EEA-ESEM Congress 2023

In the Right Hands?
Capital Inflows and Allocation of Credit Across Firms: Evidence from Emerging Europe

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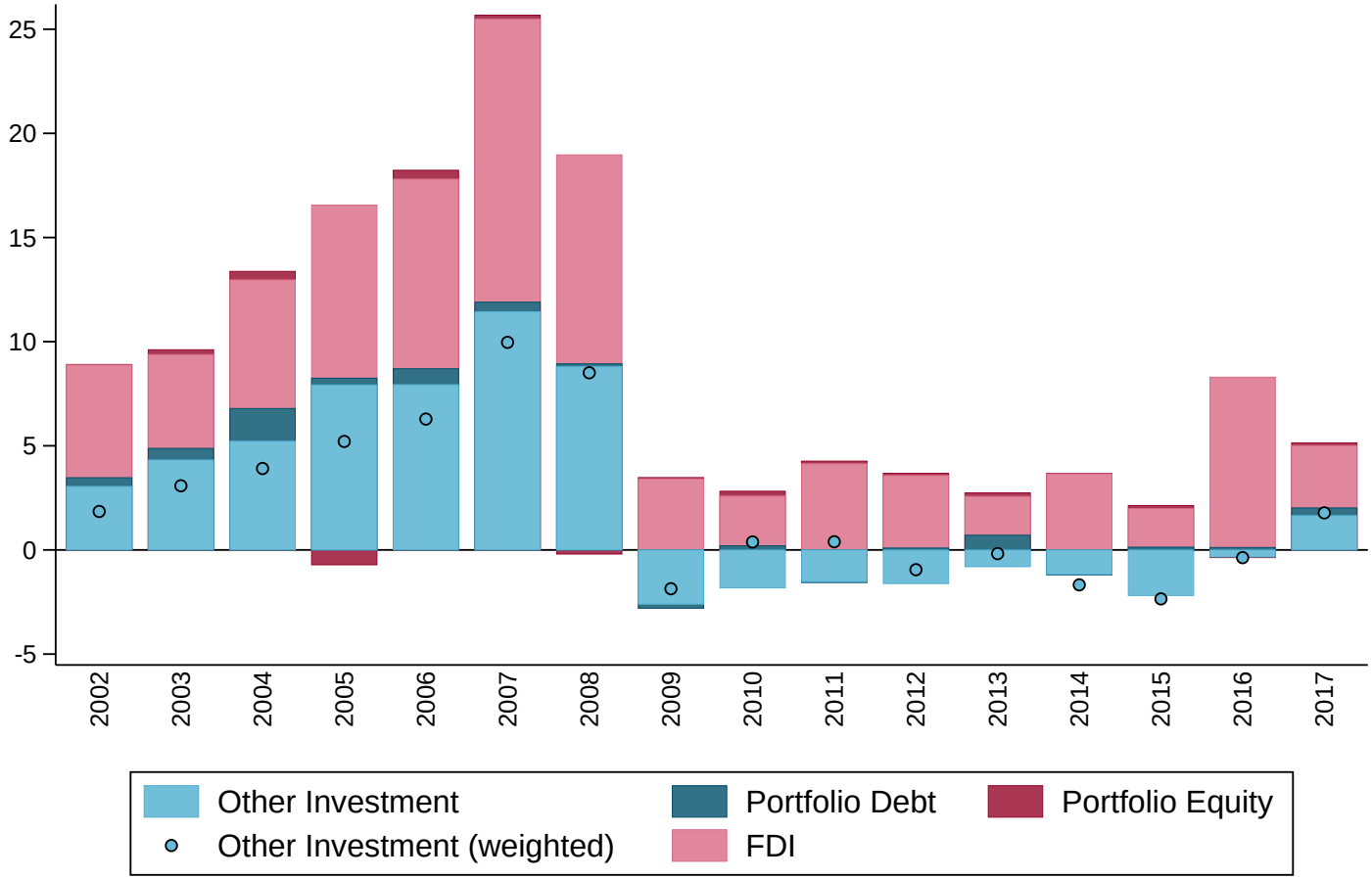
Overview

- **Research question:** Are capital flows (CF) channeled by the local banking sector to their more productive use?
- Growing evidence, but still limited and not univocal (e.g., Reis, 2013; Gopinath et al., 2017; Larrain and Stumpner, 2017; Cingano and Hassan, 2020)
- **Our paper:** We study how and through which channels CF influence the allocation of credit within industries across firms that differ in their ex-ante productivity.
- Focus on 12 CEE emerging countries, using a large panel of firms over 2003–2017.
- **Main results:** Higher CF increase the credit growth rates of low TFP firms significantly more than their more productive industry peers.
  Results suggest a risk-taking channel of CF that leads to a misallocation of credit towards the less productive.

