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Corporate leverage and investment in the aftermath of the financial crisis

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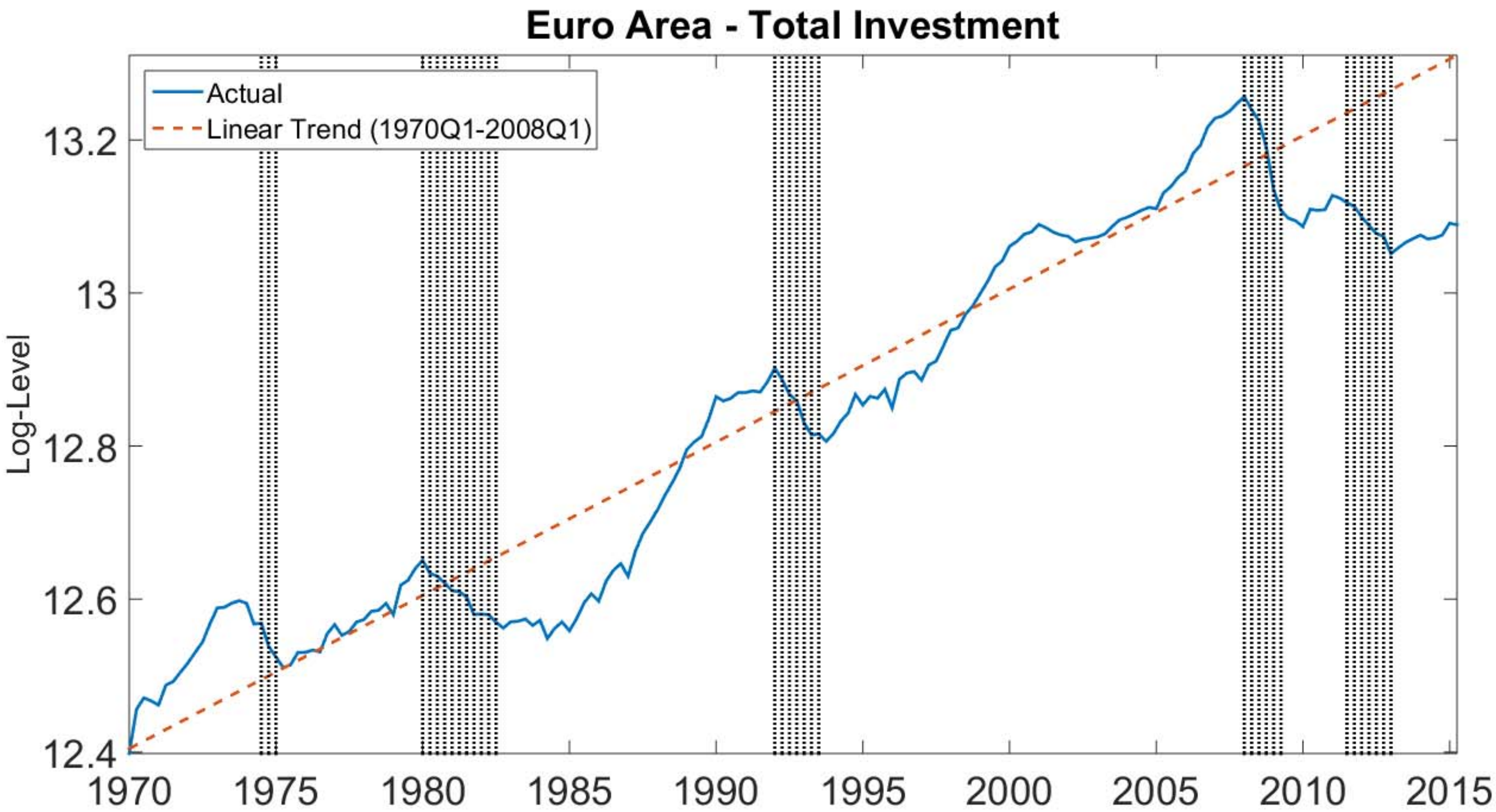
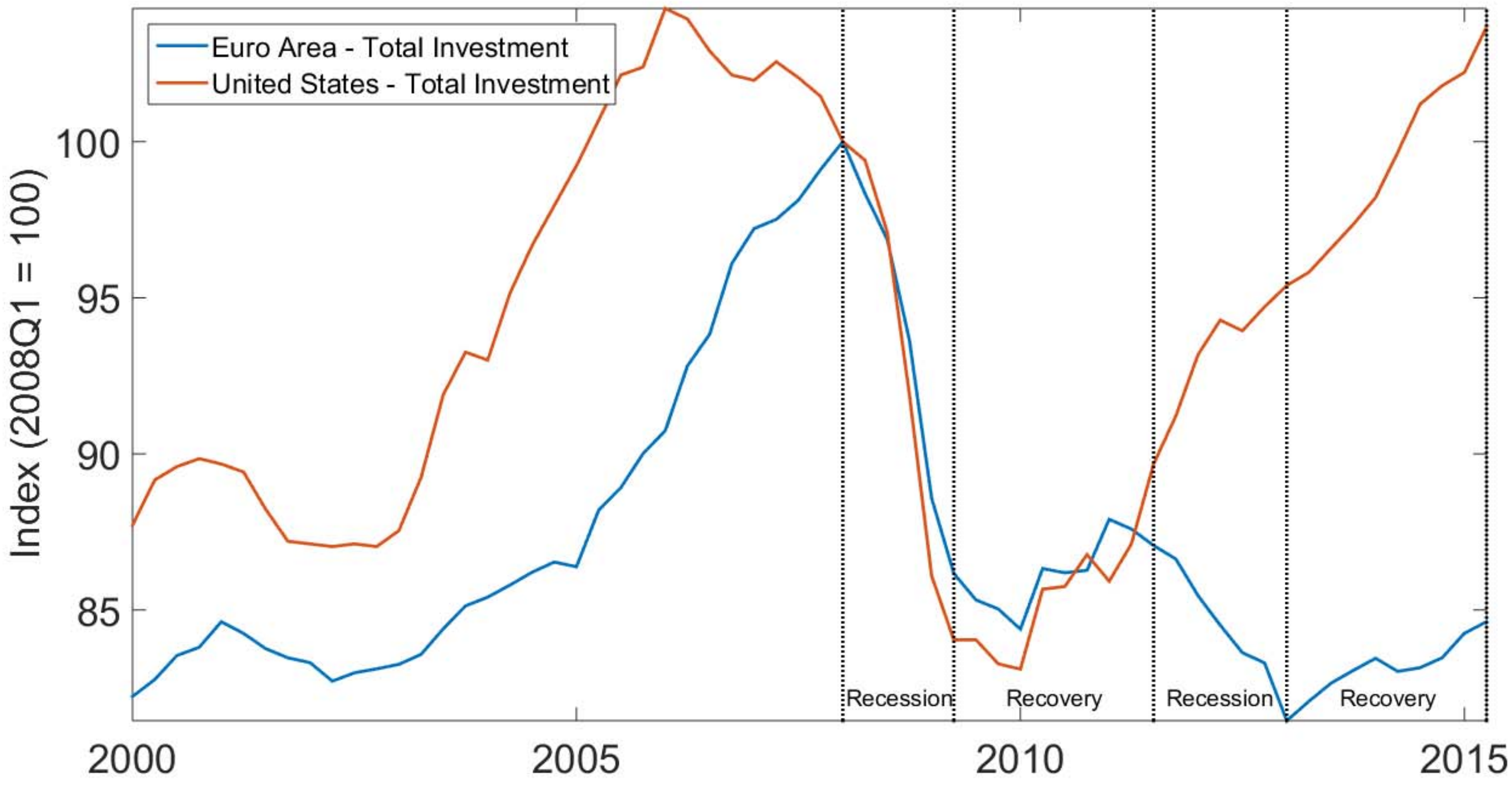
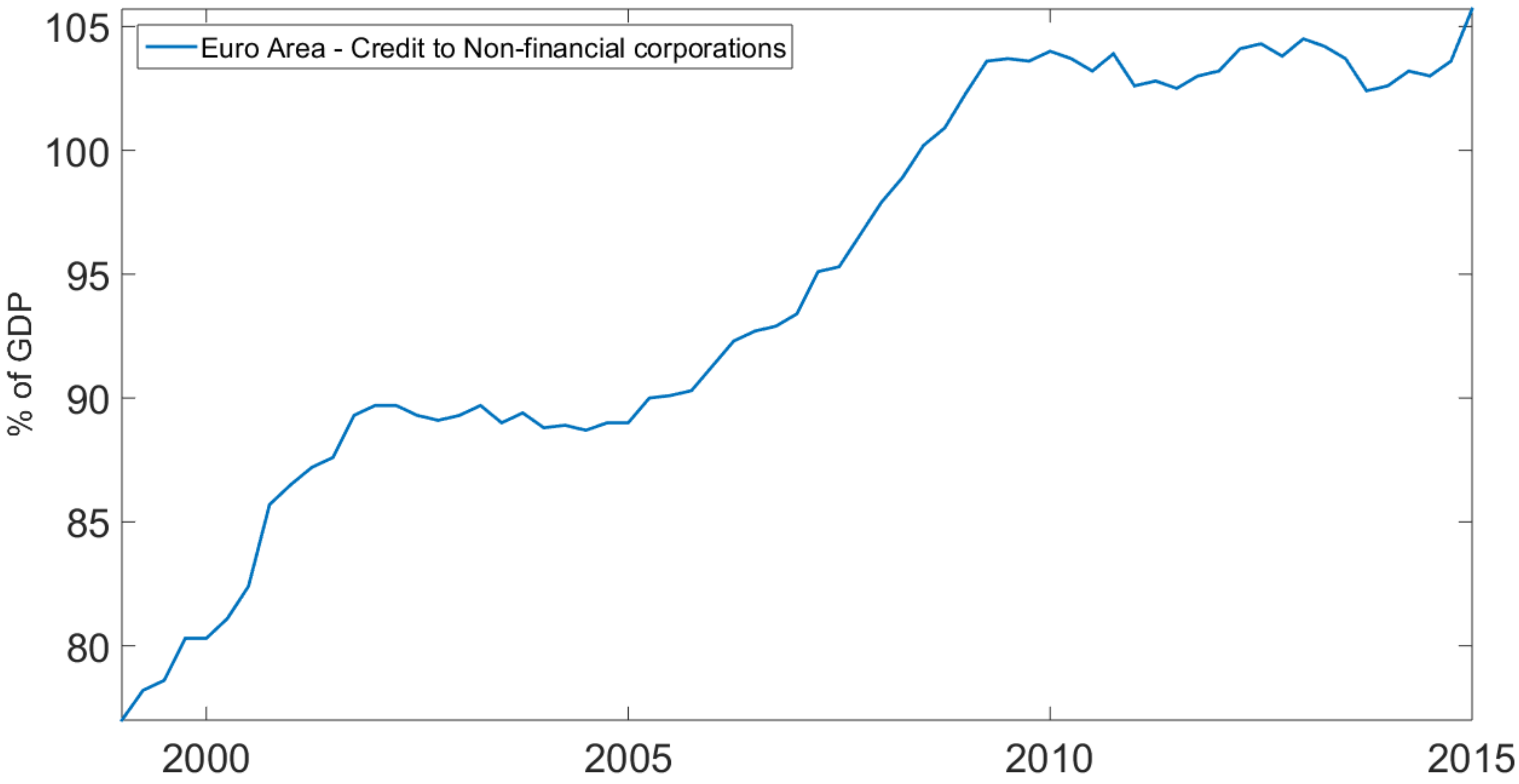
Total investment in the euro area and CEPR recessions



