The Riskiness of Credit Origins and Downside Risks to Economic Activity

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Background and motivation

- Periods of large aggregate credit expansions are followed by adverse macroeconomic outcomes (Jordà et al. 2011; Mian et al. 2017; etc.)
  - Especially true in an environment of easy financial conditions and buoyant sentiment (Krishnamurthy and Muir 2017; López-Salido et al. 2017; Bordalo et al. 2019; Krishnamurthy and Li 2021)
- Anecdotal evidence suggests that financial institutions driving the credit expansion proved ex-post to have exhibited weaknesses
  - Countrywide and Wamu (U.S.), Spanish saving banks, Anglo-Irish (Ireland), etc.
- Does the origin of credit matter?
  - Traditional models of financial amplification usually consider inter-sectoral heterogeneity but not intra-sectoral heterogeneity
  - Recent models with heterogeneity across lenders suggest that wealth distribution across them matters and that banks with higher risk appetite may expand more during buoyant times (Coimbra and Rey, 2023; Monacelli and Jamilov, 2023).
  - Little to no evidence of such a phenomenon

This paper: Questions

- Does credit origination rotate to riskier banks during large credit expansions?
- Does the riskiness of credit origins (RCO) matter for future macrofinancial performance?
- Through which channels?
  - Asset Quality: A larger fraction of outstanding credit in riskier borrowers
  - Banking Sector Resilience: A larger fraction of outstanding credit in riskier lenders
  - Sentiment: RCO as a measure of (reverting) banking sector/investor sentiment

General results

- Data from $\approx$ 3000 banks across 42 countries and 25 years RCO
- RCO increases during periods of fast aggregate credit expansions (macro and micro)
- RCO predicts future adverse macroeconomic and financial performance
  - Downside risks to economic activity leftward shift in future growth distribution
- RCO is not simply capturing asset quality or banking sector resilience
  - Banking specific sentiment

Related literature: macro

- How do aggregate credit growth, financial conditions, sentiment, and standard aggregate banking soundness indicators relate to macrofinancial outcomes
  - Banking crisis (Gourinchas et al. 2001, Obstfeld 2012, Schularick and Taylor 2012, Dell'Ariccia et al. 2016, Baron and Xiong, 2017; Jordà et al. 2021; Greenwood et al. 2022)
  - Growth-at-risk (Giglio et al. 2016, Adrian et al. 2019, Adrian et al. 2022)
  - Average growth (Greenwood and Hanson, 2013; Kirti, 2021)
  - We focus on the distribution of the origin of domestic bank credit

Related literature: macro

- Bank heterogeneity
  - Aggregate credit growth is more responsive to funding costs when the skewness of the leverage distribution across banks increases (Coimbra and Rey, 2023)
  - Aggregate response to shocks depends on the distribution of bank net worth and leverage (Monacelli and Jamilov, 2023; Goldstein et al. 2023)
  - Empirical evidence from a two-dimensional measure and focus on financial stability outcome variables

Related literature: micro

- Igan and Tamirisa (2008) and Igan and Pinheiro (2011)
  - Weaker banks grow their loan portfolios more slowly than stronger banks in normal times but grow them similarly during credit booms.
- Risk-taking channel of monetary policy (Dell'Ariccia et al. 2017; Jimenez et al., 2014).
  - Looser monetary policy induces banks to take more risk, especially weaker ones
- Faster bank expansions forecast weaker bank performance
  - NPL ratio (Jimenez and Saurina 2006; Chavan and Gambacorta, 2019), loan loss provisions (Foos et al. 2010), stock returns, or return on assets (Fahlenbrach et al. 2018)
- Multi-country environment, unified framework, focus on macro implications

Measuring the Riskiness of Credit Origins

$$RCO_{c,t} = \frac{1}{N_{c,t}^{Top}} \sum_{i \in Top_{c,t}} Risk(decile)_{i,c,t-1} - \frac{1}{N_{c,t}^{Bottom}} \sum_{i \in Bottom_{c,t}} Risk(decile)_{i,c,t-1},$$