Some Stylized Facts (Pooled Sample)

Figure. Total Inflows to the Private Sector by Main Types, (in % of nominal GDP)

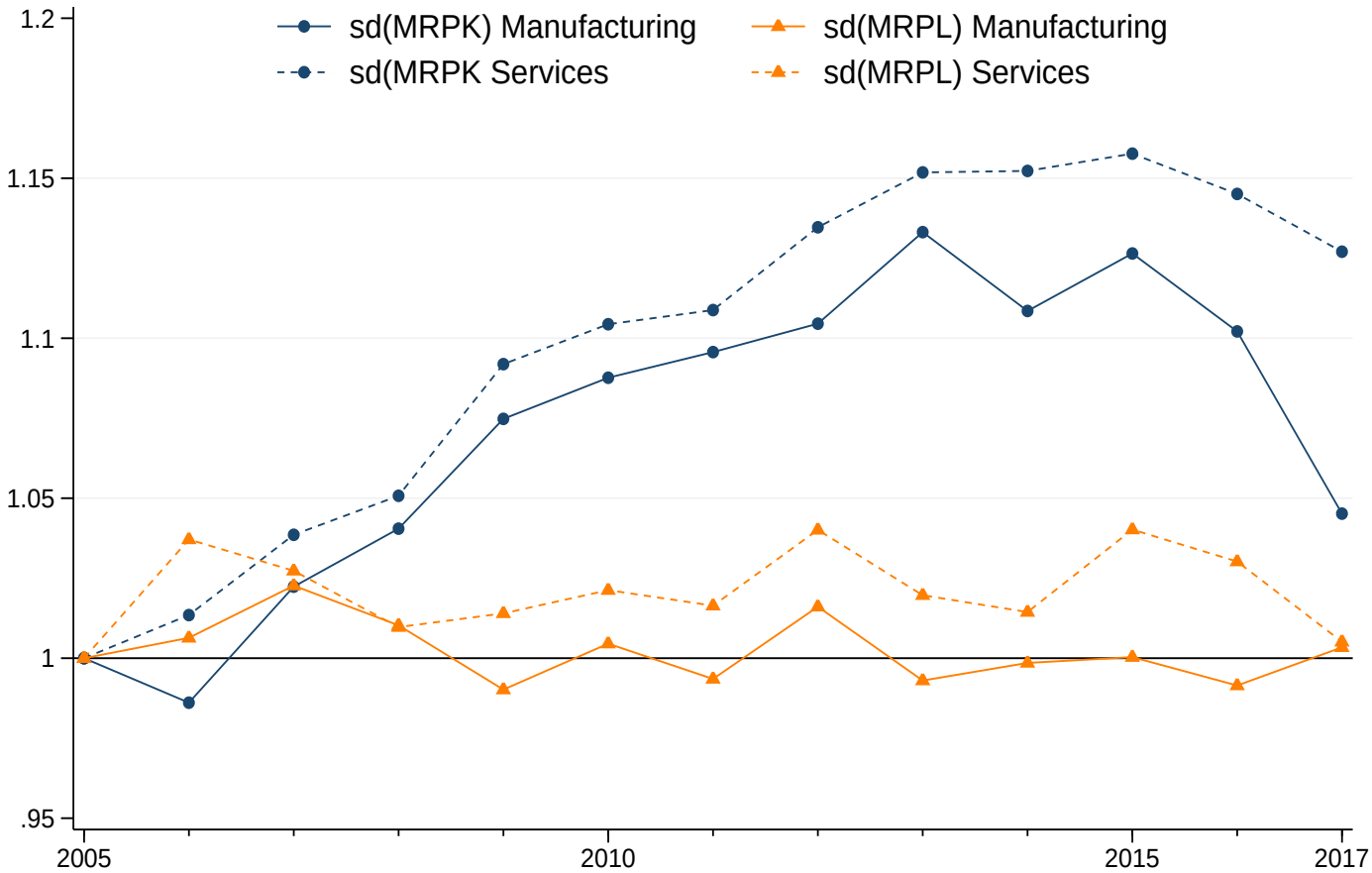
Sources: IMF's BOP, authors' calculations.



