International Spillovers and Local Credit Cycles*

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*This project does not represent official views of the CBRT

Big Picture

Is there any effect of advanced country shocks/policies on emerging market business cycles?

- We use a new and a very big dataset to address an old and policy relevant question:

- How does advanced country shocks/policies transmit to emerging markets?
  $\Rightarrow$ What role capital flows/global financial conditions play in this transmission?

Motivation for the Paper

In Emerging Markets:

- Business cycles correlate strongly with credit cycles
- Capital flows go hand-in-hand with credit cycles
  - $\Rightarrow$ Often resulting in financial crisis
- EM policy makers: "capital flows problem"

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We ask whether:

- Are capital flows *causally* related to domestic credit cycles in EMs?
- If so, what are the mechanisms at work?

Challenges

A basic *identification problem*:

- Relative importance of "pull" or "push" factors for capital flows?

  $\Rightarrow$ Is domestic credit growth being driven by exogenous capital flows, i.e., an exogenous international supply of credit?

- Is there any role for heterogeneous agents?

  $\Rightarrow$ important to shed light on micro-foundations of macro models

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- Evaluate the effect of push-capital flows on lending and borrowing patterns at the firm-bank level
  - Role of funding structure of banks
  - Role of firm/bank risk taking and balance sheet shocks
  - Role of currency denomination of loan: FX vs. TL (Turkish lira)

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  - Role of funding structure of banks
  - Role of firm/bank risk taking and balance sheet shocks
  - Role of currency denomination of loan: FX vs. TL (Turkish lira)
- Literature so far is mixed
  - Many papers on the transmission of VIX/US Policy on global/country specific asset prices; few papers on flow quantities
  - Very little evidence on the effect of "risk-on-flows" on EM real and financial outcomes

Preview of Results

1. Supply ("push") driven capital inflows have a quantitatively important impact on domestic credit cycle
    - An increase in capital flows equivalent to its IQR leads to 1 pp reduction in real borrowing costs (lower in OLS)
    - Supply driven capital inflows explain 43% of *aggregate* corporate sector cyclical credit growth on average

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2. "Good" banks are more procylical
    - Banks with higher non-core liabilities expand more credit and offer lower rates during periods of "risk-on" capital flows
3. "Risky" firms pay relatively lower rates during "risk-on" periods
    - However their borrowing will not exceed that of "non-risky" firms due to collateral constrains

Empirical Literature

1. Push-pull factors: Mostly on *net* capital flows
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3. VIX/US MP and capital flows: Less consensus on US MP
   - Country Level Data (IMF, EPFR): Forbers and Warnock (2012); Fratzscher et al. (2013); Ahmed and Zlate (2014); Cerutti et al. (2016); Chari et al. (2016); Curcuru et al. (2015)
   - Syndicated Loans/Global Banks: Braunning and Ivashina (2016)

Theoretical Literature

1. Supply-Side Flows: Diversification/liquidity allocation as drivers of gross capital flows
    - Obstfeld (2009); Caballero and Simsek (2016); Brunnermeier et al. (2012); Bruno and Shin (2013); Miranda-Agrippino and Rey (2015); Gabaix and Maggiori (2015)

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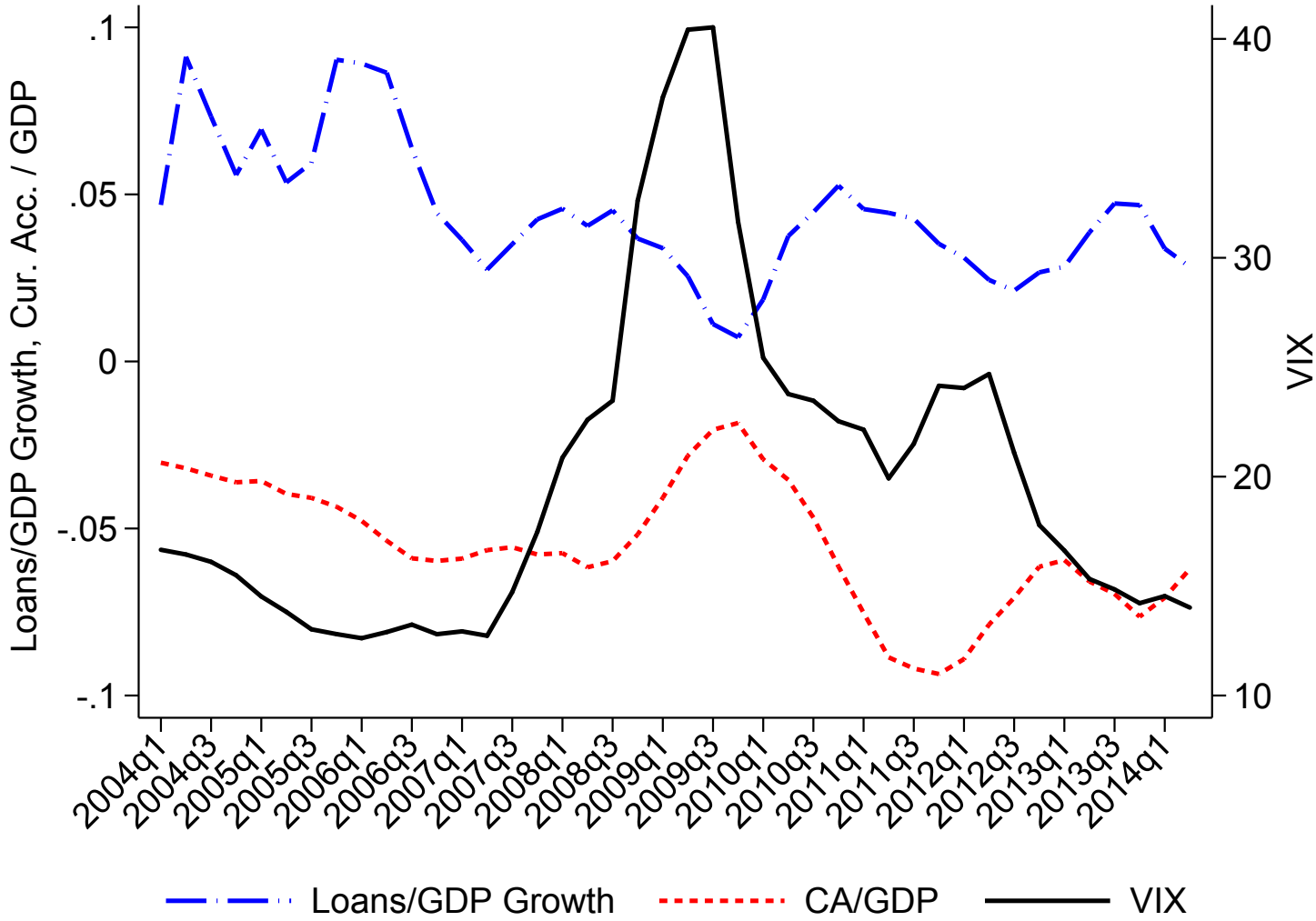
2. Heterogeneity: Bank/firm credit constraints, FX dimension, Capital flow management
    - Holmstorm and Tirole (1997); Fahri and Werning (2015); Gopinath et al. (2017); Aoki et al (2015); Korinek and Davilla (2016); Korinek and Nowak (2015); Caballero and Krishnamurthy (2005, 2006); Korinek (2010); Jeanne and Korinek (2010); Ostry et al. (2010); Brunnermeier and Sannikov (2015); Korinek and Sandri (2016)