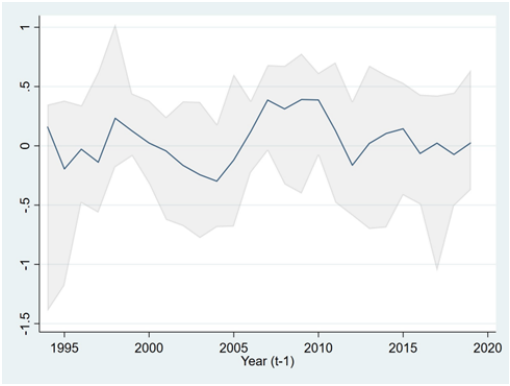
- Greenwood and Hanson (2013)
- $\uparrow RCO \rightarrow$ Banks expanding their loan portfolio relatively faster are becoming relatively riskier
  - RCO increases by 1 $\rightarrow$ top lenders' riskiness is (on average) one decile greater than bottom lenders' riskiness (indicator is demeaned within a country)
  - RCO measures only relative tilt of credit activity expansion within a country
- Two measures of bank riskiness:
  - Z-score distance to default (sign reversed so that higher is riskier) $Z = \frac{(ROAA + LEVERAGE)}{\sigma(ROAA)}$
  - Synthetic risk measure = predicted probability of bank default based on bank fundamentals

Data and sample

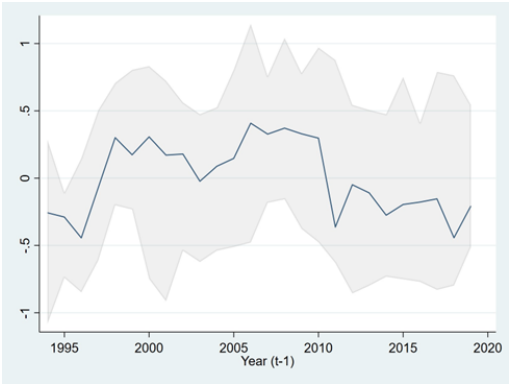
- Main data sources:
  - FitchConnect (two vintages, 2018 and 2021)
  - Banks' EDF data from Moody's Credit Edge
  - Syndicated loan origination from Dealogic matched with FitchConnect
  - Macrofinancial data mainly from IMF IFS
- Minimum requirements for bank and country inclusion in the sample
  - Drop small banks and banks with short histories: $<$ 0.5% of a country's largest bank and at least 5 annual observations
  - Include only country-years with at least 10 banks and countries with at least 5 valid cross-sections
- 39,070 bank-year observations from 3,071 banks in 42 countries from 1990 to 2019.
  - Alternative, more restrictive sample requires a minimum of 20 banks meeting criterion 2 above considered for robustness

Evolution of RCO across countries

(a) RCO (z-score)



(b) RCO (Synthetic EDF)



The Cyclicality of RCO: micro

$$G_{i,c,t} = \beta G_{i,c,t-1} + \gamma_1 Riskiness_{i,c,t-1} + \gamma_2 Riskiness_{i,c,t-1} \times Cycle_{c,t} + \gamma_3' X_{i,c,t-1} + \theta_i + \mu_{c,t} + \varepsilon_{i,c,t}$$

	(1) Loan Growth	(2) Asset Growth	(3) Debt Growth	(4) Equity Growth
Riskiness	-0.348***	-0.379***	-0.459***	0.279***
	(0.035)	(0.034)	(0.039)	(0.044)
Riskiness $\times \Delta$(Credit/GDP)	0.047***	0.038***	0.034***	0.001
	(0.009)	(0.009)	(0.010)	(0.012)
Lagged Dependent Variable	0.129***	0.048***	0.017	-0.066***
	(0.011)	(0.012)	(0.012)	(0.010)
Observations	29,700	29,700	27,353	27,353
R-squared	0.506	0.474	0.460	0.361
Country-Year FE	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y