Some Stylized Facts (Pooled Sample)

Figure. Within-Industry Dispersion in MRPK and MRPL *(2005=1)*

Sources: ORBIS, authors' calculations, based on Hsieh and Klenow (2009) model.



Data

- ORBIS-AMADEUS data on firms' balance sheet and income statement.
  - Follow an extensive data cleaning.
  - Focus on 12 CEE countries, covering manufacturing and services sectors.
  - Account for roughly 26% of aggregate official output. SMEs $\approx$ 90% of firms.
  - Construct 2 core firm-level measures:
    - $y_{it} \equiv$ total financial debt

      ✓ **bank loans** + bonds
      × trade credit + other liabilities

    - $\widehat{TFP}_{ijct} = va_{ijct} - (\hat{\beta}^k_{jc} k_{it} + \hat{\beta}^l_{jc} l_{ijct})$

      input elasticities estimated for each ctry-sector
      control fct (Levinsohn and Petrin, 2003), IV (Woolridge, 2009)

- Non-resident (gross) capital inflows data
  - Based on IMF's BOP, relying on **debt inflows to the private sector**.
  - Use BIS's banking inflows as a robustness.

Empirical Approach

Benchmark Specification

$$\Delta \ln(y_{i,t}) = \sum_{q=0}^{2} \beta_q \left(D^{TFP}_{i,t-1} \times CF_{c,t-q} \right) + \gamma D^{TFP}_{i,t-1} + \theta_l X^{l}_{i,t-1} + \alpha_i + \alpha_{c,s} + \alpha_{s,t} + \alpha_{c,t} + \epsilon_{i,t}$$

Analyze the within-firm effect of CF on firm's credit growth, and how it differs across firms of different initial TFP within the same industry-country-sizeclass.

$\Delta \ln(y_{i,t})$ log-difference of firm's financial debt

- Capture intensive margin adjustments only
- 2 other outcome variables to accommodate extensive margin changes:

$\frac{y_{i,t} - y_{i,t\text{-}1}}{0.5(y_{i,t} + y_{i,t\text{-}1})}$ $\longrightarrow$ DHS mid-point growth rate

$\frac{\Delta y_{i,t}}{TotalAssets_{i,t-1}}$ $\longrightarrow$ first-difference in financial debt scaled by lagged total assets

- Alternative y: total liabilities as a noisy proxy of bank debt

Empirical Approach

Benchmark Specification

$$\Delta \ln(y_{i,t}) = \sum_{q=0}^{2} \beta_q \left(D^{TFP}_{i,t-1} \times CF_{c,t-q} \right) + \gamma D^{TFP}_{i,t-1} + \theta_l X^{l}_{i,t-1} + \alpha_i + \alpha_{c,s} + \alpha_{s,t} + \alpha_{c,t} + \epsilon_{i,t}$$

Analyze the within-firm effect of CF on firm's credit growth, and how it differs across firms of different initial TFP within the same industry-country-sizeclass.

$\Delta \ln(y_{i,t})$ log-difference of firm's financial debt

$\sum_{q=0}^{2} CF_{c,t-q}$ country-level debt inflows (% GDP) measured at time t and up to 2 lags

- delayed impact of CF on domestic lending ($\approx$ peak after 2yr)

$CF_{c,MA,t,t-2}$ $\longrightarrow$ for ease of exposition

$D^{TFP}_{i,t-1}$ time-varying firm-level TFP dummy

- $D^{TFP}_{i,t-1} = 1$ if $TFP_{i,t-1}$ & $TFP_{i,t-2} >$ median (or p66, p75) defined at the country-industry-year and size class (SMEs, large) level

Empirical Approach

Benchmark Specification

$$\Delta \ln(y_{i,t}) = \sum_{q=0}^{2} \beta_q \left(D_{i,t-1}^{TFP} \times CF_{c,t-q} \right) + \gamma D_{i,t-1}^{TFP} + \theta_l X_{i,t-1}^{l} + \alpha_i + \alpha_{c,s} + \alpha_{s,t} + \alpha_{c,t} + \epsilon_{i,t}$$

Analyze the within-firm effect of CF on firm's credit growth, and how it differs across firms of different initial TFP within the same industry-country-sizeclass.