VIX, CA/GDP, and Domestic Credit

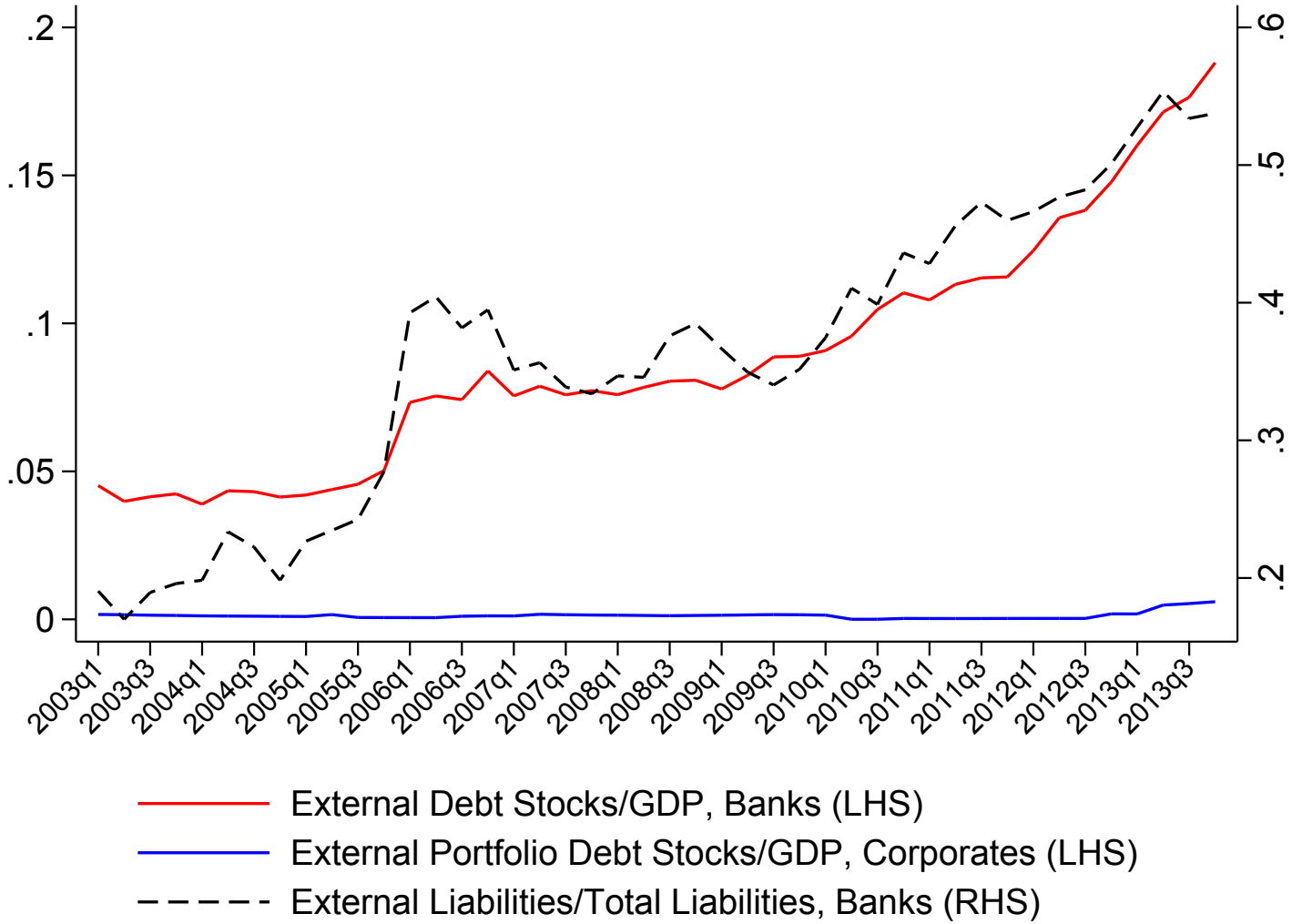
Domestic credit and capital inflows: Demand or Supply Driven? Or Both?



Sources: CBRT

Bank Intermediated External Finance

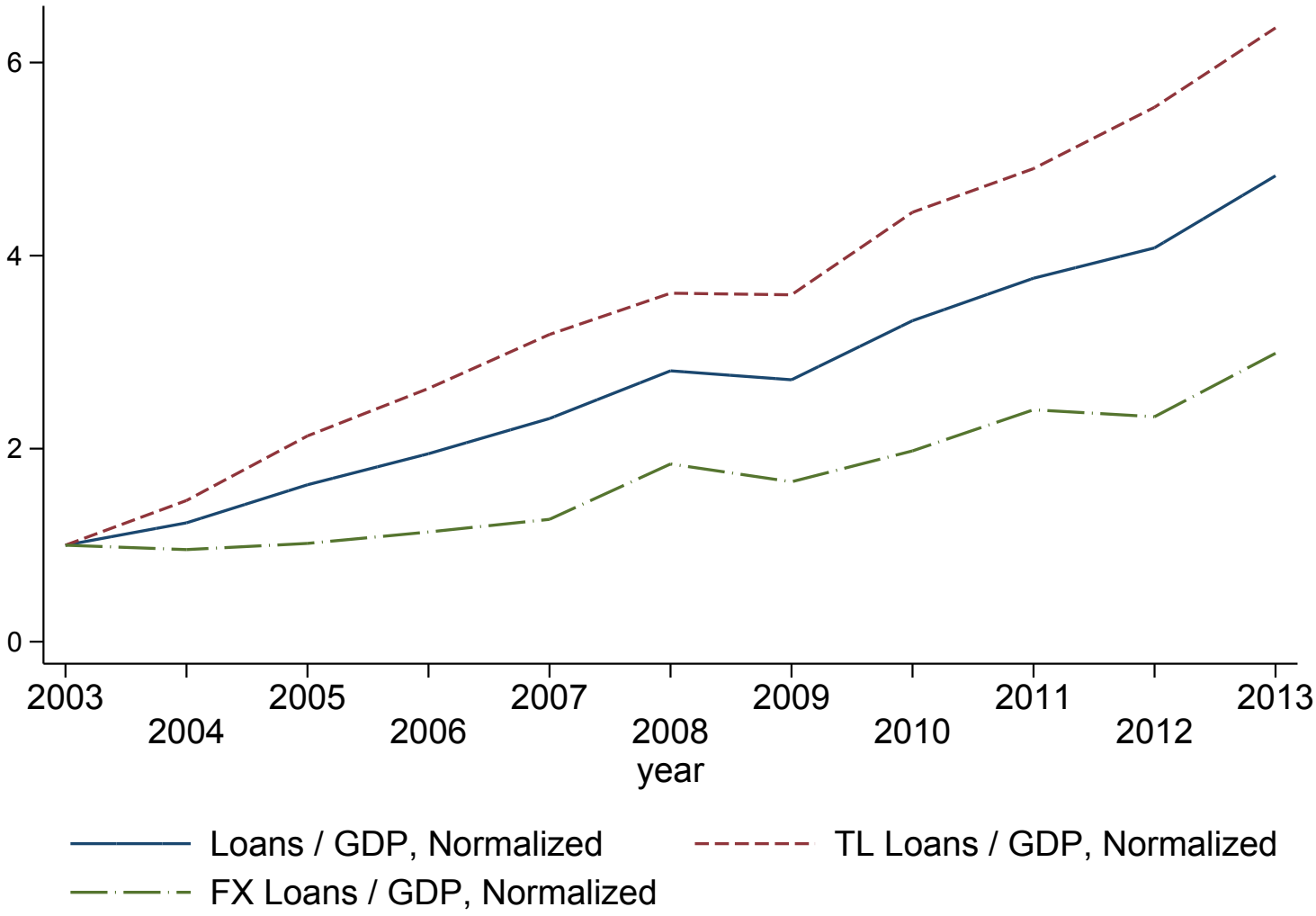
Non-financial corporate sector's external debt issuance is tiny (percent of GDP)



Sources: CBRT

▸ Flows ▸ Stocks ▸ Other EM

FX and TL Loan Growth



Sources: CBRT

Conceptual Framework

- Channel: real borrowing costs decline as a result of exogenous capital flows. Simple framework built on arbitrage condition with time varying risk premium (UIP):

$$i_t = i_t^* + \mathbb{E}_t \Delta e_{t+1} + \gamma_t, \quad \text{where}$$
$$\gamma_t \equiv \omega \text{VIX}_t + \alpha_{c,t}$$

- Then at *firm-bank* level,

$$\gamma_{f,b,t} \equiv \alpha_{f,t}, \quad \text{then}$$
$$i_{f,b,t} = i_t + \gamma_{f,b,t}$$
$$= i_t^* + \mathbb{E}_t(\Delta e_{t+1}) + \omega \text{VIX}_t + \alpha_{c,t} + \alpha_{f,t}$$

- Assuming PPP, we have real equivalent:

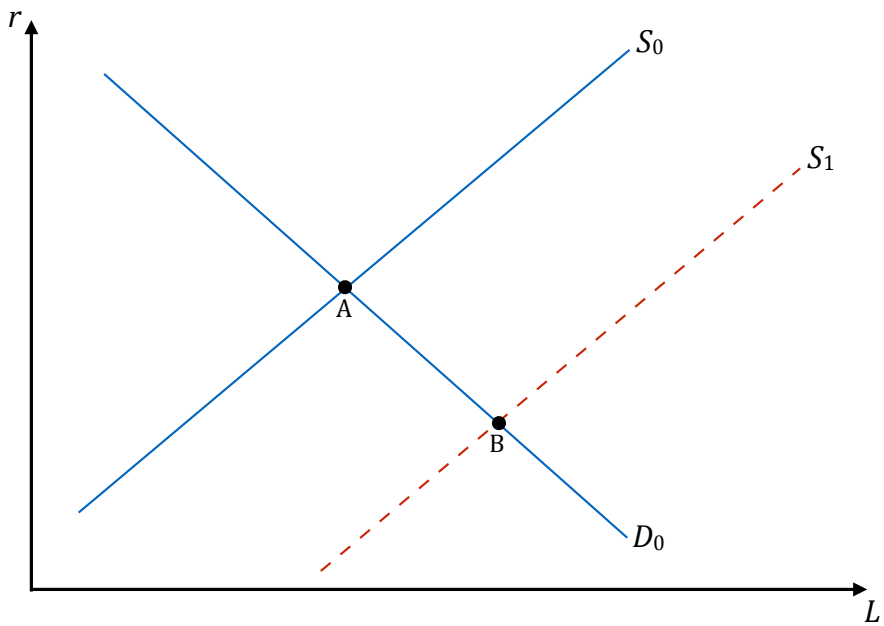
$$r_t = r_t^* + \gamma_t$$
$$r_{f,b,t} = r_t^* + \omega \text{VIX}_t + \alpha_{c,t} + \alpha_{f,t}$$