The Cyclicality of RCO: macro

$$RCO_{c,t+h} = \alpha_{1,h}\Delta(\frac{Credit}{GDP})_{c,t} + \alpha_{2,h}FCI_{c,t} + \alpha_{3,h}Growth_{c,t} + \mu_{c,h} + \xi_{t,h} + \epsilon_{c,t+h}$$

	Baseline				Macro controls			
	(1) h=0	(2) h=1	(3) h=0	(4) h=1	(1) h=0	(2) h=1	(3) h=0	(4) h=1
Real GDP Growth	-0.025	-0.013	-0.027	-0.028	-0.012	0.001	0.013	0.000
	(0.033)	(0.023)	(0.042)	(0.028)	(0.028)	(0.023)	(0.034)	(0.027)
Δ(Credit/GDP)	0.029*	0.051***	0.020	0.043**	0.029*	0.052***	0.018	0.043**
	(0.016)	(0.017)	(0.017)	(0.019)	(0.017)	(0.018)	(0.019)	(0.020)
FCI	0.096*	0.146**	0.166	0.241	0.140**	0.154**	0.260	0.278
	(0.056)	(0.065)	(0.178)	(0.164)	(0.058)	(0.064)	(0.185)	(0.166)
Observations	825	771	825	771	821	767	821	767
No.countries	41	41	41	41	41	41	41	41
Adjusted R2	0.011	0.039	0.011	0.038	0.043	0.041	0.048	0.041
Year FE	N	N	Y	Y	N	N	Y	Y

RCO and Downside Risks to Economic Growth
Empirical Specification

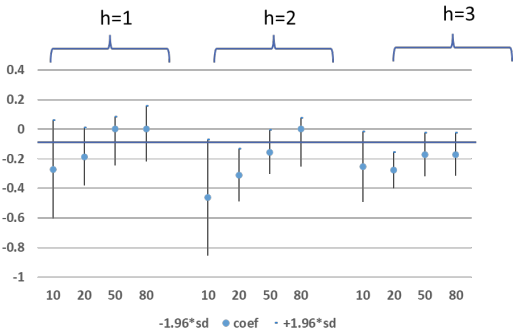
$$Q(\tau, \Delta y_{c,t,h}) = \alpha_{1,h}(\tau)\Delta\left(\frac{Credit}{GDP}\right)_{c,t}^{mv3} + \alpha_{2,h}(\tau)\, FCI_{c,t}^{mv3} + \alpha_{3,h}(\tau) RCO_{c,t}^{mv3} + \alpha_{4,h}(\tau)' X_{c,t}^{mv3} + \mu_{c,h}(\tau) + \varepsilon_{c,t,h}(\tau)$$

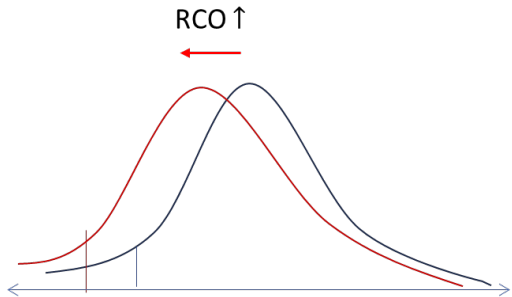
- $\Delta y_{c,t,h} \rightarrow$ average cumulative real GDP growth rate of country
- c from year t to year $t+h$
- $Q(\tau, x) \rightarrow$ percentile τ of variable x.
- $RCO_{c,t}^{mv3} \rightarrow$ 3-year MA of RCO