$\Delta \ln(y_{i,t})$ log-difference of firm's financial debt

$\sum_{q=0}^{2} CF_{c,t-q}$ country-level capital inflows measured at time t and up to 2 lags

$D_{i,t-1}^{TFP}$ time-varying firm-level TFP dummy

$X_{i,t-1}^{l}$ firm controls

$\alpha_i + \alpha_{c,s} + \alpha_{s,t} + \alpha_{c,t}$ firm, country-industry, industry-year and country-year fixed effects

➧ **Help tease out the identification of the credit supply effects induced by CF**

Intensive margin results

Table. Firm's Credit Growth and Capital Inflows, Intensive Margin Adjustments

Dependent variable: $\Delta \ln(y_{i,t})$	Panel A: TFP cutoff p50						Panel B: TFP cutoff p25–p75					
	All		SME		Large		All		SME		Large	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}$	-0.276***	-0.307***	-0.296***	-0.338***	-0.268*	-0.267*	-0.454***	-0.516***	-0.487***	-0.580***	-0.340	-0.290
	(-5.42)	(-4.61)	(-5.43)	(-4.78)	(-1.79)	(-1.73)	(-5.25)	(-4.49)	(-5.25)	(-4.68)	(-1.30)	(-1.09)
$\diamond CF_{c,MAt,t-2}$ [Low TFP]		1.766***		1.878***		1.016***		1.983***		2.150***		1.072***
		(11.37)		(11.36)		(5.70)		(11.51)		(11.56)		(4.00)
$\diamond CF_{c,MAt,t-2}$ [High TFP]		1.459***		1.540***		0.749***		1.467***		1.570***		0.782***
		(10.38)		(10.20)		(4.06)		(9.63)		(9.55)		(2.74)
Observations	826217	826217	738657	738657	86656	86656	401762	401762	359306	359306	41274	41274
Number of firms	183521	183521	166907	166907	16466	16466	104075	104075	94301	94301	9566	9566
Dep. var. avg;p50 (in %)	0.8;-3.5	0.8;-3.5	0.2;-4.3	0.2;-4.3	5.7;0	5.7;0	1.2;-3.1	1.2;-3.1	0.7;-3.7	0.7;-3.7	5.6;0	5.6;0
Firm Controls$_{i,t-1}$	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Macro Controls$_{c,t-1}$	no	**yes**	no	**yes**	no	**yes**	no	**yes**	no	**yes**	no	**yes**
Country-Year FE	yes	**no**	yes	**no**	yes	**no**	yes	**no**	yes	**no**	yes	**no**
Other FE: i, $s \times t$, $c \times s$	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

- Focus on the intensive margin of credit growth, and estimate both relative and absolute effects.
- Credit at times of CF goes to everyone (small, large, low/high TFP).
- But *relatively more* towards ex-ante low TFP firms, especially at the tails of the TFP distribution.

Accommodating extensive margin adjustments

Table. Intensive and Extensive Margin Changes for SMEs

Margin Changes:	Intensive only (1)	Intensive + Extensive (2)	Intensive + {entry} (3)	Intensive + {exit} (4)
Panel A. Dep. var. : $\frac{y_{i,t}-y_{i,t-1}}{0.5(y_{i,t}+y_{i,t-1})}$				
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.279*** (-5.25)	-0.498*** (-6.97)	-0.499*** (-8.16)	-0.255*** (-4.09)
Panel B. Dep. var. : $\frac{\Delta y_{i,t}}{TotalAssets_{i,t-1}}$				
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.056*** (-6.05)	-0.065*** (-7.22)	-0.074*** (-7.97)	-0.045*** (-5.14)
Observations	738657	918248	820108	826265
Intensive changes	738657	763527	754087	755622
Entrants	0	75143	66021	0
Exiters	0	79578	0	70643
Panel A Dep. var. avg;p50 (in %)	-0.7;-4.3	-2;-4.7	15.3;0	-18;-8.9
Panel B Dep. var. avg;p50 (in %)	1.1;-0.6	1.3;-0.4	2;0	0.5;-1
$\text{Firm Controls}_{i,t-1}$	yes	yes	yes	yes
Fixed Effects: $i,s\times t,c\times t,c\times s$	yes	yes	yes	yes