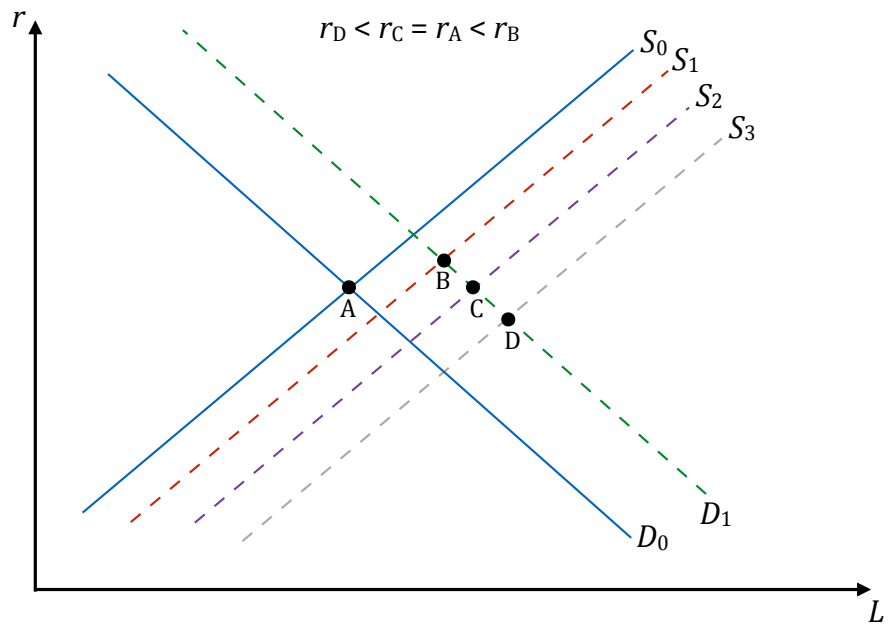
Empirical Strategy: Two-Layer Identification, Layer I

Effect of economy wide supply shock (exogenous capital inflows)

- Analyze impact of an exogenous push factor, VIX, both in IV and reduced form
- Focus on domestic credit variables, both volume (loans) and price for identification
- Include individual time-varying firm and bank variables, and bank×firm fixed effects

Basics of Identification





Layer II: Within Firm Estimator Over a Long Panel

Which banks experience larger supply shock and what is the effect?

- Include individual time-varying firm and bank variables, and bank×firm fixed effects
- Use a within firm estimator via firm×time fixed effects

$\Rightarrow$ Analyze the same firm who borrows from multiple different banks, over time

- ... (Khwaja and Mian, 2008; Jiménez et al., 2014; Chodorow-Reich, 2014)

Data: Merging Three Large Datasets over 2003–13

1. Credit register data has information on universe of loans in economy to households and firms

- Focus on loans to corporate sector ▸ Comparison to whole economy
  - Bank, firm, currency, quarter level: 53+ million loans
  - Loan value, interest rate, maturity, collateral, risk measures
  - Roughly 75% of observations in value are firms with loans from multiple banks (50% in counts, 2.5 bank per firm on average)
  - TL/FX approximately 50-50 split in counts; 40-60 in value
  - Avg TL loan: 18 months maturity, 15%nominal rate, 7%real rate
  - Avg FX loan: 14 months maturity, 7%nominal rate, -1%real rate

Data: Merging Three Large Datasets over 2003–13

2. Regulatory bank data capture the balance sheet items and portfolio items for the universe of banks (45)
   - Banks capture 90 percent of corporate liabilities and 86 percent of country's financial assets ▸ Banks
3. Regulatory survey firm data capture 50 percent of the real economy
   - Annual balance sheet and income statement data ▸ Firms

$\Rightarrow$ Core dataset has all data collapsed to bank-firm- currency-quarter level for 20+ million observations

"Macro" Capital Flows Regressions

$$\log \mathrm{Y}_{f,b,d,q} = \alpha_{f,b} + \lambda \mathit{Trend}_q + \beta \log \text{Capital inflows}_{q-1} + \delta \mathrm{FX}_{f,b,d,q} + \Theta_1 \mathbf{Bank}_{b,q-1} + \Theta_2 \mathbf{Macro}_{q-1} + \varepsilon_{f,b,d,q}, \tag{1}$$

"Macro" Capital Flows Regressions

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- Y: Loan or interest rate (nominal and real) at firm (f)×bank (b)×currency denomination (d)×quarter (q) level
- Capital inflows: Turkish real inflows
  - ⇒ Instrument with VIX
- FX: FX dummy (0 = TL, 1 = FX)
- **Bank**: log(Assets), capital ratio, liquidity ratio, noncore ratio, ROA
- **Macro controls**: GDP growth, inflation, exchange rate change, expectations, policy rate ▸ Turkish policy rate ▸ Macro Variables

Macro Regressions

★ Low VIX/high capital inflow episodes lead to more credit and lower rates

★ IV estimates systematically larger (in absolute value) than OLS

Panel A. OLS and Second-stage of IV

	$\log(\text{Loans}_q)$		$\log(1+i_q)$		$\log(1+r_q)$	
	OLS (1)	IV (2)	OLS (3)	IV (4)	OLS (5)	IV (6)
$\log(\text{K Inflows}_{q-1})$	0.040[a]	0.040[b]	-0.005[a]	-0.011[a]	-0.005[b]	-0.009[a]
	(0.006)	(0.017)	(0.001)	(0.001)	(0.002)	(0.003)
FX	0.645[a]	0.645[a]	-0.070[a]	-0.070[a]	-0.078[a]	-0.078[a]
	(0.012)	(0.012)	(0.003)	(0.003)	(0.003)	(0.003)
Policy rate_{q-1}	-0.078	0.153	0.231[a]	0.197[a]	0.046	0.015
	(0.262)	(0.320)	(0.022)	(0.024)	(0.059)	(0.054)
Observations	19,982,267	19,982,267	19,982,267	19,982,267	19,982,267	19,982,267
R-squared	0.850	0.850	0.791	0.793	0.778	0.779
Bank×firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls & trend	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes

▶ FirstStage ▶ LATE

VIX Reduced Form Regressions

$$\log Y_{f,b,d,q} = \widetilde{\alpha}_{f,b} + \widetilde{\lambda}_q + \widetilde{\beta} \log \text{VIX}_{q-1} + \widetilde{\delta} \text{FX}_{f,b,d,q} + \widetilde{\Theta}_1 \textbf{Bank}_{b,q-1} + \widetilde{\Theta}_2 \textbf{Macro}_{q-1} + \xi_{f,b,d,q}$$

	$\log(\text{Loans}_q)$	$\log(1+i_q)$	$\log(1+r_q)$
	(1)	(2)	(3)
$\log(\text{VIX}_{q-1})$	-0.067^b	0.019^a	0.017^a
	(0.029)	(0.003)	(0.004)
FX	0.645^a	-0.070^a	-0.078^a
	(0.012)	(0.003)	(0.003)
Policy rate_{q-1}	0.127	0.204^a	0.021
	(0.323)	(0.024)	(0.053)
Observations	19,982,267	19,982,267	19,982,267
R-squared	0.850	0.793	0.779
Bank×firm F.E.	Yes	Yes	Yes
Macro controls & trend	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes

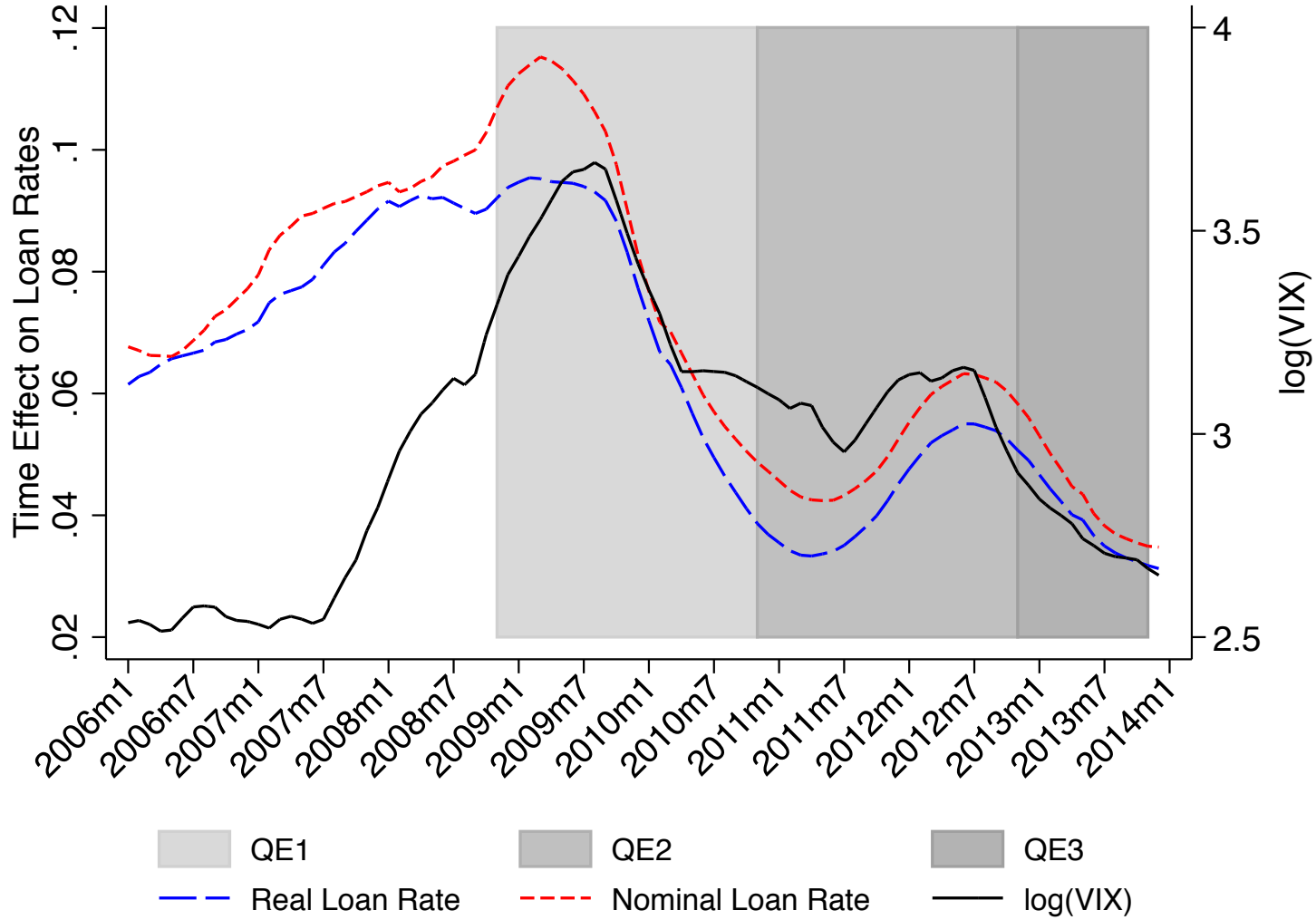
$\Rightarrow$ A fall in log(VIX) equivalent to its IQR leads to a 1 pp fall in real borrowing costs

$\Rightarrow$ Estimates can explain 43 percent of the cyclical aggregate corporate credit growth on average over the sample period

▸ Aggregate Impact

QE, VIX, Interest Rates

Effect of VIX on Dynamics of Real Borrowing Costs



Robustness

- Add firm$\times$year effects
- Decompose VIX into volatility and risk aversion
- Use only non-exporters
- Separate short and long term maturity loans
- Pre-post GFC
- Private, state and foreign banks

Heterogeneity: Differences-in-Differences

Test: Bank and Firm Risk-Taking

$$\begin{aligned}\log Y_{f,b,d,q} &= \alpha_{b,q} + \alpha_{f,q} + \kappa(\text{Noncore}_b \times \text{FinConstraint}_f \times \log \text{VIX}_{q-1}) \\ &\quad + \delta_2 \text{FX}_{f,b,d,q} + \vartheta_{f,b,d,q}, \\ \log Y_{f,b,d,q} &= \alpha_{b,q} + \alpha_{f,q} + \rho(\text{Noncore}_b \times \text{FX}_{f,b,d,q} \times \log \text{VIX}_{q-1}) \\ &\quad + \delta_3 \text{FX}_{f,b,d,q} + u_{f,b,d,q}\end{aligned}$$

Heterogeneity: Differences-in-Differences

Test: Bank and Firm Risk-Taking

$$\log Y_{f,b,d,q} = \alpha_{b,q} + \alpha_{f,q} + \kappa(\text{Noncore}_b \times \text{FinConstraint}_f \times \log \text{VIX}_{q-1}) + \delta_2 \text{FX}_{f,b,d,q} + \vartheta_{f,b,d,q},$$

$$\log Y_{f,b,d,q} = \alpha_{b,q} + \alpha_{f,q} + \rho(\text{Noncore}_b \times \text{FX}_{f,b,d,q} \times \log \text{VIX}_{q-1}) + \delta_3 \text{FX}_{f,b,d,q} + u_{f,b,d,q}$$

- Noncore_b: non-core liabilities ratio ($0 =$ "low," $1 =$ "high")
- FinConstraint_f: Firm Net Worth: ($0 =$ "low," $1 =$ "high")
- $\alpha_{f,q}$: firm×quarter effect; fully controls time varying firm unobservables
- $\alpha_{b,q}$: bank×quarter effect; fully controls time varying bank unobservables
- ALLOW heterogenous trends by bank type
- **Macro** controls are in the quarter fixed effect

Heterogeneity Results: During low VIX

★ Higher non-core banks decrease their rates/increase loan provision more: (elasticity double)

★ Low net worth firms obtain lower rates from high non-core banks

★ Higher non-core banks decrease their rate more on TL loans

	$\log(\text{Loans}_q)$			$\log(1+r_q)$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\log(\text{VIX}_{q-1})\times\text{Noncore}_b$	-0.035^b			0.015^a		
	(0.017)			(0.004)		
$\log(\text{VIX}_{q-1})\times\text{Noncore}_b\times\text{NetWorth}_f$		-0.0004			-0.005^a	
		(0.021)			(0.001)	
$\log(\text{VIX}_{q-1})\times\text{Noncore}_b\times\text{FX}$			-0.007			-0.012^a
			(0.018)			(0.004)
FX	0.690^a	0.806^a	0.745^a	-0.079^a	-0.076^a	-0.042^c
	(0.013)	(0.019)	(0.095)	(0.003)	(0.004)	(0.021)
Observations	9,280,825	1,240,310	9,280,825	9,280,825	1,240,310	9,280,825
R-squared	0.876	0.763	0.877	0.852	0.812	0.877
Bank×firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	No	No	Yes	No	No
Firm×quarter F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Bank×quarter F.E.	No	Yes	Yes	No	Yes	Yes

Interpretation

- A fall in real borrowing rates faced by **all** firms in the economy is the main transmission channel for int'l spillovers
- Banks with higher non-core liability ratio are more procylical and they decrease the rates more for low net worth (risky) firms
- Why low net worth firms DO NOT increase their borrowing more than high net worth firms given relatively lower interest rates?
  - Hypothesis 1: They borrow more from other banks
  - Hypothesis 2: They are collateral constrained.
  - Exploit loan-level data for *new issuances* each month to test existence of collateral constraints at the loan level

Issuance Regressions: Within firm-bank estimator

- Identify from within variation in loans given a firm-bank pair
- Firm f's new loan l and month m from bank b (in FX or TL):

  $$Y_{f,b,l,m} = \omega_{f,b,m} + \beta_1 \text{Collateral}_{f,b,l,m} + \beta_2 VIX_m \times \text{Collateral}_{f,b,l,m} + e_{f,b,l,m}$$

  where 'Collateral' is the loan's collateral-to-principal ratio, and $\omega_{f,b,m}$ is a configuration of firm-bank-month effects
- Further control for other loan-level characteristics (maturity, risk, sectoral use...)