RCO and Downside Risks to Economic Growth
Baseline Results

	h=1			h=2			h=3		
	τ =20	τ =50	τ =80	τ =20	τ =50	τ =80	τ =20	τ =50	τ =80
Real GDP Growth	0.349***	0.317***	0.406***	0.166*	0.245***	0.322***	0.173**	0.147***	0.221***
	(0.085)	(0.074)	(0.070)	(0.086)	(0.052)	(0.080)	(0.069)	(0.051)	(0.080)
Δ(Credit/GDP)	-0.116***	-0.044*	0.010	-0.121***	-0.077***	-0.038	-0.128***	-0.118***	-0.098***
	(0.026)	(0.023)	(0.026)	(0.023)	(0.021)	(0.027)	(0.020)	(0.025)	(0.027)
FCI	0.441*	0.323*	-0.075	0.768***	0.254*	-0.009	0.440**	0.535***	0.269
	(0.265)	(0.167)	(0.195)	(0.207)	(0.143)	(0.168)	(0.194)	(0.141)	(0.186)
Global FCI	-0.352	-0.640***	-0.317	-1.052***	-0.576***	-0.311	-0.960***	-0.900***	-0.647**
	(0.282)	(0.200)	(0.263)	(0.226)	(0.186)	(0.250)	(0.211)	(0.184)	(0.251)
RCO	-0.186*	-0.082	-0.032	-0.311***	-0.155**	-0.090	-0.278***	-0.173**	-0.171**
	(0.099)	(0.084)	(0.095)	(0.091)	(0.076)	(0.084)	(0.062)	(0.075)	(0.074)
Observations	678	678	678	642	642	642	604	604	604

RCO has a stronger effect on the left tail of GDP distribution





- 1 decile increase in RCO is associated with 0.3 percentage points of growth decline per year at the 20th percentile over a 2- to 3-year horizon
- Robust to controlling for macro conditions, changes in sample, estimation method, riskiness measure (EDF), exclusion of GFC years

RCO and downside risks to asset prices (banking sector)

	h=1				h=2				h=3			
	τ=10	τ=20	τ=50	τ=80	τ=10	τ=20	τ=50	τ=80	τ=10	τ=20	τ=50	τ=80
A. Baseline												
RCO	-4.788**	-2.419	-0.454	0.503	-3.346**	-1.574	-1.420	-2.345	-2.798*	-1.573	-1.437	-3.398**
	(2.359)	(2.129)	(1.876)	(2.137)	(1.382)	(1.159)	(1.024)	(2.164)	(1.440)	(0.994)	(0.960)	(1.389)
Observations	630	630	630	630	630	630	630	630	596	596	596	596
B. Controlling for macro indicators												
RCO	-3.799*	-2.840	0.331	-0.120	-2.319*	-1.363	-0.990	-2.162	-1.739	-1.765*	-2.133**	-1.736
	(2.254)	(2.259)	(1.751)	(2.335)	(1.366)	(1.125)	(1.194)	(1.684)	(1.247)	(1.006)	(0.956)	(1.067)
Observations	591				591				560			

- More salient relationship at the very left side of the distribution
- Stronger results for overall asset prices

Why does RCO predict downside risks?

- Banking sector resilience channel:
  - RCO $\uparrow \rightarrow$ Riskier banks capture a relatively larger share of aggregate credit and debt
  - If riskier banks are less resilient to shocks and borrowers face costs of shifting banks, then aggregate credit and activity may later decline
- Asset quality channel:
  - When riskier banks expand their portfolio, they lend to riskier borrowers
  - RCO $\uparrow \rightarrow$ aggregate asset side of banks' balance sheet becomes riskier
- (Investor/Banking sector) Sentiment channel
  - RCO $\uparrow$ could predict future reversals in investors' or bankers' sentiment associated with tighter standards or financial conditions
- Strategy:
  - Check for micro evidence of these channels
  - Macro: control for future (contemporaneous to GDP distribution measurement) direct proxies of these mechanisms