Table. Zero Leverage SMEs, Probability to Access Credit

$$Pr(Z=1) \text{ with } Z=\begin{cases} 1 & \text{if } y_{i,t-1}=0 \text{ and } y_{i,t}>0 \\ 0 & \text{if } y_{i,t-1}=y_{i,t}=0 \end{cases}$$

Sample:	Including time-invariant firms		Switchers only	
Min. # obs. per firm:	n.a. (1)	4 years (2)	n.a. (3)	4 years (4)
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.035 (-1.38)	-0.046* (-1.77)	-0.167** (-2.11)	-0.179** (-2.20)
$\text{Firm Controls}_{i,t-1}$	yes	yes	yes	yes
Fixed Effects: $i,s\times t,c\times t,c\times s$	yes	yes	yes	yes
Observations	577126	377362	174470	111629
Number of firms	149463	66281	45840	20082
# switchers to >0	48483	20175	45840	20082
# always $=0$	100980	46106	0	0
Avg. predicted prob.	[0.1014]	[0.0676]	[0.3038]	[0.2263]

- Following CF, the proportion of firms entering the credit market and the net change in credit obtained when entering is relatively higher among low TFP firms

Why is credit flowing relatively more towards low TFP firms?

1. Low TFP firms *might* have on average higher credit demand at times of CF.
   ↳ Fixed effects + firm controls should capture differences in credit needs across firms fairly well.

2. Low TFP firms *might* face initially tighter credit constraints.
   ↳ Not straightforward as high TFP firms are unable to invest as desired.
   - We find that CF do not necessarily release credit constraints, as the effect is stronger for firms with high preexisting collateral (in line with di Giovanni et al., 2021; Gopinath et al., 2017).

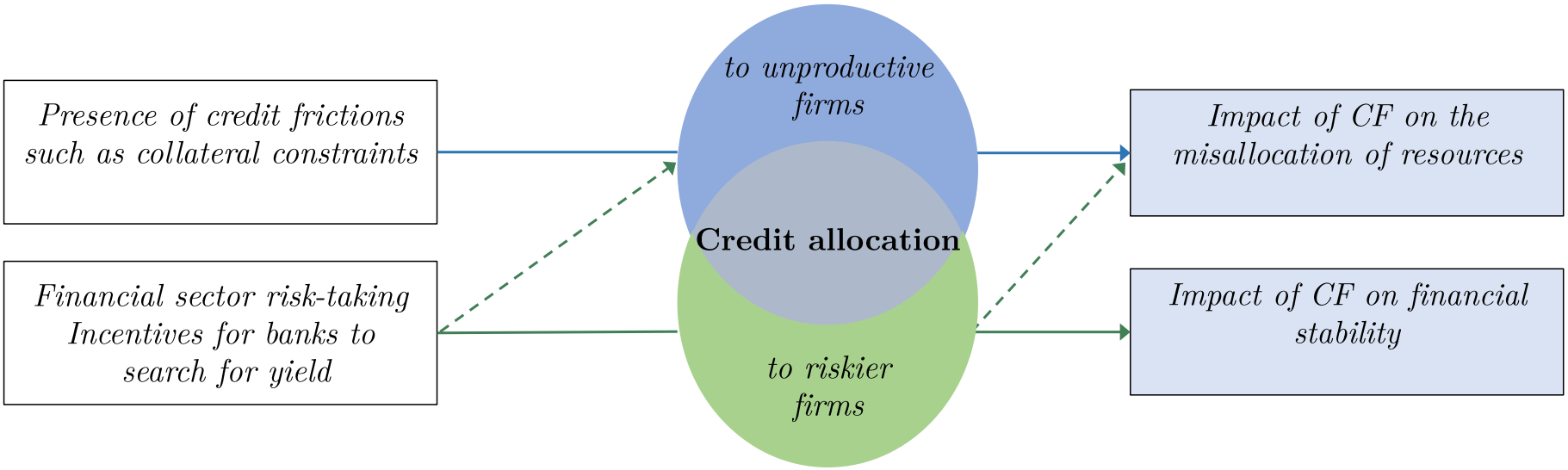
3. A risk-taking channel of capital inflows.
   - CF induce a credit allocation titled towards high risk and high collateral firms.
   - These attributes are more prevalent in low TFP firms in our sample.
   - After accounting for the 3 dimensions simultaneously, the TFP dimension looses power, risk considerations seem to drive our results.