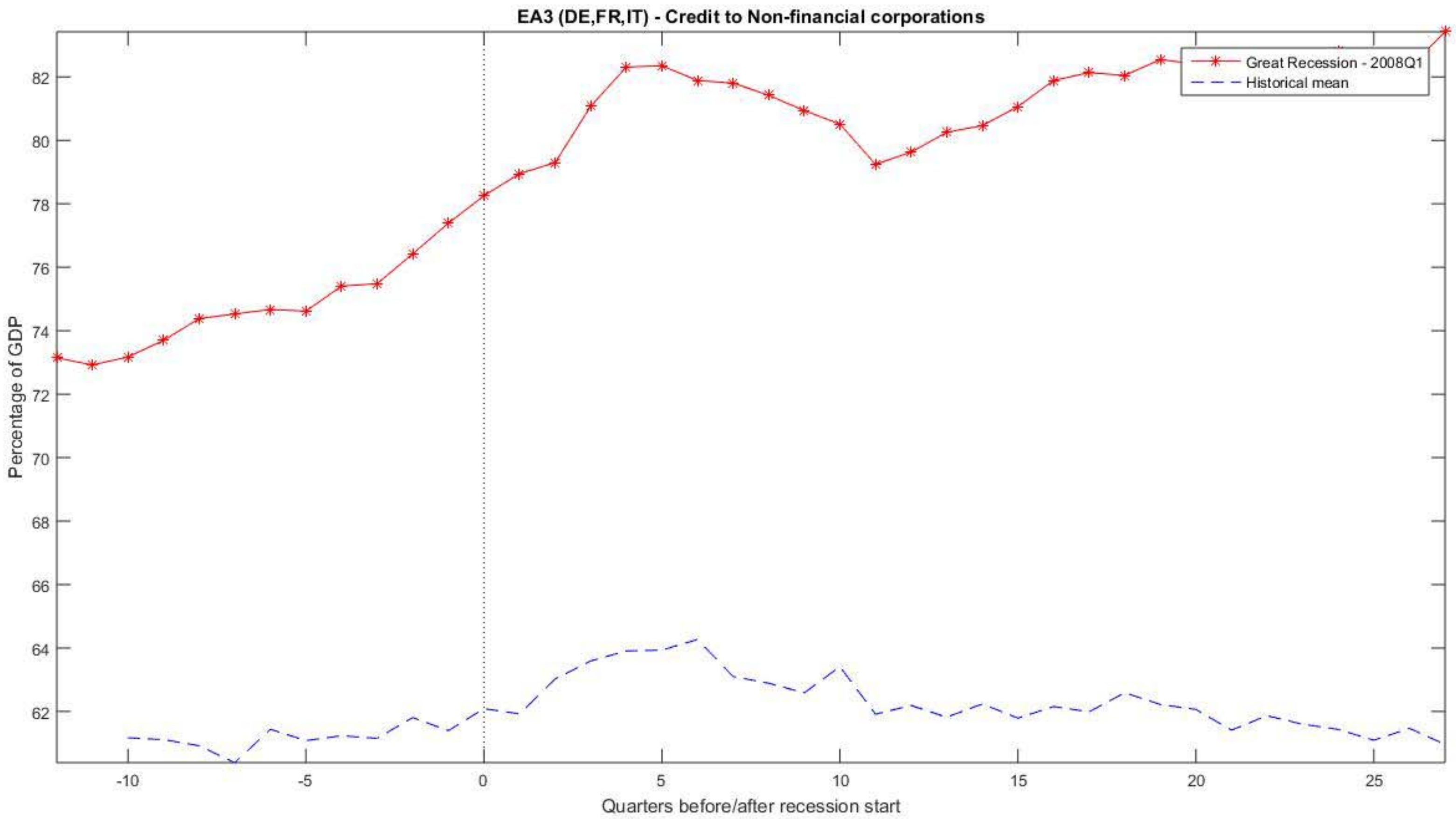
The euro area has experienced two recessions