Resilience channel: micro evidence

$$LG_{i,c,t,h} = \beta_h HLG_{i,c,t} + \gamma_{1,h} Riskiness_{i,c,t-1} + \gamma_{2,h} HLG_{i,c,t} \times Crisis_{c,t+h} + \gamma_{3,h} Riskiness_{i,c,t-1} \times Crisis_{c,t+h} + \theta_{i,h} + \mu_{c,t,h} + \varepsilon_{i,c,t,h}$$

	(1) h=1	(2) h=2	(3) h=3	(4) h=4	(5) h=1	(6) h=2	(7) h=3	(8) h=4
High Loan Growth (HLG)	2.461***	0.425**	-0.118	-0.630***	2.361***	0.365*	-0.228	-0.547**
	(0.174)	(0.167)	(0.186)	(0.188)	(0.201)	(0.199)	(0.216)	(0.231)
Riskiness	-0.224***	-0.107***	-0.069*	-0.010	-0.161***	-0.035	-0.025	0.034
	(0.035)	(0.037)	(0.039)	(0.038)	(0.040)	(0.043)	(0.046)	(0.047)
High Loan Growth X Crisis					0.459	-0.426	-0.477	-1.317***
					(0.432)	(0.458)	(0.471)	(0.484)
RiskinessX Crisis(t+h)					-0.445***	-0.247**	-0.184**	-0.244**
					(0.084)	(0.096)	(0.092)	(0.097)
N	27224	24407	22079	20041	24391	21726	19366	17436
R-squared	0.504	0.511	0.512	0.524	0.515	0.521	0.521	0.535
Country-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y

- Riskier banks tend to contract future lending, especially after adverse shocks
- Similar results (much smaller sample) for EDF

Resilience channel: macro evidence

- Control for: Weighted average (reverse) z-score and skewness of asset-weighted leverage distribution (Coimbra and Rey, 2023).
- Both measured at h=1 (beginning of forecasting horizon)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		h=1			h=2			h=3			h=4	
Leverage Skew	0.631		0.210	1.309		0.993	0.585		-0.290	-2.675		-3.358*
(t+1)	(0.804)		(0.765)	(0.906)		(1.008)	(1.265)		(1.167)	(1.834)		(1.712)
Avg.Riskiness	-0.004***		-0.004***	-0.006***		-0.005***	-0.005***		-0.004***	-0.004***		-0.004***
(t+1)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)
RCO (mv3)		-0.194*	-0.157		-0.302***	-0.304***		-0.299***	-0.224***		-0.247***	-0.267***
		(0.106)	(0.116)		(0.089)	(0.089)		(0.065)	(0.077)		(0.077)	(0.092)
Observations	667	667	667	632	632	632	595	595	595	556	556	556
Standard controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

- Average riskiness matters
- Point estimate declines by 25% at h=3 but does not exhaust predictive power
- Also robust to considering asset-weighted or size based measures of RCO.

Asset Quality: micro evidence

$$AQ_{i,c,t,h} = \beta_h AQ_{i,c,t-1} + \gamma_{1,h} HLG_{i,c,t} + \gamma_{2,h} Riskiness_{i,c,t-1} + \gamma_{3,h} Riskiness_{i,c,t-1} \times HLG_{i,c,t} + \gamma_{4,h}^{'} X_{i,c,t-1} + \theta_{i,c,h} + \mu_{c,t,h} + \varepsilon_{i,c,t,h}$$

	Flow of Loan Loss Provisions			Change in Non-Performing Loans		
	(1)	(2)	(3)	(4)	(5)	(6)
	h=1	h=2	h=3	h=1	h=2	h=3
High Loan Growth (HLG)	-3.064	-1.399	3.525	7.896	3.986	5.129
	(2.297)	(2.189)	(2.281)	(5.081)	(4.245)	(3.785)
Riskiness	-0.705*	-1.322***	-1.333***	-4.694***	-5.280***	-4.895***
	(0.393)	(0.391)	(0.456)	(0.813)	(0.730)	(0.671)
Riskiness X High Loan Growth	0.777*	1.421***	1.401***	3.389***	3.642***	3.412***
	(0.441)	(0.433)	(0.462)	(1.002)	(0.848)	(0.755)
Observations	27,204	23,907	20,919	21,266	18,768	16,751
R-squared	0.746	0.794	0.836	0.375	0.482	0.558
Country-Year FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y
Bank Controls	Y	Y	Y	Y	Y	Y