▸ Approach & Results

Other evidence

* Is it a credit misallocation? See
  - ✓ Credit flows to firms that are inefficiently over-resourced (Hsieh and Klenow, 2009).
  - ✓ Credit is not relatively at better use in ex-ante low TFP firms.
* Symmetric effects with non-resident capital outflows. See
* Contrasts from a sample of 10 advanced countries. See
  - ↳ Weighted Least Squares to draw meaningful comparison
  - ↳ Differential effects are also negative, but smaller, and limited to periods of capital outflows.
* Results occur mostly when foreign capital is driven by global push factors. See
* Extensive robustness checks: different measures of firm's debt, various CF and productivity measures, and other settings for the TFP dummy. See

Concluding Remarks



- Suggest a bridge between 2 strands of literature.
- Highlight a risk-taking channel of capital inflows (see e.g., Karolyi, Sedunov and Taboada, 2018; Dinger and te Kaat, 2020; te Kaat, 2021; Cantú et al., 2022) that may lead to a credit misallocation towards the less productive.

Extra Slides

Identification & Approach : Pros and Cons

Go Back

Our approach: firm-level data

– Partly control for firm's credit demand

↳ $X^{I}_{i,t-1}$ to control for time variation in firm performance and creditworthiness.

↳ α_i to soak up unobserved firm constant attributes.

↳ $\alpha_{s,t}+\alpha_{c,t}$ (or $\alpha_{s,c,t}$) to control for unobserved time-varying aggregate and local credit demand. *=> assume that in t, all firms in the same 4-digit sector and country face a similar credit demand.*

– Bank dimension missing

↳ Cannot identify the banks more exposed to CF, nor the riskier banks

\+ Not limited to multiple-bank firms

\+ Cross-country setting

Loan-level data

\+ More rigorous identification

↳ $\alpha_{i,t}$ to control for any shocks to firm-specific credit demand

\+ Greater granularity that enables more diff-in-diff exercises

– Forgoes single bank firms

↳ sample selection issue especially for SMEs and emerging countries

– Credit registry data often lack in CEE countries

– Usually focus on a single country

=> balance between results' **internal and external validity**

Why low TFP firms? Approach and Results

Go Back

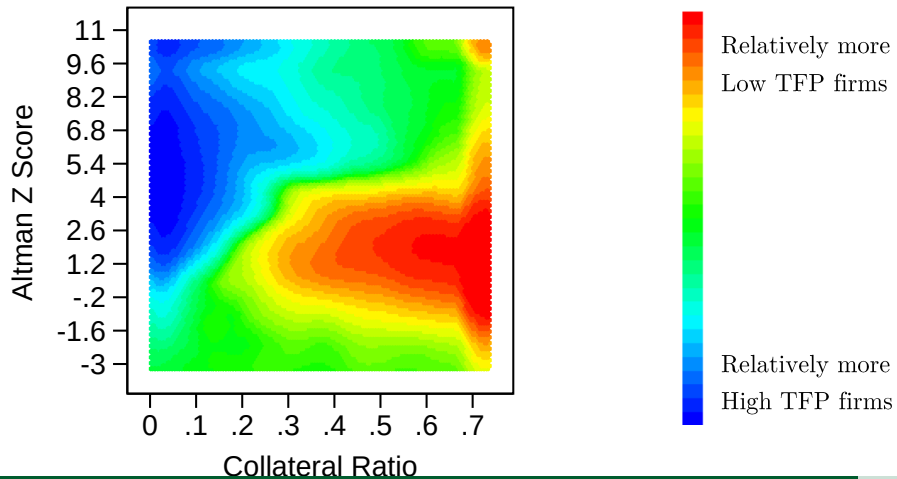
- Put TFP aside and analyze the heterogeneity along firms' collateral and risk characteristics.
  - riskier firms
  - firms with higher collateral