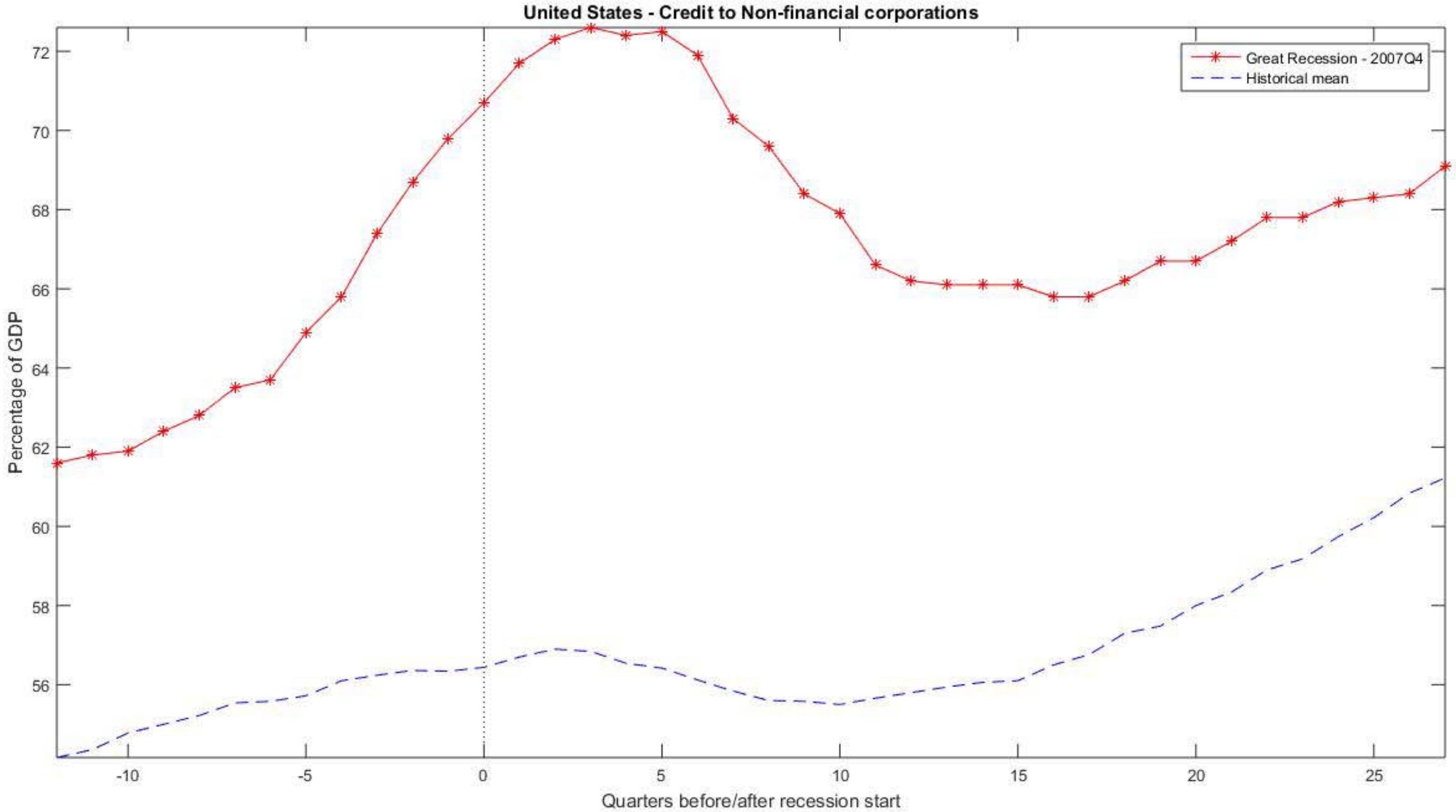
Credit to GDP is high



Credit to GDP is not coming down



Credit to GDP in US has come down



The facts

- Great recession was largest ever for the euro area
- Followed by a second recession: sovereign bond crisis (not in the US)
- Investment since 2008Q1: two recessions followed by recovery
- Two recessions were special: financial recessions
- firm’s entered the great recession with historical high leverage.
- Leverage has not come down very much.

Borrower characteristics that reduced investment (Great recession)

- Financially constrained firms: Campello, Graham and Harvey (2010) , Campello et al. (2011a and b)
- Long term debt maturing during crisis: Almeida et al (2009)
- Low cash reserves, high short term debt, industries that depend on external finance: Duchin, Ozbas & Sensoy (2010)
- Only 1 main lender: Carvalho, Ferreira and Matos (2015)
- Being bank-dependent: Buca and Vermeulen (2015)

Buca and Vermeulen (2015): bank-dependent borrowers reduce investment due to credit tightening in the financial crisis

- New evidence firm side: Euro area wide (6 countries)
- Actual investment outcome data, not surveys
- we construct credit tightening index from ECB Bank lending survey
- A 1st deviation tightening reduces investment of bank-dependent borrowers by 6 to 14 percent relative to non-bank-dependent borrowers.
- crisis coincided with a 1.5 standard deviation tightening of credit.

- Data
- panel of 24 manufacturing industries; 3 size classes;6 countries
- period 2004-2009 annual data
- Annual balance sheet, profit & loss accounts
- Germany, France, Italy, Spain, Belgium, Portugal
- 346 cross-section ; 1884 obs (NxT).
- BACH database

Definitions

•Bank debt leverage= bank debt over total assets

•Total leverage = total debt over total assets

•Bank dependence is higher when firm has higher bank debt leverage

TABLE 2

Variation of bank debt leverage according to country and size

Variable	MEAN	ST.DEV	MINIMUM	MEDIUM	MAXIMUM
BE	14.87	9.38	0.28	13.64	73.14
DE	16.96	8.03	1.20	17.15	38.95
ES	22.74	9.49	0.68	25.13	47.37
FR	10.99	5.25	1.01	10.30	31.42
IT	30.20	8.93	4.40	31.92	46.90
PT	18.56	8.29	0.00	19.67	38.44
SMALL	23.41	9.35	0.82	23.50	57.42
MEDIUM	20.00	9.83	0.02	18.45	46.08
LARGE	13.00	9.51	0.00	10.88	73.14

Notes: Variable is *bank debt leverage*$_{it-1}$. Numbers in percentages. Total sample.