- Riskier banks tend to de-risk in the future, but less so when they are growing relatively fast

Asset Quality: macro evidence (Speculative Debt)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		h=1			h=2			h=3	
Real GDP Growth	0.218	0.289*	0.295*	0.168	0.103	0.138	0.120	0.107*	0.121*
	(0.166)	(0.153)	(0.152)	(0.114)	(0.115)	(0.093)	(0.079)	(0.061)	(0.063)
Δ(Credit/GDP)	-0.108***	-0.101***	-0.095***	-0.140***	-0.131***	-0.128***	-0.122***	-0.111***	-0.104***
	(0.033)	(0.038)	(0.036)	(0.025)	(0.022)	(0.024)	(0.012)	(0.017)	(0.014)
FCI	0.622*	0.491	0.724**	0.617**	0.703***	0.548**	0.299	0.334**	0.385**
	(0.319)	(0.348)	(0.334)	(0.242)	(0.246)	(0.235)	(0.195)	(0.169)	(0.176)
Global FCI	-0.495	-0.404	-0.466	-1.145***	-1.234***	-1.006***	-0.921***	-0.937***	-0.978***
	(0.335)	(0.356)	(0.359)	(0.315)	(0.286)	(0.286)	(0.221)	(0.197)	(0.184)
ΔSpeculative Debt	-0.014		-0.026	-0.041***		-0.042***	-0.013		-0.015
(t+1)	(0.021)		(0.019)	(0.015)		(0.015)	(0.012)		(0.010)
RCO		-0.255*	-0.274*		-0.340***	-0.334***		-0.229***	-0.270***
		(0.150)	(0.141)		(0.094)	(0.096)		(0.072)	(0.072)
Observations	512	512	512	512	512	512	512	512	512

Asset Quality: macro evidence (RCA)

	(1) h=1	(2)	(3)	(4) h=2	(5)	(6)	(7) h=3	(8)	(9)
Real GDP Growth	0.242***	0.252***	0.195**	0.152*	0.137	0.150**	0.103	0.110**	0.089
	(0.088)	(0.086)	(0.083)	(0.086)	(0.083)	(0.066)	(0.063)	(0.050)	(0.060)
Δ(Credit/GDP)	-0.100**	-0.106***	-0.085*	-0.116***	-0.118***	-0.111***	-0.117***	-0.115***	-0.112***
	(0.042)	(0.034)	(0.044)	(0.025)	(0.022)	(0.022)	(0.016)	(0.017)	(0.018)
FCI	0.627***	0.480**	0.618***	0.698***	0.668***	0.654***	0.397*	0.404**	0.485***
	(0.227)	(0.242)	(0.226)	(0.187)	(0.201)	(0.169)	(0.203)	(0.167)	(0.184)
Global FCI	-0.542*	-0.433	-0.507*	-1.059***	-0.934***	-1.024***	-0.955***	-0.973***	-1.023***
	(0.285)	(0.280)	(0.293)	(0.265)	(0.284)	(0.222)	(0.248)	(0.185)	(0.208)
RCA	-0.453*		-0.404	-0.678***		-0.470*	-0.237		-0.109
	(0.264)		(0.274)	(0.227)		(0.250)	(0.149)		(0.161)
RCO		-0.238**	-0.158		-0.381***	-0.309***		-0.274***	-0.261***
		(0.104)	(0.115)		(0.086)	(0.078)		(0.067)	(0.079)
Observations	636	636	636	603	603	603	568	568	568