Loan Level Results

★ Loan level collateral constraints are not related to firm and bank factors

★ Collateral constraints at loan level relax very little during low VIX periods; total effect of collateral on loan still positive

★ Interest rate-collateral relation does not respond to VIX once firm factors are controlled

	$\log(\text{Loans}_m)$			$\log(1+r_m)$		
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral/Loan	0.102^a	0.088^a	0.092^a	-0.002^c	-0.004^a	-0.003^a
	(0.005)	(0.010)	(0.012)	(0.001)	(0.001)	(0.001)
Collateral/Loan$\times\log(\text{VIX}_{m-1})$	0.015^c	0.028^b	0.034^b	-0.003^a	0.001	0.001
	(0.009)	(0.011)	(0.015)	(0.001)	(0.001)	(0.002)
FX	0.409^a	0.454^a	0.511^a	-0.081^a	-0.077^a	-0.077^a
	(0.020)	(0.037)	(0.043)	(0.003)	(0.003)	(0.005)
Observations	18,239,721	13,043,273	11,311,762	18,239,721	13,043,273	11,311,762
R-squared	0.731	0.833	0.845	0.646	0.832	0.855
Bank$\times$firm F.E.	Yes	Yes	No	Yes	Yes	No
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Risk F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Maturity F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	No	No	Yes	No	No
Firm$\times$month F.E.	No	Yes	No	No	Yes	No
Bank$\times$firm$\times$month F.E.	No	No	Yes	No	No	Yes

Alternative Channels

- Exchange rate appreciation (demand side): exporter-importer demand or firm balance sheet shock — firm-quarter effects
- Exchange rate appreciation (supply side): Valuation effects creating bank balance sheet shocks —no support in the data

Bank Balance Sheet Shock

	$\log(\text{Loans}_q)$			$\log(1+r_q)$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\log(\text{VIX}_{q-1}) \times \text{Capital}_b$	-0.028			-0.001		
	(0.027)			(0.002)		
$\Delta \log(\text{XR}_{q-1}) \times \text{Capital}_b$		-0.092			0.002	
		(0.101)			(0.010)	
$\mathbb{1}(\text{Depreciation}_{q-1}) \times \text{Capital}_b$			-0.006			-0.001
			(0.015)			(0.001)
FX	0.690[a]	0.690[a]	0.690[a]	-0.070[a]	-0.070[a]	-0.070[a]
	(0.013)	(0.013)	(0.013)	(0.003)	(0.003)	(0.003)
Observations	9,280,825	9,280,825	9,280,825	9,280,825	9,280,825	9,280,825
R-squared	0.876	0.876	0.876	0.857	0.857	0.857
Bank×firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm×quarter F.E.	Yes	Yes	Yes	Yes	Yes	Yes

Conclusion

- We provide causal evidence on impact of a global push factor on domestic loan growth in an important EM economy using micro data
- Our argument: A fall in borrowing rates faced by **all** firms in the economy is the main transmission channel for int'l spillovers
- Heterogeneous effects shed light on micro foundations of macro models
  - Internationally funded banks extend more credit at lower rates; offer even lower rates to low net worth (risky) firms
  - Risky firms can finance their borrowing at a lower cost but not necessarily over-borrow due to collateral constraints

Policy and Normative Implications

1. Are capital flows good or bad? Funds vs domestic financial instability
   - EM cental banker dilemma:

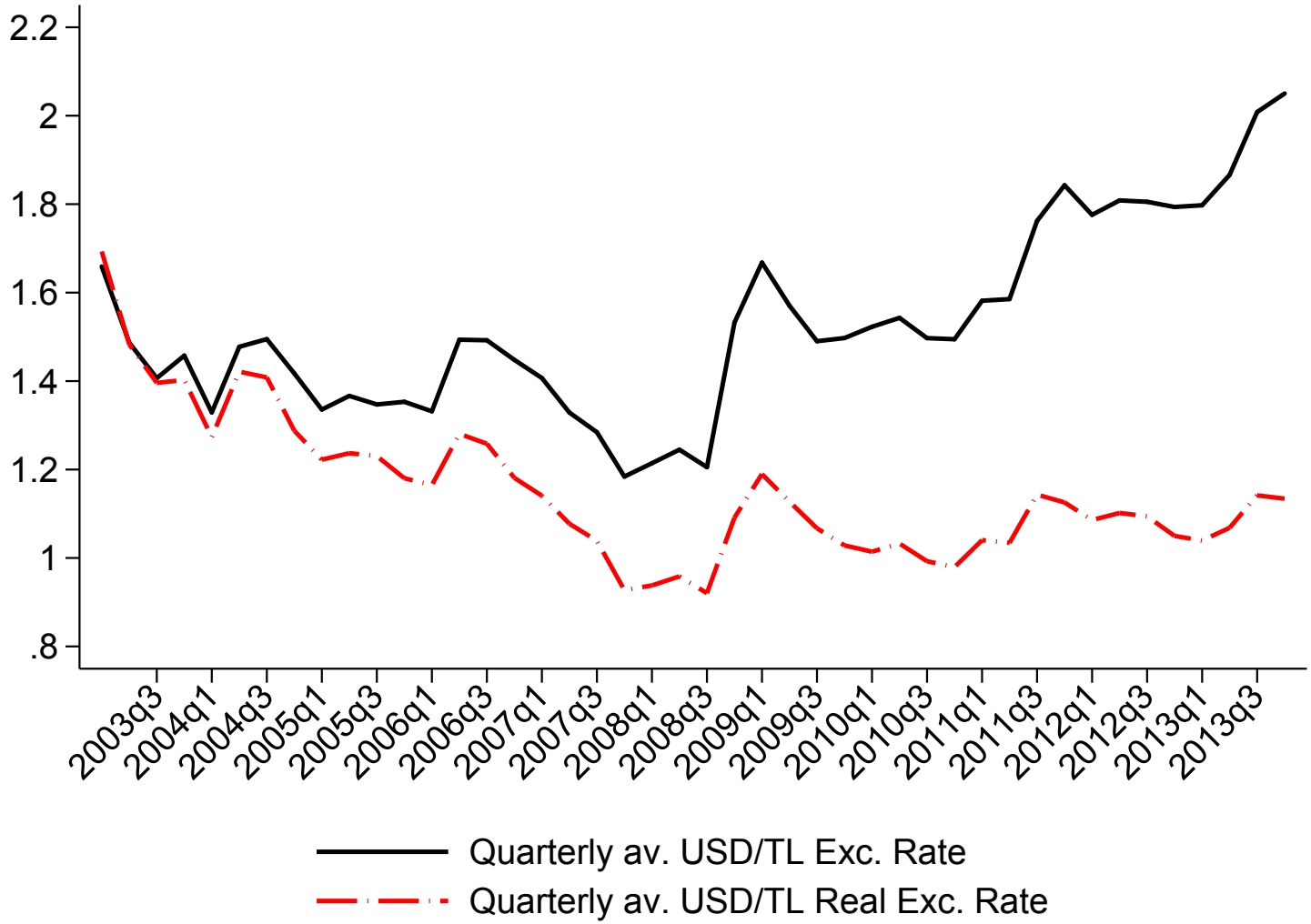
$$i_t = \alpha(y_t - y^f) + \beta(\pi - \bar{\pi}) + \gamma(e_t - \bar{e})$$

   - Two objectives, one instrument
   - With loose US MP/high global risk appetite driven capital inflows—not clear whether to raise or lower rates so use other tools.
2. Our results: Regardless of policy stance and tools, exogenous capital inflows reduce borrowing costs of agents that lead to credit expansion due to reduced cost of financial intermediation.
   - Importance of financial frictions (Rajan, 2014 vs. Bernanke 2013)
   - MP independence vs effectiveness (Rey, 2013 vs. Obstfeld 2014)

Appendix Slides

Exchange Rates

via-vis-USD



Collateral Shock via Exchange Rate Changes

	$\log(\text{Loans}_m)$			$\log(1+r_m)$		
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral/Loan	0.103^a	0.090^a	0.093^a	-0.002^b	-0.004^a	-0.003^a
	(0.005)	(0.010)	(0.012)	(0.001)	(0.001)	(0.001)
Collateral/Loan$\times\Delta$ logXR	-0.045	0.005	-0.005	-0.009	-0.003	-0.007
	(0.095)	(0.098)	(0.133)	(0.006)	(0.010)	(0.013)
FX	0.409^a	0.455^a	0.511^a	-0.081^a	-0.077^a	-0.077^a
	(0.020)	(0.037)	(0.043)	(0.003)	(0.003)	(0.005)
Observations	18,239,721	13,043,273	11,311,762	18,239,721	13,043,273	11,311,762
R-squared	0.731	0.833	0.845	0.646	0.832	0.855
Bank$\times$firm F.E.	Yes	Yes	No	Yes	Yes	No
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Risk F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Maturity F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Month F.E.	Yes	No	No	Yes	No	No
Firm$\times$month F.E.	No	Yes	No	No	Yes	No
Bank$\times$firm$\times$month F.E.	No	No	Yes	No	No	Yes

Aggregate Impact

Global-predicted loan growth:

$$\widehat{\log(\text{Loan}_{f,b,d,q})} = \widehat{\widetilde{\beta}} \log(\text{VIX}_{q-1})$$