TABLE 3

Variation of tightening index according to country

Variable	MEAN	ST.DEV	MINIMUM	MEDIUM	MAXIMUM
BE	0.34	0.21	0.00	0.27	0.72
DE	0.31	0.13	0.17	0.25	0.60
ES	0.36	0.18	0.09	0.34	0.75
FR	0.36	0.16	0.08	0.30	0.68
IT	0.50	0.13	0.32	0.45	0.79
PT	0.59	0.36	0.00	0.59	1.00

Notes: Variable is $T_{l,t-1}$. Index level. Total sample.

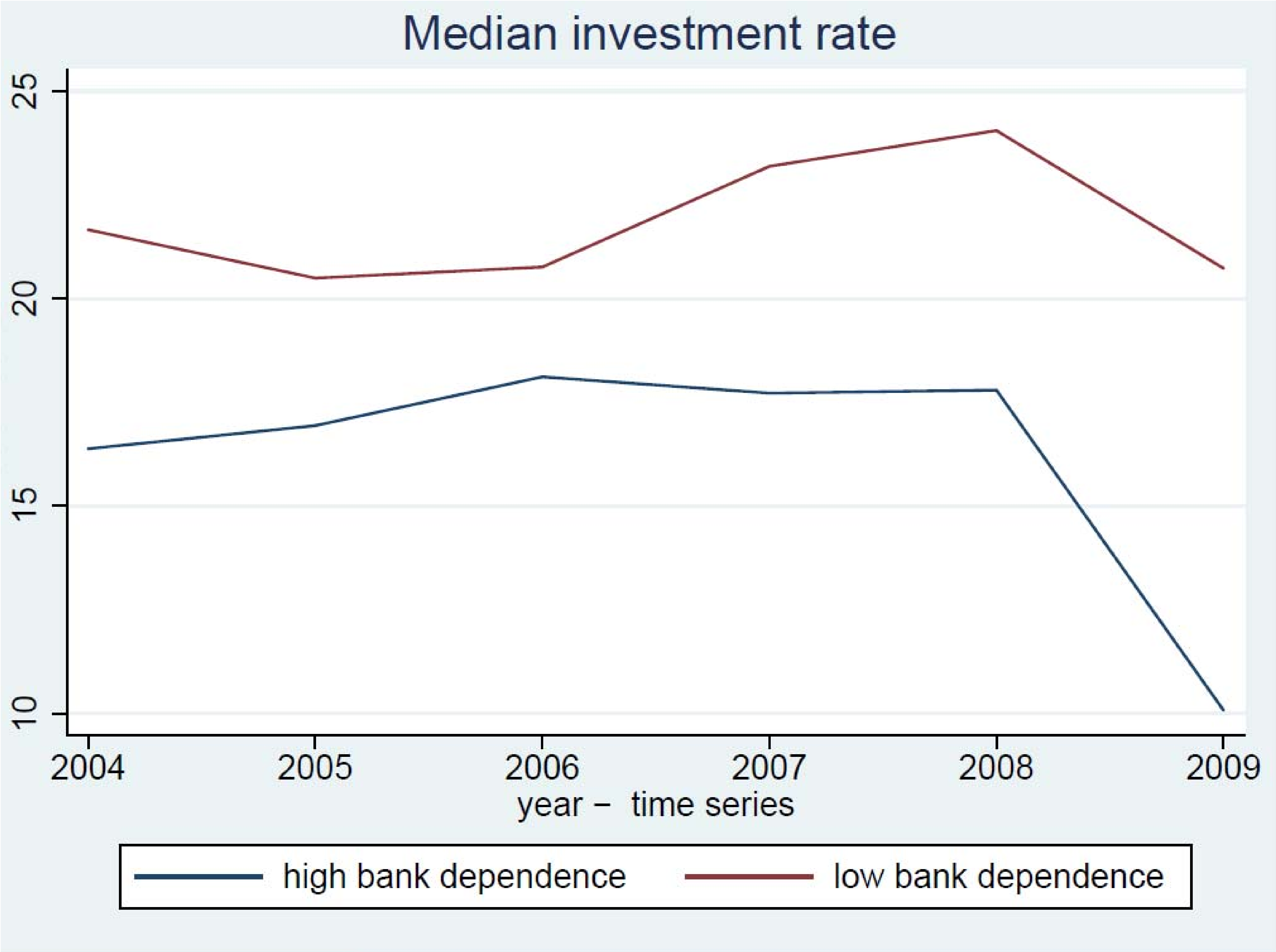
Investment regression: baseline results

Dependent variable is IK_{it}					
		(1)	(2)	(3)	(4)
Variable	coeff.	(1)	(6)	(7)	(9)
T_{lt-1}	θ_T	-2.51	7.24^{***}	4.30^{**}	8.70^{**}
		(2.74)	(2.51)	(2.13)	(2.15)
bank debt lev_{it-1}	θ	0.14^{**}	0.20^{***}	0.04	0.06
		(0.06)	(0.05)	(0.07)	(0.08)
T_{lt-1}**bank debt* lev_{it-1}	θ_{TB}	-0.75^{***}	-0.50^{***}	-0.49^{*}	-0.43^{***}
		(0.14)	(0.11)	(0.10)	(0.11)
country-year dummies		No	yes	no	Yes
fixed effects		No	No	Yes	Yes
Number of Observations		2018	2018	2018	2018

Investment regression: controlling total leverage

		Dependent variable is IK_{it}			
		(1)	(2)	(3)	(4)
Variable	coeff.	OLS	WITHIN	GMM	GMM
IK_{it-1}	β	0.37^{***}	-0.06^{*}	0.15^{***}	0.11^{*}
$\triangle y_{it}$	γ	0.03	0.03	0.23^{***}	0.31^{**}
$(y-k)_{it-1}$	ρ	1.17^{**}	10.19^{***}	9.26	12.83^{*}
CK_{it-1}	λ	0.05^{***}	0.04^{*}	0.03	0.04
bank debt lev$_{it-1}$	θ	0.21^{***}	0.05	0.10	0.44
		(0.05)	(0.10)	(0.18)	(0.29)
T_{jt-1}	θ_T	13.54^{***}	10.51^{**}	19.89^{*}	13.74
		(4.23)	(4.48)	(10.42)	(14.43)
T_{jt-1}**bank debt lev*$_{it-1}$	θ_{TB}	-0.38^{***}	-0.35^{***}	-0.80^{**}	-0.90^{**}
		(0.11)	(0.13)	(0.33)	(0.40)
total lev$_{it-1}$	ϕ_L	0.08^{**}	0.05	0.04	-0.25
		(0.04)	(0.06)	(0.12)	(0.21)
T_{jt}**total lev*$_{it-1}$	ϕ_{TL}	-0.13	-0.05	-0.10	0.04
		(0.09)	(0.09)	(0.19)	(0.29)