Sentiment: RCO predicts reversals in LS and FCI

$$\Delta Y_{c,t+h} = \alpha_{1,h} Y^{mv3}_{c,t} + \alpha_{2,h} RCO^{mv3}_{c,t} + \mu_{c,h} + \zeta_{t,h} + \varepsilon_{c,t,h}$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		h=1			h=2			h=3	
A. Financial Conditions									
RCO	-0.053**		-0.024	-0.050**		-0.024*	-0.021		0.000
	(0.025)		(0.015)	(0.021)		(0.012)	(0.016)		(0.018)
FCI		-0.294***	-0.287***		-0.234***	-0.225***		-0.159***	-0.159***
		(0.032)	(0.031)		(0.027)	(0.027)		(0.022)	(0.026)
Observations	689	689	689	651	651	651	611	611	611
R-squared	0.826	0.846	0.846	0.836	0.848	0.848	0.835	0.840	0.840
B. Lending Standards									
RCO	0.142*		0.115**	0.143*		0.152*	0.061		0.078
	(0.072)		(0.052)	(0.073)		(0.075)	(0.069)		(0.071)
BLS		0.406***	0.399***		-0.084	-0.095		-0.183**	-0.189**
		(0.066)	(0.063)		(0.095)	(0.091)		(0.075)	(0.073)
Observations	379	379	379	349	349	349	320	320	320
R-squared	0.299	0.412	0.420	0.320	0.312	0.327	0.316	0.341	0.345

Sentiment: Controlling for future changes in FCI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		h=1			h=2			h=3	
Real GDP Growth	0.367***	0.349***	0.359***	0.215***	0.166*	0.188**	0.238***	0.173**	0.238***
	(0.089)	(0.085)	(0.080)	(0.080)	(0.088)	(0.087)	(0.065)	(0.070)	(0.066)
Δ(Credit/GDP)	-0.088***	-0.116***	-0.076***	-0.122***	-0.121***	-0.120***	-0.140***	-0.128***	-0.121***
	(0.028)	(0.029)	(0.029)	(0.021)	(0.022)	(0.025)	(0.019)	(0.019)	(0.021)
FCI	0.606***	0.441*	0.619**	0.935***	0.768***	0.923***	0.643***	0.440**	0.573***
	(0.222)	(0.242)	(0.250)	(0.191)	(0.213)	(0.210)	(0.161)	(0.191)	(0.167)
Global FCI	-0.099	-0.352	-0.147	-0.675***	-1.052***	-0.716***	-0.737***	-0.960***	-0.759***
	(0.226)	(0.275)	(0.243)	(0.225)	(0.267)	(0.251)	(0.185)	(0.216)	(0.196)
ΔFCI (h=1)	0.289**		0.299***	0.799***		0.766***	0.540***		0.484***
	(0.117)		(0.110)	(0.110)		(0.110)	(0.109)		(0.098)
RCO		-0.186	-0.134		-0.311***	-0.130		-0.278***	-0.264***
		(0.113)	(0.094)		(0.089)	(0.101)		(0.071)	(0.078)
Observations	678	678	678	642	642	642	604	604	604

- Important declines in RCO predictive power at h=1, 2
- Similar results (smaller sample) controlling for future bank lending standards

Conclusions

- Credit origination tilted toward weaker banks during credit expansions
- The composition of credit origination across heterogeneous banks matters for future economic and financial activity
  - Beyond traditional measures of the size of credit expansions, financial conditions, etc.
- A tilting of credit activity towards riskier banks results in a more vulnerable aggregate balance sheet
  - An increasing fraction of lending by increasingly weaker lenders, less able to deal with the reversals in activity that follow the expansions
  - Bank lending to riskier firms
- Mostly, RCO captures banking-sector and investor sentiment, predicts future reversals and de-risking
- Important to account for lender heterogeneity in theoretical models of the credit cycle

The Riskiness of Credit Origins and Downside Risks to Economic Activity

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