Differentiate and multiply by $w_{f,b,d,q-1}$, such that $\sum w_{f,b,d,q-1} = 1$

$$w_{f,b,d,q-1} \text{d}\widehat{\log(\text{Loan}_{f,b,d,q})} = w_{f,b,d,q-1} \widehat{\widetilde{\beta}} \text{d} \log(\text{VIX}_{q-1})$$

so,

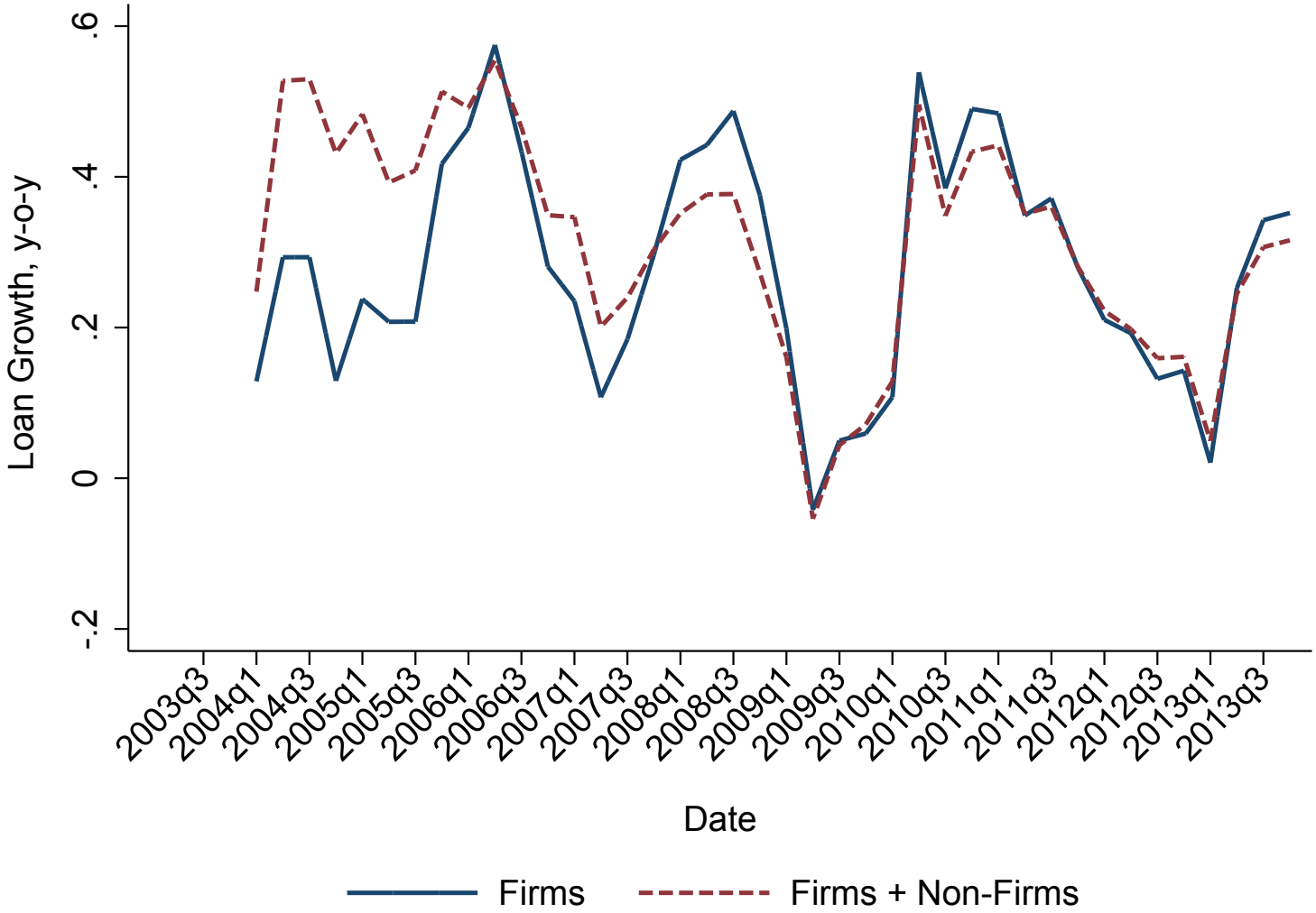
$$w_{f,b,d,q-1} \widehat{\left(\frac{\Delta \text{Loan}}{\text{Loan}}\right)}_{f,b,d,q} = w_{f,b,d,q-1} \widehat{\widetilde{\beta}} \left(\frac{\Delta \text{VIX}}{\text{VIX}}\right)_{q-1}$$

Summing above equation over $\{f, b, d\}$ in a given quarter q:

$$\widehat{\left(\frac{\Delta \text{Loan}}{\text{Loan}}\right)}_{q} = \widehat{\widetilde{\beta}} \left(\frac{\Delta \text{VIX}}{\text{VIX}}\right)_{q-1}$$

◂ Economic significance

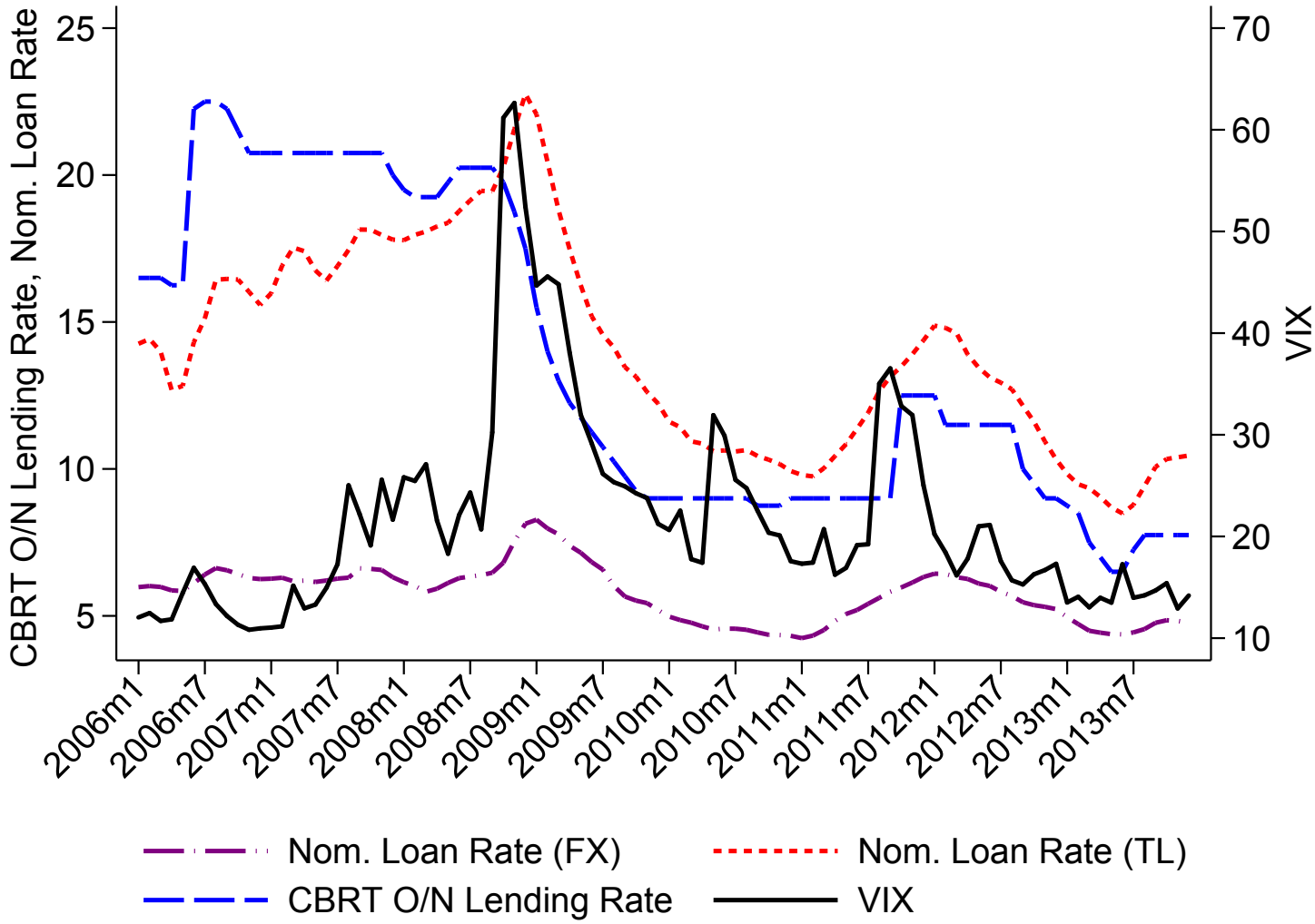
Loan Growth Comparison of Corporate Sector and Whole Economy, 2003–13



Notes: Firm matched sample and Whole CR growth rate of loans.