- Bank lending survey: banks tightened substantially during financial crisis; but differences across countries.
- bank-dependent borrowers reduced investment as a function of tightening: effects we find are large
- Total leverage has no independent effect: suggests that source of tightening is banks (and not low collateral)
- controlling for demand : strongly suggestive of bank supply effects and not simply a demand story


Median investment rate
25
20
15
10
2004
2005
2006
2007
2008
2009
year – time series
high bank dependence
low bank dependence

Other important factors during the recovery

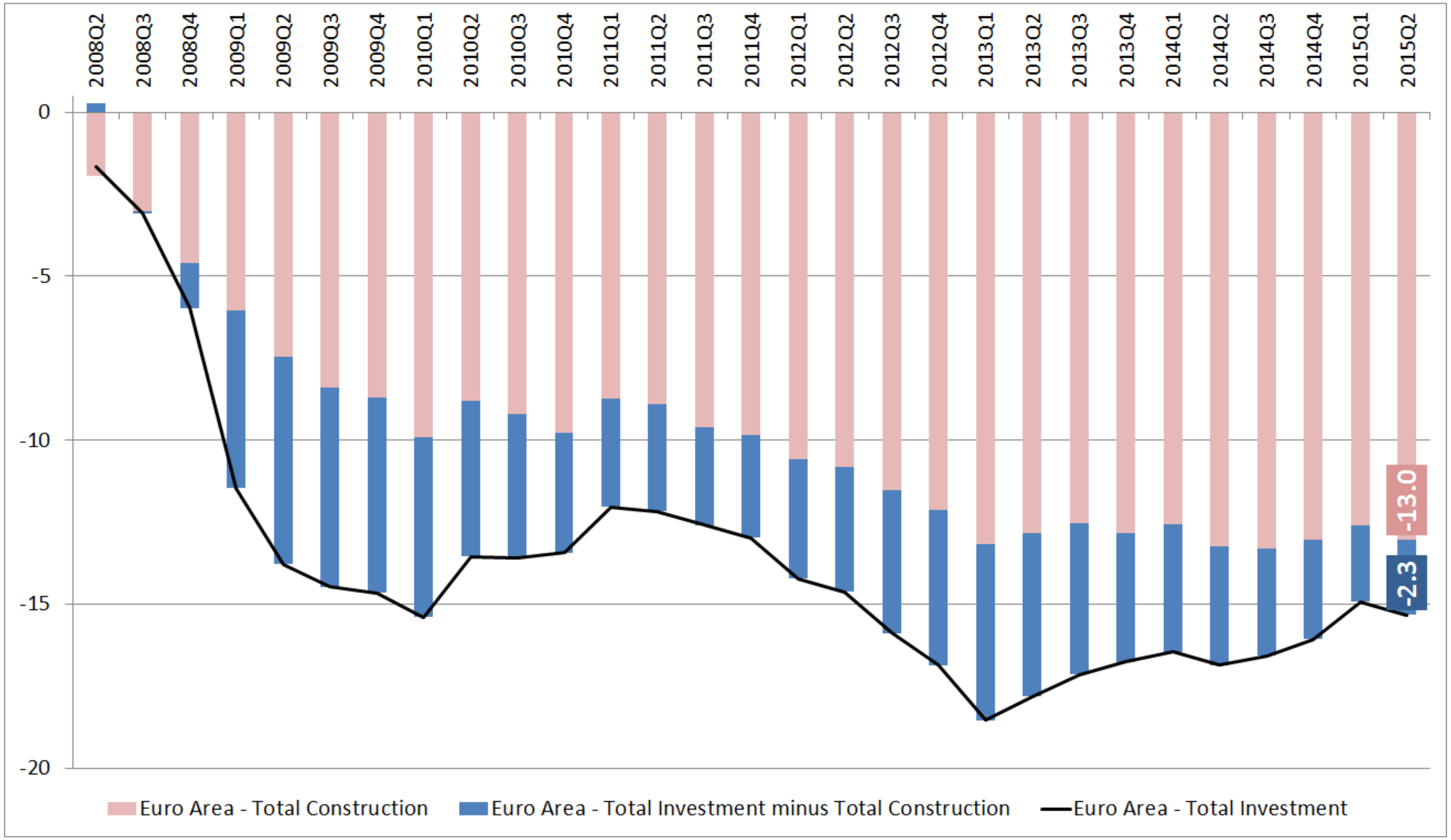
Credit is not the only story

•Construction is still very weak

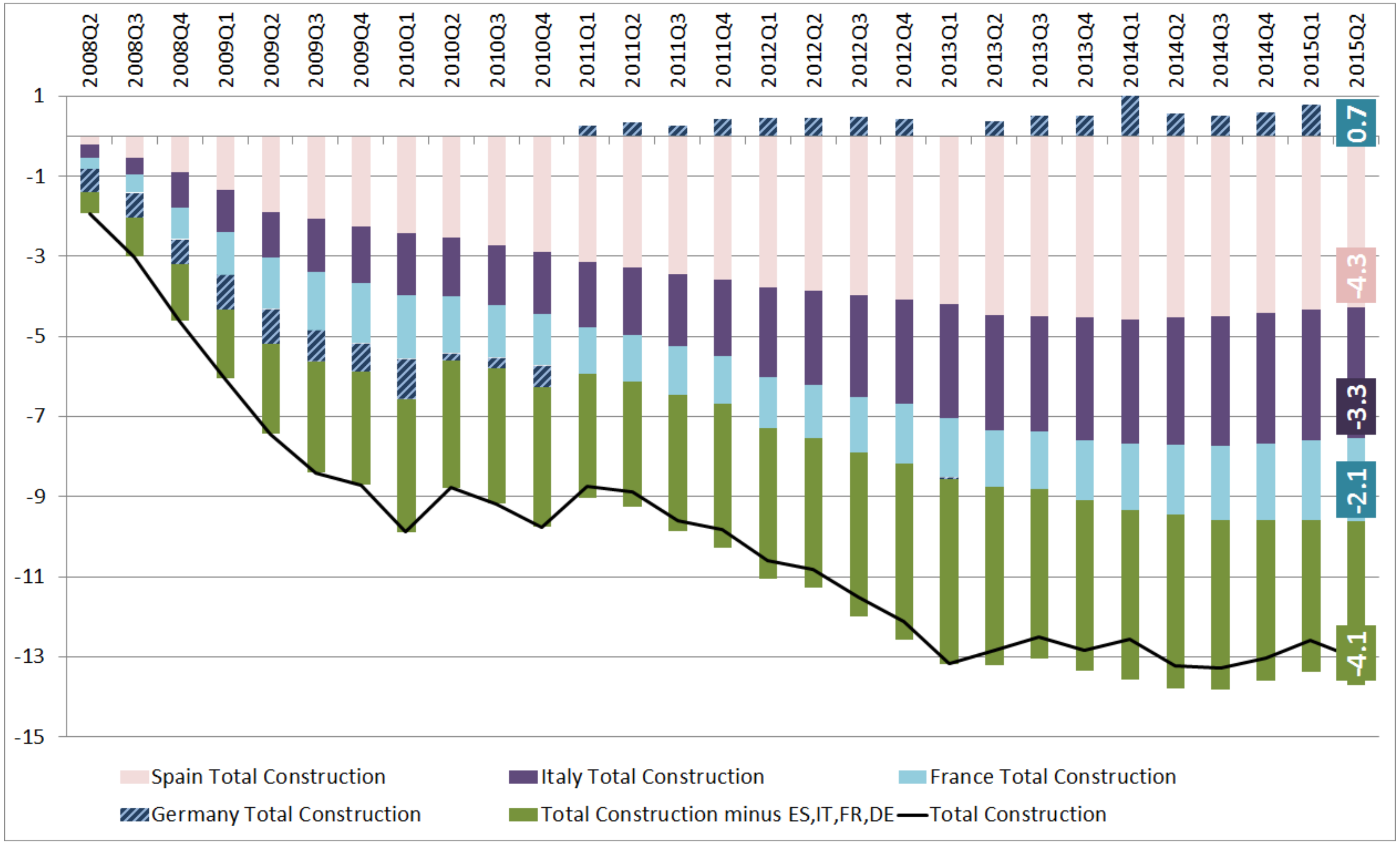
•Aggregate demand is weak

•But: large country heterogeneity

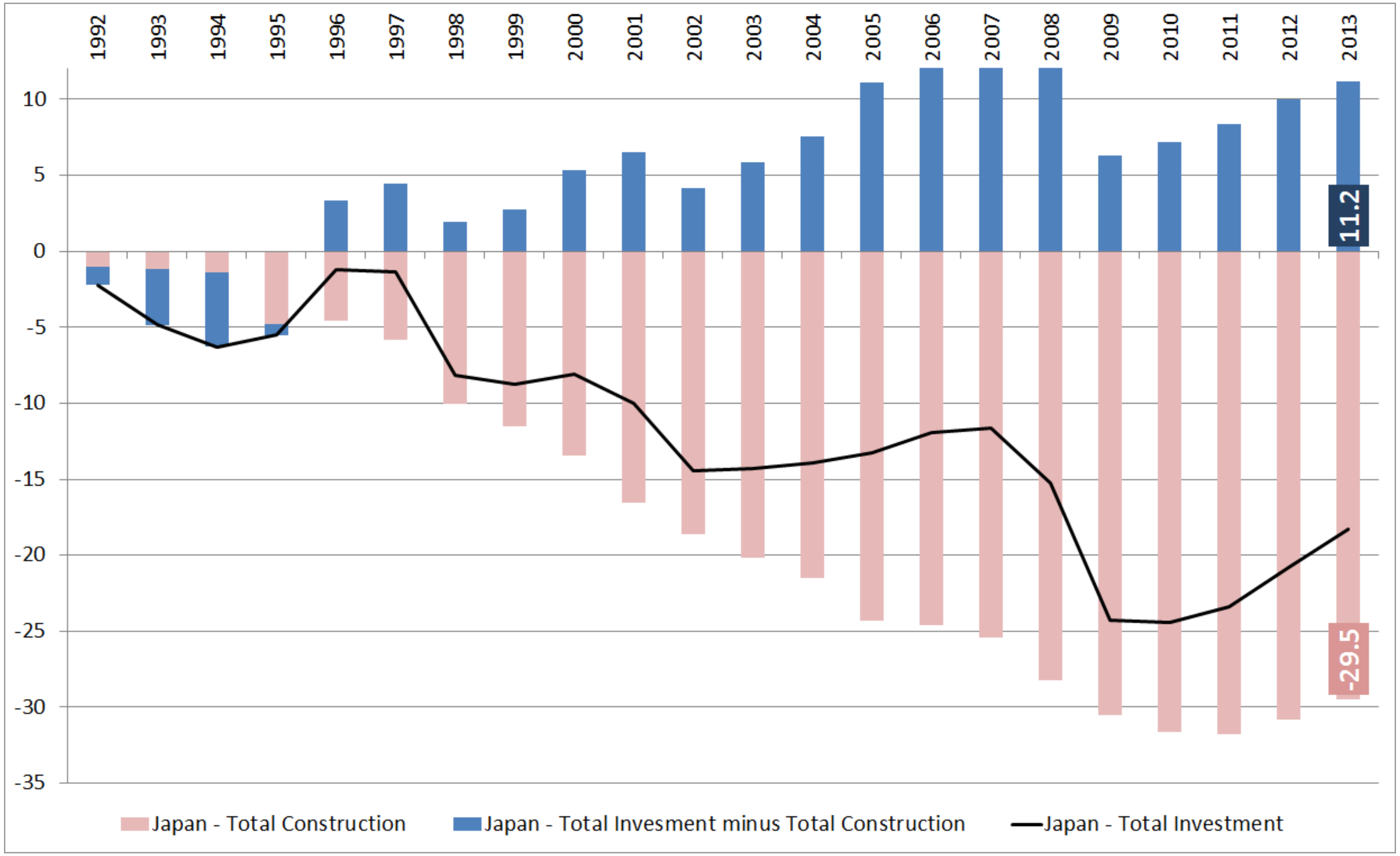
Contribution of construction and non-construction on euro area investment (difference with 2008Q1,pp)



