 (0.524)	0.343 (0.543)	0.396 (0.565)	0.173 (0.613)	0.366 (0.649)	0.00929 (0.605)	0.028 (0.80)
Observations	752	741	730	722	715	708	701	694	686	678
R-squared	0.026	0.034	0.048	0.069	0.093	0.127	0.146	0.183	0.251	0.27
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

For hours worked, significant impact can only be identified after 1990.

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Fin crisis	-0.143*** (0.0513)	-0.222*** (0.0775)	-0.340*** (0.0947)	-0.477*** (0.111)	-0.615*** (0.132)	-0.693*** (0.150)	-0.746*** (0.162)	-0.917*** (0.175)	-0.969*** (0.189)	-1.075*** (0.200)
gdp L2	0.104*** (0.0198)	0.272*** (0.0191)	0.368*** (0.0167)	0.428*** (0.0160)	0.479*** (0.0168)	0.523*** (0.0176)	0.546*** (0.0180)	0.554*** (0.0187)	0.561*** (0.0194)	0.555*** (0.0200)
trough#fin_crisis	-0.0842 (0.126)	0.0248 (0.190)	0.162 (0.233)	0.213 (0.275)	0.363 (0.341)	0.370 (0.396)	-0.00858 (0.489)	0.257 (0.583)	0.280 (0.676)	1.078 (0.809)
coord	0.0475 (0.0461)	0.0764 (0.0692)	0.0978 (0.0841)	0.112 (0.0979)	0.149 (0.116)	0.162 (0.131)	0.149 (0.143)	0.196 (0.155)	0.275* (0.167)	0.390** (0.178)
Observations	808	807	806	805	804	802	801	800	798	796
R-squared	0.121	0.271	0.442	0.548	0.597	0.641	0.677	0.694	0.708	0.716
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	Hours worked in the recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
Fin crisis	-0.0103 (0.119)	0.0387 (0.109)	0.113 (0.118)	0.254* (0.139)	0.247* (0.134)	0.236 (0.147)	0.303** (0.147)	0.354** (0.155)	0.371** (0.160)	0.441*** (0.162)
gdp L2, trough#fin_crisis	0.127*** (0.0448)	0.0320 (0.0263)	0.0666*** (0.0201)	0.0821*** (0.0189)	0.0740*** (0.0158)	0.0645*** (0.0155)	0.0641*** (0.0142)	0.0601*** (0.0139)	0.0618*** (0.0134)	0.0677*** (0.0128)
coord	-0.115 (0.291)	-0.320 (0.266)	-0.0556 (0.291)	-0.509 (0.344)	0.353 (0.343)	0.686* (0.383)	1.061** (0.430)	0.422 (0.481)	-0.222 (0.519)	-0.164 (0.586)
Observations	642	642	642	642	642	642	642	642	641	640
R-squared	0.102	0.122	0.184	0.218	0.247	0.271	0.289	0.309	0.317	0.341
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

1 observation per cycle

VARIABLES	Employment rate recovery									
	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	-0.194*	-0.313*	-0.456**	-0.455*	-0.435	-0.312	-0.328	-0.103	0.754	0.427
	(0.117)	(0.174)	(0.219)	(0.268)	(0.345)	(0.373)	(0.479)	(0.636)	(0.626)	(0.847)
gdp L2	0.132***	0.167***	0.234***	0.229***	0.270***	0.343***	0.441***	0.385***	0.399***	0.319***
	(0.0353)	(0.0418)	(0.0500)	(0.0551)	(0.0600)	(0.0600)	(0.0770)	(0.0926)	(0.0873)	(0.0955)
coord	0.0922*	0.173**	0.217**	0.323**	0.328**	0.551***	0.430**	0.464	0.312	0.671
	(0.0549)	(0.0789)	(0.103)	(0.130)	(0.151)	(0.181)	(0.216)	(0.291)	(0.285)	(0.407)
Observations	164	163	159	150	142	133	115	92	82	70
R-squared	0.166	0.184	0.231	0.216	0.227	0.318	0.341	0.272	0.330	0.351
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base empl rate level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Hours worked in the recovery