Data

Policy Rate, Average Lending Rates, and VIX, 2003–13



Sources: CBRT

◂ Macro regressions

First-Stage Regressions: Capital Inflows, 2003–13

Panel A. OLS and Second-stage of IV

	$\log(\text{Loans}_q)$		$\log(1+i_q)$		$\log(1+r_q)$	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
$\log(\text{K Inflows}_{q-1})$	0.040[a]	0.040[b]	-0.005[a]	-0.011[a]	-0.005[b]	-0.009[a]
	(0.006)	(0.017)	(0.001)	(0.001)	(0.002)	(0.003)
FX	0.645[a]	0.645[a]	-0.070[a]	-0.070[a]	-0.078[a]	-0.078[a]
	(0.012)	(0.012)	(0.003)	(0.003)	(0.003)	(0.003)
Policy rate_{q-1}	-0.078	0.153	0.231[a]	0.197[a]	0.046	0.015
	(0.262)	(0.320)	(0.022)	(0.024)	(0.059)	(0.054)
Observations	19,982,267	19,982,267	19,982,267	19,982,267	19,982,267	19,982,267
R-squared	0.850	0.850	0.791	0.793	0.778	0.779
Bank×firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls & trend	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. First-stage of IV: $\log(\text{K inflows}_q)$ Regression

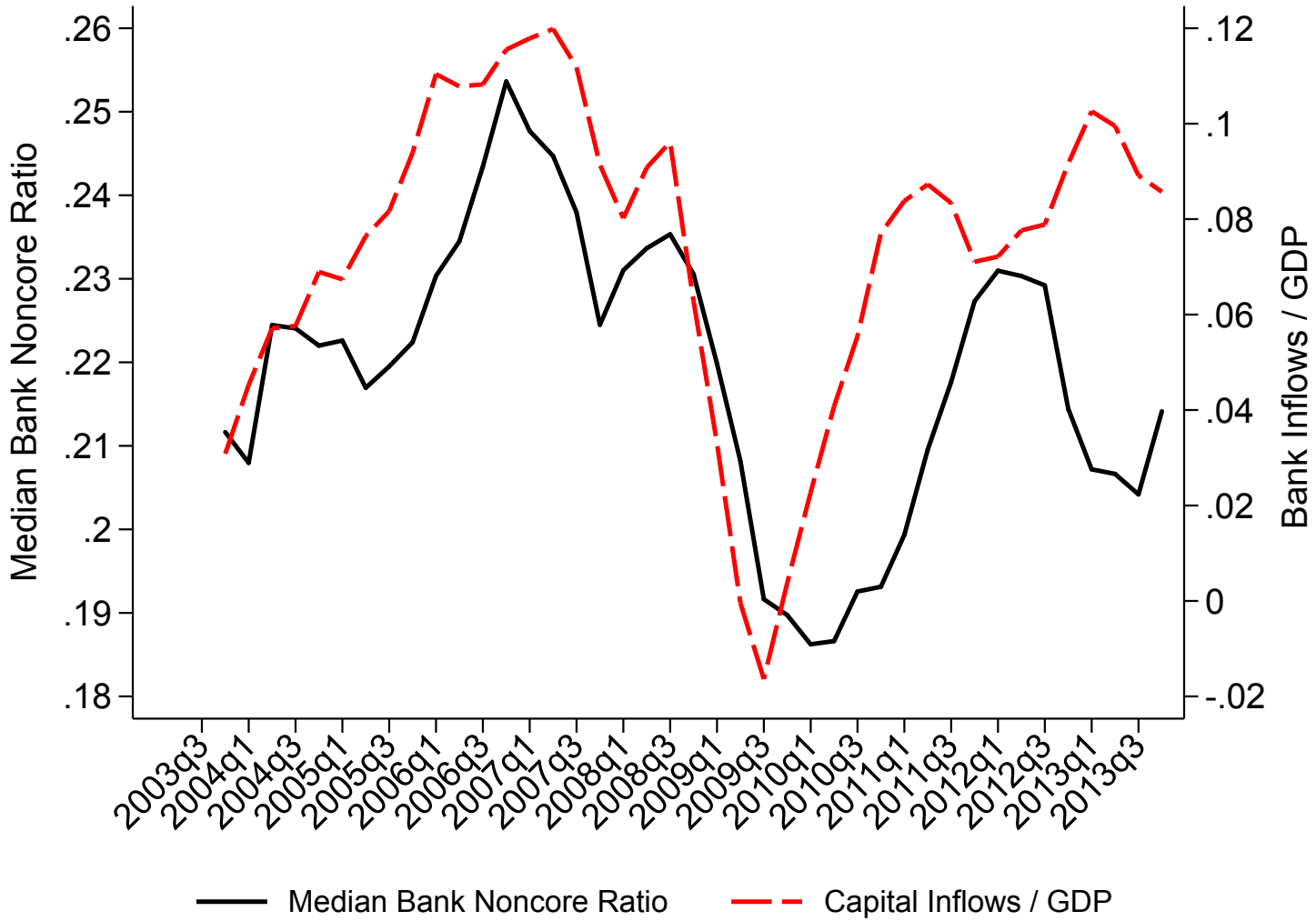
$\log(\text{VIX}_{q-1})$	Observations	R-squared	F-stat
-1.694[a]	1,685	0.571	16.35
(0.419)			

◂ Macro regressions

Bank Heterogeneity

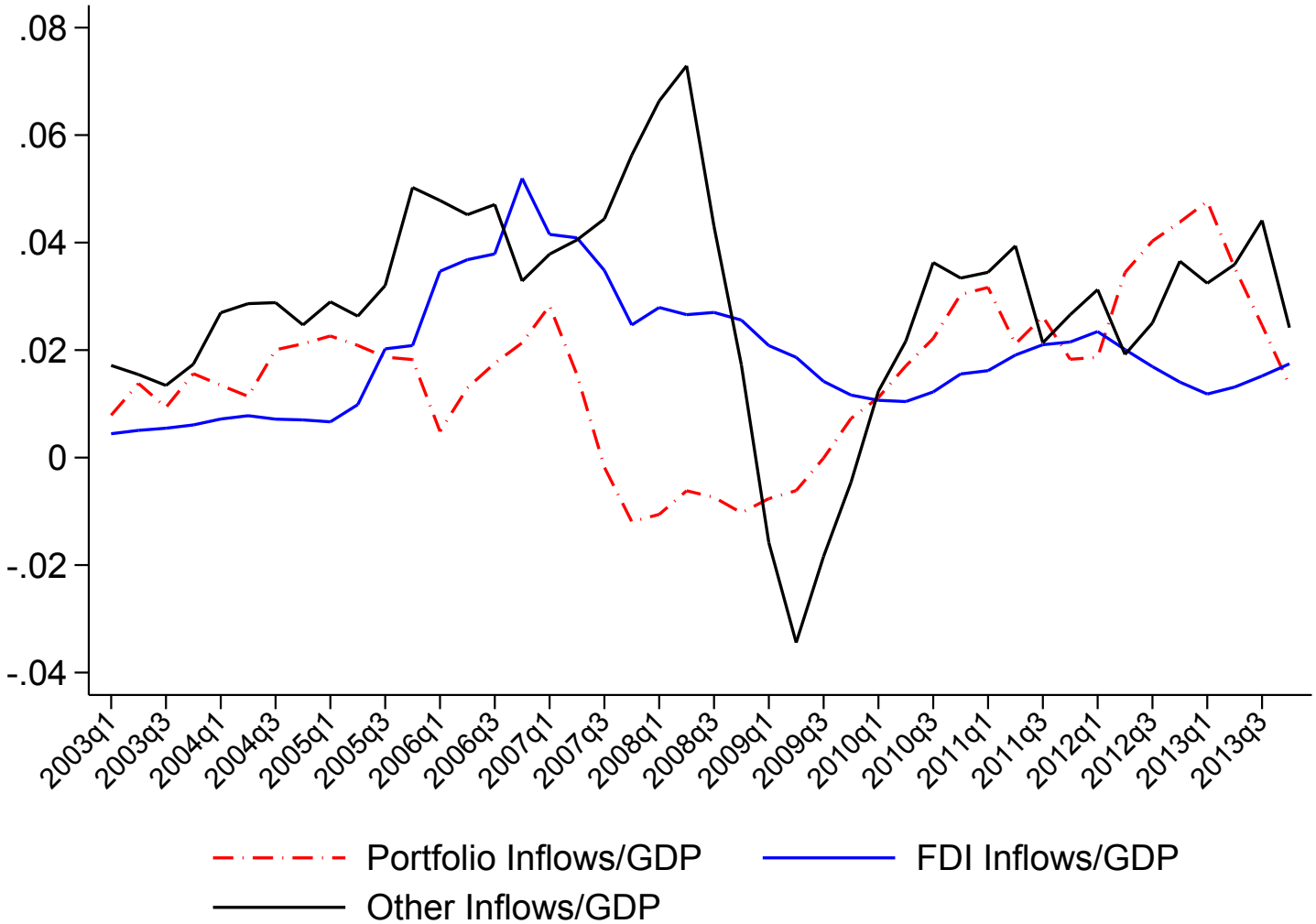
Large and high non-core liability banks are more procylical

"Capital Flows and International Credit Channel" (Baskaya, di Giovanni, Kalemli-Ozcan, Peydro, Ulu)