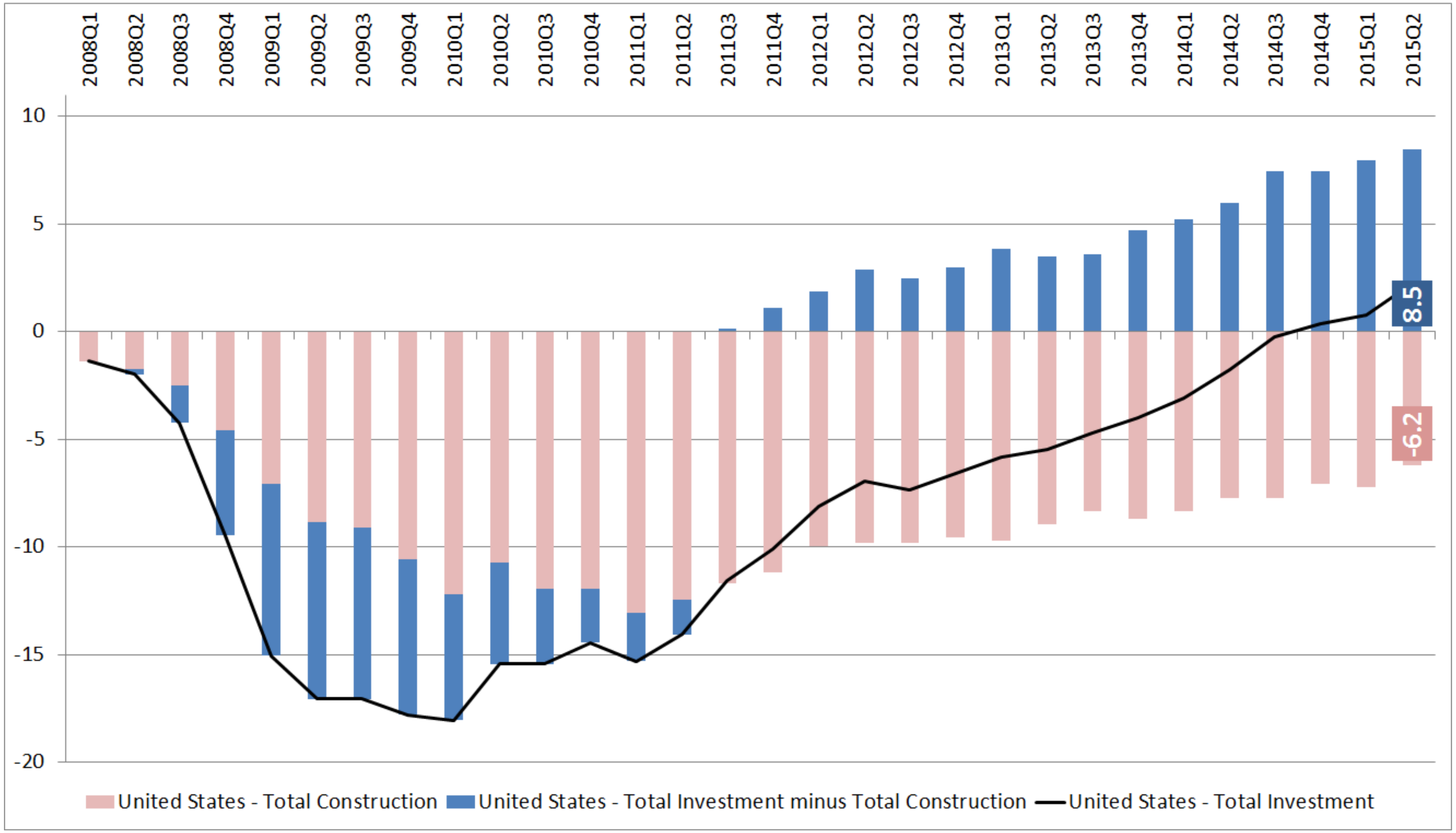
Construction: country differences



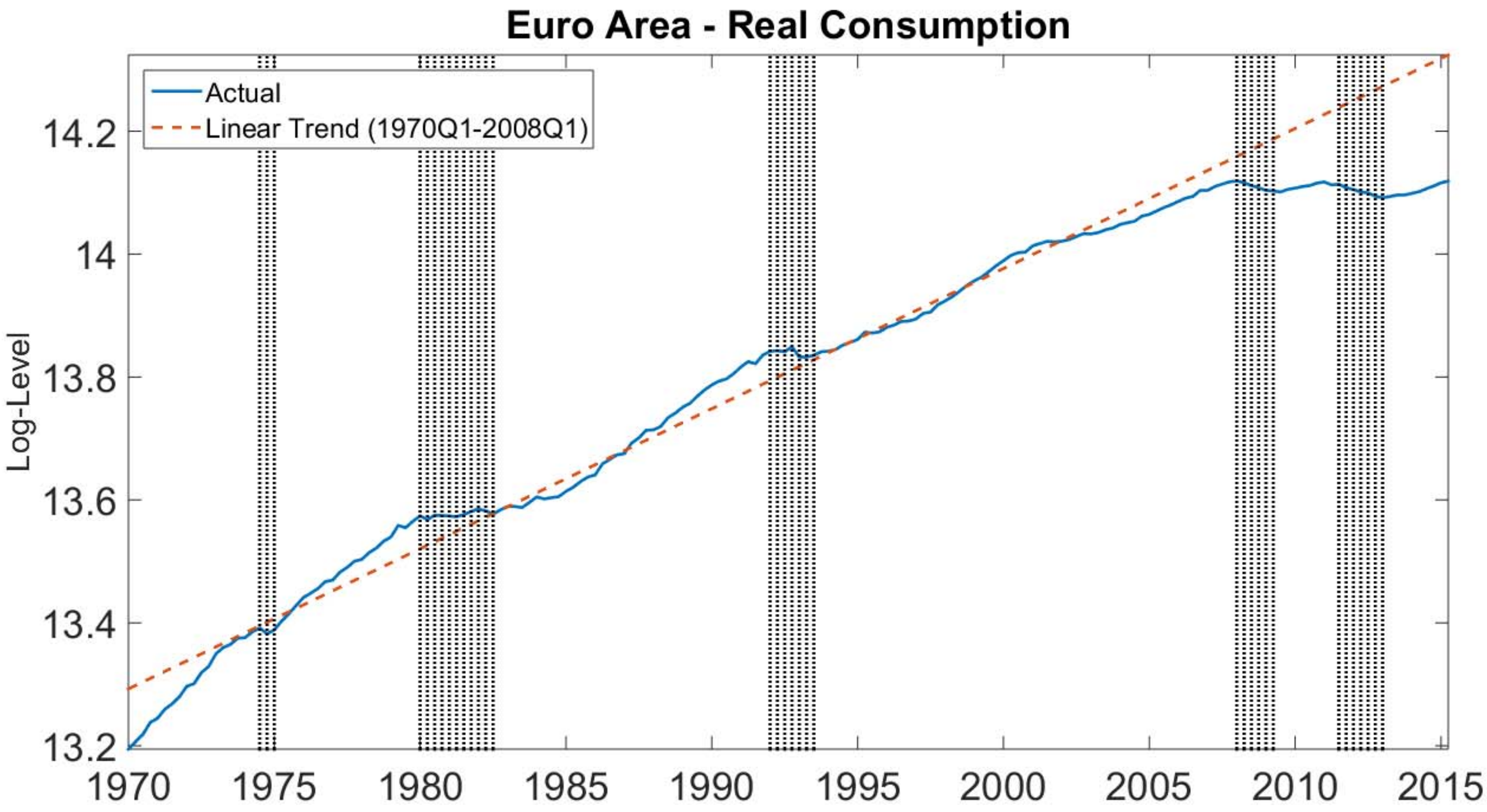
Construction since 1992 Japan: similar story