* Size-dependent borrowing constraints not necessarily relaxed with CF
* High collateral/risk consistent with observed risk hypothesis
* Large discrepancies in risk and collateral attributes across high/low TFP firms

Table. Debt Growth and CF, Other Firm Characteristics (Intensive Margin)

Dep. var.: $\Delta \ln(y_{i,t})$	Risk				Financial Constraints	
Firm-level Proxies:: *Proxy cutoff p50*	Altman's Z Score	Debt Overhang	Cash-Flow Ratio	Leverage Ratio	Collateral Ratio	Cash Ratio
	(1)	(2)	(3)	(4)	(5)	(6)
$D_{i,t-1}^{Proxy} \times CF_{c,MAt,t-2}$	-0.587***	-0.344***	-0.290***	0.249***	0.288***	-0.368***
	(-11.81)	(-7.06)	(-5.33)	(4.76)	(6.32)	(-7.04)
Observations	808395	840077	739804	862829	870246	742401
Number of firms	181739	186407	172943	187945	187443	172875
Firm Controls$_{i,t-1}$	yes	yes	yes	yes	yes	yes
FE: $i, s\times t, c\times t, c\times s$	yes	yes	yes	yes	yes	yes

Figure. Bivariate Densities of Low TFP vs. High TFP Firms



Why low TFP firms? Approach and Results

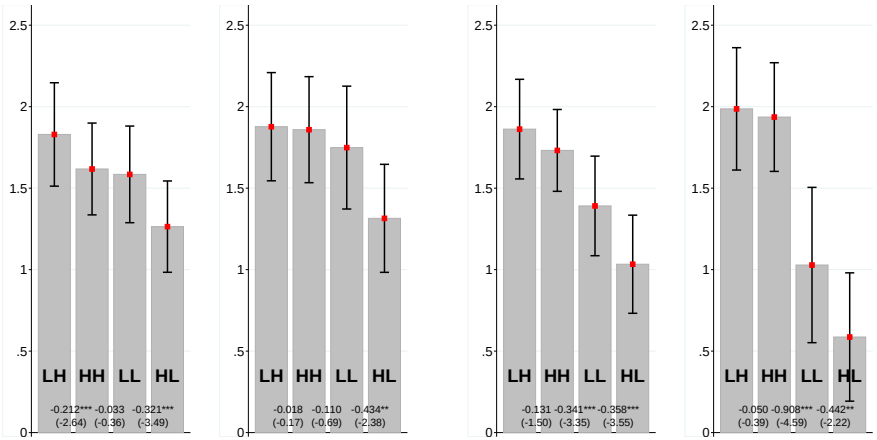
Go Back

- Put TFP aside and analyze the diff. effect of CF on credit growth for other firm characteristics.
  - ▶ CF benefit more firms with higher collateral and risk (attributes prevalent in low TFP).

- Split firms into 4 groups.
- ▶ Some nuances: no clear difference between HH and LH
- ▶ Conditional on being of high TFP, lending after CF increases systematically the least for low collateral or low risk firms (HL).

Table. Debt Growth and Capital Inflows, TFP–Collateral and TFP–Risk

$Y = \Delta \ln(y_{i,t})$	**Dimension 1: TFP** (H•: High TFP, p50 cutoff); **Dimension 2:**			
	Collateral Ratio (•H : High Collateral)		**Altman's Z Score** (•H : High Risk)	
Cut-off for Dimension 2	p50	p25-p75	p50	p25-p75
Test H0: •H=•L (p-value)	18.45^{***} (0.000)	10.22^{***} (0.000)	61.890^{***} (0.000)	63.390^{***} (0.000)
Test H0: H•=L• (p-value)	10.31^{***} (0.000)	3.57^{**} (0.030)	8.17^{***} (0.000)	3.13^{**} (0.040)



Why low TFP firms? Approach and Results

Go Back

- Put TFP aside and analyze the diff. effect of CF on credit growth for other firm characteristics.
  - ▶ CF benefit more firms with higher collateral and risk (attributes prevalent in low TFP).