VARIABLES	(1) 1 quarter	(2) 2 quarters	(3) 3 quarters	(4) 4 quarters	(5) 5 quarters	(6) 6 quarters	(7) 7 quarters	(8) 8 quarters	(9) 9 quarters	(10) 10 quarters
fin crisis	-0.110 (0.239)	-0.245 (0.267)	0.103 (0.298)	0.0426 (0.281)	0.398 (0.337)	0.636 (0.382)	0.802* (0.442)	0.195 (0.609)	0.0133 (0.423)	-0.112 (0.577)
gdp L2	-0.0506 (0.0665)	-0.0787 (0.0594)	-0.0412 (0.0633)	-0.132** (0.0516)	-0.0957* (0.0533)	-0.0940 (0.0567)	-0.0677 (0.0647)	-0.147* (0.0873)	-0.109* (0.0579)	-0.133** (0.0652)
coord	-0.0948 (0.106)	-0.0285 (0.113)	-0.0573 (0.132)	-0.0462 (0.124)	-0.0528 (0.138)	-0.231 (0.171)	-0.150 (0.178)	-0.442 (0.270)	-0.294 (0.188)	-0.288 (0.273)
Observations	138	137	134	125	118	109	95	80	72	61
R-squared	0.125	0.103	0.174	0.209	0.234	0.316	0.168	0.272	0.260	0.278
decade trend	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
base hour level	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
restrict to recoveries	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Number of cycles per country

- 12 cycles: CAN
- 11 cycles: AUS, AUT, IRE, NOT
- 10 cycles: FIN, FRA, ITA, JAP, UK, USA
- 9 cycles: GER
- 8 cycles: SWE
- 4 cycles: KOR
- 3 cycles: SPA

List of financial crises with recessions:

- Aus 1989, Aut 2008, Can 1985, Fin 1989, Fra 2008, Ger 1979, Ger 2008, Ire 2008, Jap 1996, Kor 1998, Nor 1992, Spa 2008, Swe 1990, UK 1973, UK 2007, USA 1989, USA 2007

List of observation with financial crisis but no recession

- Fra 1995, Ita 1990, Jap 1990, Jap 2001, Kor 2000, Kor 2002, Nor 1986, UK 1984, UK 1988, UK 1994, UK 1998, USA 1985

List of financial crisis in Laeven and Valencia:

- Aut 2008, Fin 1989, Fra 2008, Ger 2008, Ire 2008, Ita 2008, Jap 1996, Kor 1997, Spa 2008, Swe 1990, Swe 2007, UK 2007, USA 2007

Def:

"A banking crisis is defined as systemic if two conditions are met: 1) Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations) 2) Significant banking policy intervention measures in response to significant losses in the banking system."

Main difference with RR: only if public intervention.

List of financial crisis in Eichengreen and Bordo:

- Fin 1989, Ita 1990, Jap 1990, Kor 1997, Nor 1986, Swe 1990

Def:

"We define financial crises as episodes of financial-market volatility marked by significant problems of illiquidity and insolvency among financial-market participants and/or by official intervention to contain those consequences."

Aim at identifying systemic crises only.

Cycle length:

- average 18 quarters (median 17)
- min 7, max 33

Previously highlighted causes:

- Hoarding
- Productive recessions:
 - Sector shift: Srivastava & Theodore 2005, Burger & Schwartz 2014, Jaimovich & Siu 2015
 - Firm-level productive restructuring: Berger 2012, Petrosky-Nadeau 2013
- Demographic changes: Stock & Watson 2012
- Lack of confidence: Schreft *et al* 2005, Schmitt-Grohé & Uribe 2012

Reject presence of any jobless recovery, argue slow overall recovery: Gali, Smets & Wouters 2012

- Financial accelerator: Bernanke 2009, Bernal-Verdugo *et al* 2013
- Employment direct dependance on credit: Boustanifar 2014, Pagano & Pica 2011, Dromel *et al* 2010, Wasmer & Weil 2004
- Agency cost on credit markets amplify labour market variables: Petrosky-Nadeau 2014
- Absence of collateral on employment: Calvo *et al* 2012

The intensive margin in employment:

- Increasing labour marginal cost (in the hours), sticky wage and firm power lead to over use of hours (Dossche et al 2014)
- Firing and entry cost deter employment and favour hours: Fang & Rogerson 2007
- Growth in hours precedes growth in employment, hiring cost = 1 month of wages: case-study of Denmark: Trapeznikova 2009

↔ Not specific on recessions, even less financial crises.