Macro regressions

Bank Flows



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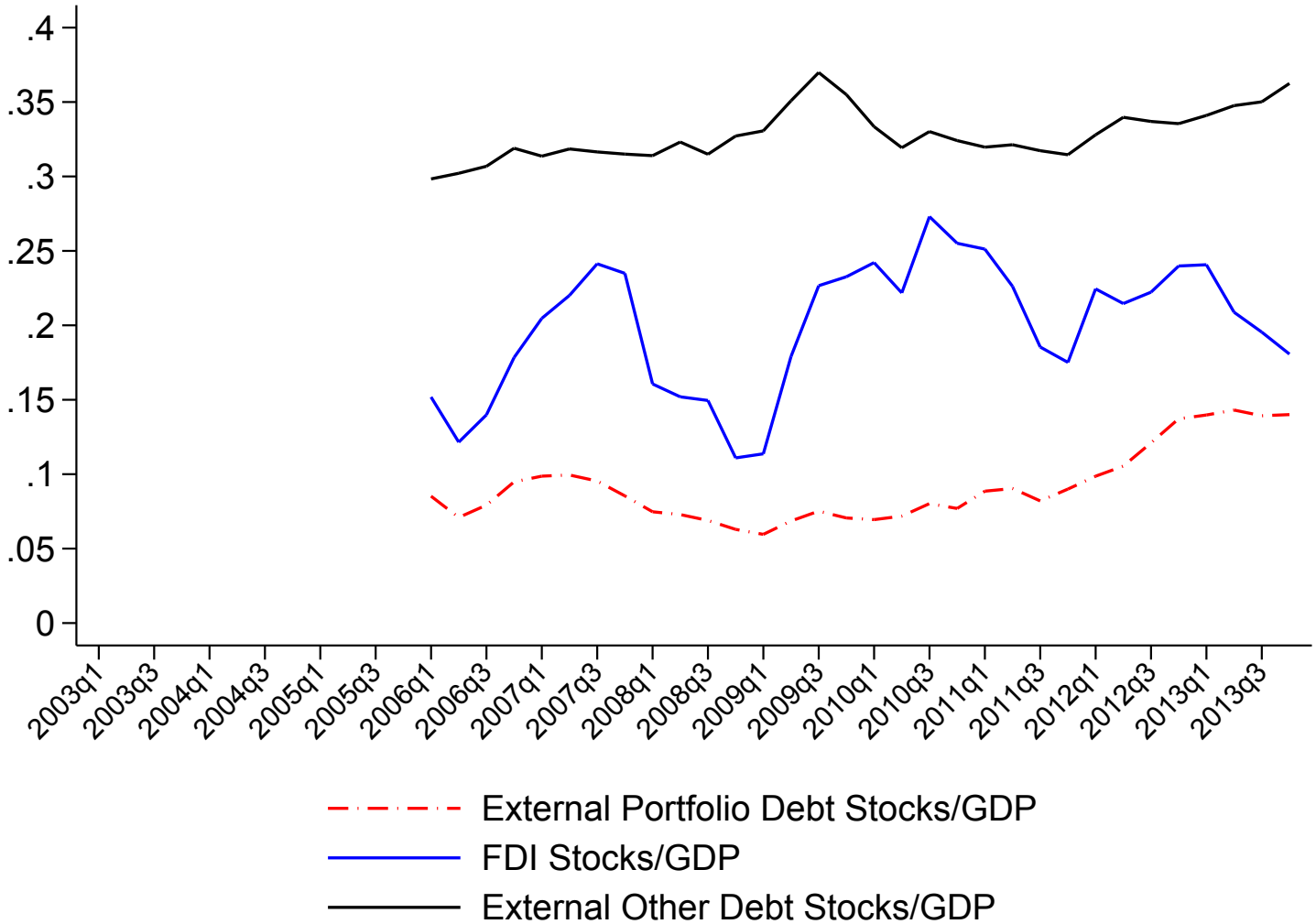
Bank Stocks



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Emerging Markets

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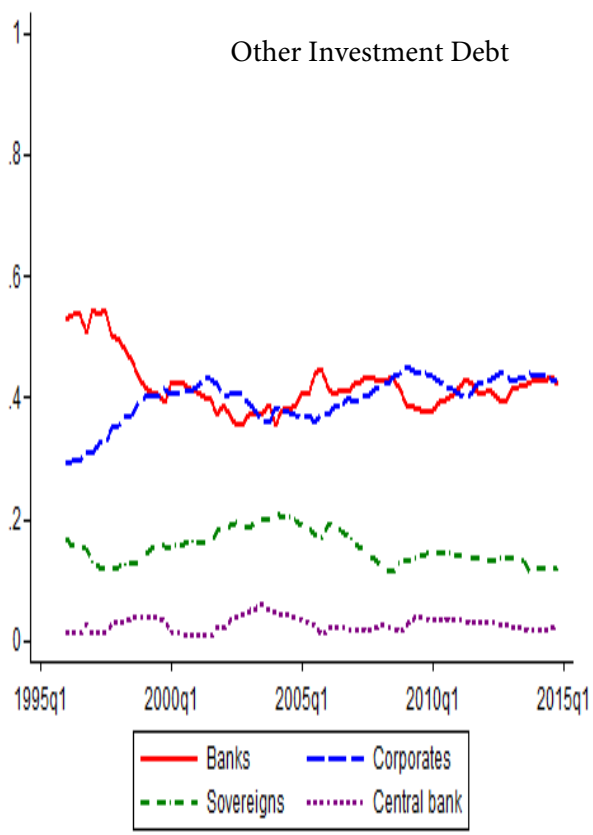

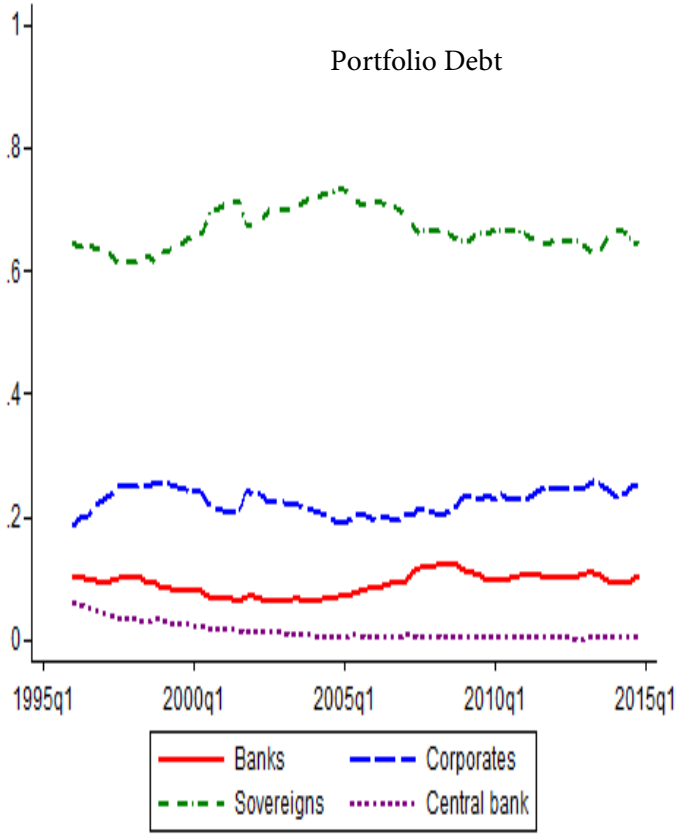

Banking Sector Growth

	Assets/GDP	Loans/GDP	Deposit/GDP
2003	0.54	0.14	0.33
2004	0.55	0.18	0.34
2005	0.6	0.23	0.37
2006	0.64	0.28	0.39
2007	0.67	0.32	0.41
2008	0.74	0.37	0.46
2009	0.84	0.39	0.51
2010	0.92	0.48	0.56
2011	0.94	0.53	0.54
2012	0.97	0.56	0.54
2013	1.11	0.67	0.60

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Firm Coverage

		Gross Output	
	Strata	All Sectors	Mfg. Sector
Sample	1-19 employees	0.053	0.013
	20-249 employees	0.304	0.235
	250+ employees	0.642	0.752
TurkStat	1-19 employees	0.270	0.095
	20-249 employees	0.364	0.361
	250+ employees	0.367	0.544

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Macro Variables

	Obs.	Mean	Median	Std. Dev	IQR	Min.	Max.
Real GDP Growth (q-o-q)	44	0.012	0.012	0.017	0.022	-0.059	0.048
Inflation (q-o-q, annualized)	44	0.089	0.069	0.066	0.073	-0.013	0.322
Δ log(TL/US$) (q-o-q)	44	0.006	0.001	0.066	0.058	-0.104	0.271
CBRT overnight rate	44	0.188	0.182	0.113	0.118	0.067	0.517
Expected annual inflation (y-on-y)	44	0.088	0.07	0.049	0.017	0.055	0.264
CA/GDP	44	-5.144	-5.379	3.63	2.227	-9.803	-1.303
log(Capital inflows)	44	18.25	18.61	0.926	0.730	15.92	19.22
log(VIX)	44	2.957	2.913	0.368	0.567	2.401	4.071
US 10-year/3-month spread	44	0.020	0.023	0.012	0.016	-0.004	0.036

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