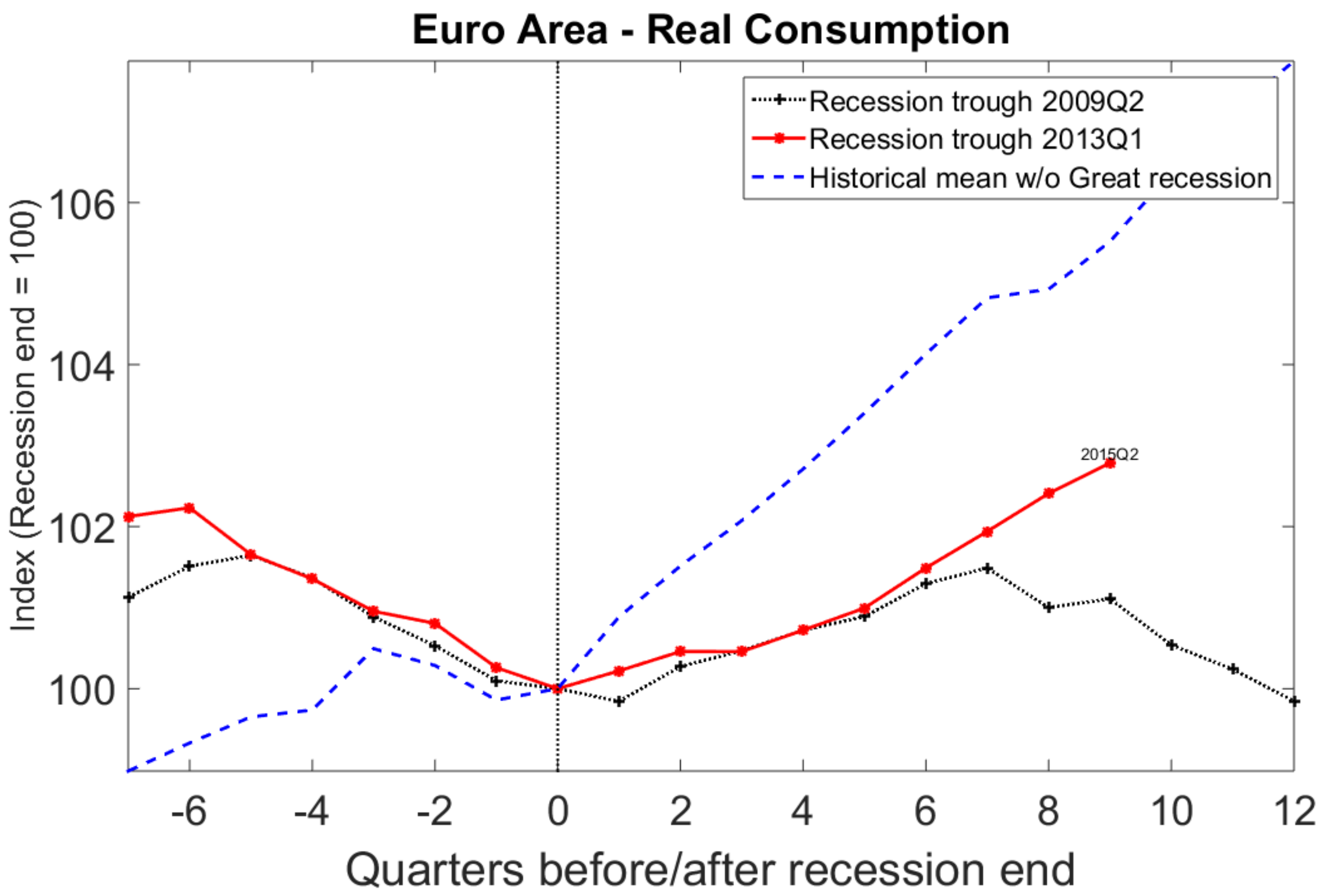
US is doing better



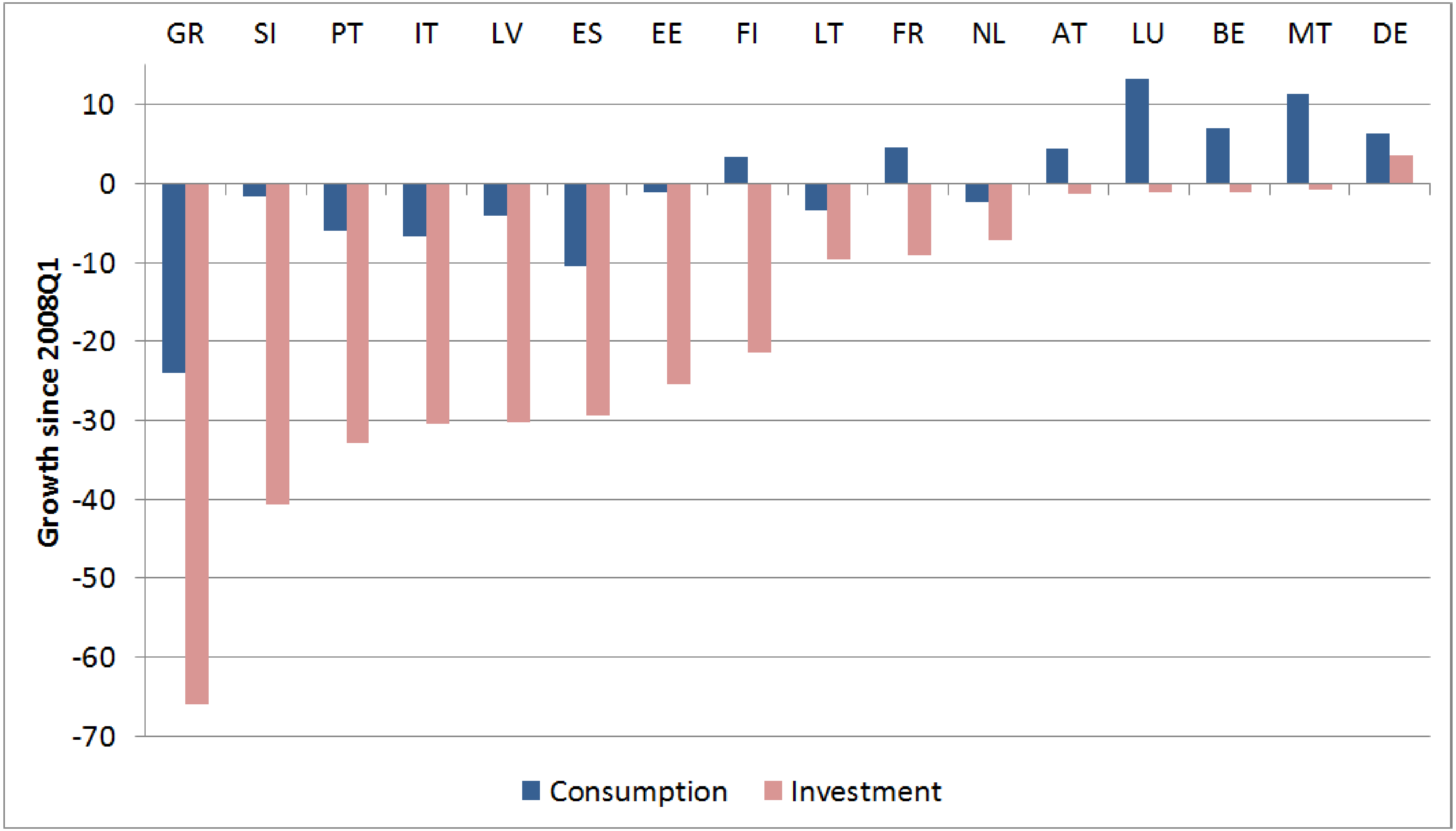
Real consumption in the euro area and CEPR recessions



Also aggregate demand has been disappointing



Country heterogeneity



Conclusion

•Two financial recessions: financing constraints, leverage and bank credit played an important role in determining the magnitude of investment losses during those recessions

•The role of credit fluctuates (recession versus recovery)

Credit is not the complete story

•Construction is still very weak

•Aggregate demand is weak

•Country and industry dimension