- TFP–Collateral and TFP–Risk dimensions, consecutively.
  - ▶ New nuances and not what classic risk-return trade-off would predict.

- TFP–Collateral–Risk, simultaneously.
  - ▶ CF seem to induce banks to expand relatively more credit to low TFP firms, because these firms are relatively riskier.
  - ▶ Risk-taking channel of CF.

Table. Debt Growth and Capital Inflows, TFP–Collateral–Risk (Altman's Z Score)

$Y = \Delta \ln(y_{i,t})$	**TFP**		**TFP–Collateral–Risk** (quad. interaction=0)		**TFP–Collateral–Risk** (8 categories)	
Cut-off for Collateral and Risk dummies	p50	p25-p75	p50	p25-p75	p50	p25-p75
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.28***	-0.48***	-0.20***	-0.21		
	(-4.92)	(-3.67)	(-3.44)	(-1.57)		
$D^{COL}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$			0.15***	-0.06		
			(2.60)	(-0.30)		
$D^{RISK}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$			0.49***	1.50***		
			(8.41)	(7.29)		
Test H0: H•• =L•• [TFP] (p-value)					**3.89*** (0.000)**	**0.73 (0.570)**
Test H0: •H• = •L• [COL] (p-value)					**2.70** (0.030)**	**0.50 (0.730)**
Test H0: ••H= ••L [RISK] (p-value)					**19.850*** (0.000)**	**14.210*** (0.000)**

A credit "misallocation"?

- Credit after CF go relatively more to low TFP firms that are *inefficiently over-resourced*.
- Still, by alleviating credit constraints, CF could enable low TFP firms that *may* be ex-ante more financially constrained to catch-up.
- We estimate with Diff. GMM the within-firm sensitivity of future TFP growth to debt change:

$$\Delta TFP_{i,t+1} = \rho_1 \Delta TFP_{i,t} + \rho_2 \Delta TFP_{i,t-1} + \psi \Delta Debt_{i,t} + \theta_l W^l_{i,t} + \alpha_i + \alpha_{c,t} + \epsilon_{i,t+1}$$

  - then differentiate positive from negative debt changes (Manaresi and Pierri, 2019)
  - further split the sample based on firm's initial TFP level

▶ Following an increase in credit, high TFP firms show the largest relative TFP acceleration.

▶ Confluence of results points to a credit misallocation induced by CF.

A credit "misallocation"?

Go Back

Table. Difference GMM: Sensitivity of TFP growth to Debt Change, Ex-ante High vs. Low TFP Firms

Δ*Debt defined as:*	**Panel A:** $\Delta \ln(Debt_{i,t})$				**Panel B:** $(\Delta Debt_{i,t})/(TotalAssets_{i,t-1})$			
Firm Samples:	All firms (1)	All firms (2)	Ex-ante High TFP (3)	Ex-ante Low TFP (4)	All firms (5)	All firms (6)	Ex-ante High TFP (7)	Ex-ante Low TFP (8)
Δ TFP$_{i,t}$	-0.171***	-0.171***	-0.140***	-0.200***	-0.167***	-0.166***	-0.136***	-0.193***
	(-49.50)	(-49.60)	(-29.98)	(-37.15)	(-52.90)	(-52.61)	(-31.82)	(-39.17)
Δ TFP$_{i,t-1}$	-0.058***	-0.058***	-0.046***	-0.059***	-0.057***	-0.057***	-0.047***	-0.055***
	(-21.69)	(-21.69)	(-12.62)	(-14.16)	(-23.37)	(-23.35)	(-13.97)	(-14.35)
Debt Chg$_{i,t}$	0.021***				0.146***			
	(24.74)				(28.19)			
◇ Debt Chg$_{i,t}^{+}$		0.002	**0.004***	**-0.001**		0.084***	**0.113***	**0.046***
		(1.14)	**(1.75)**	**(-0.29)**		(9.57)	**(9.71)**	**(3.51)**
◇ Debt Chg$_{i,t}^{-}$		0.042***	**0.042***	**0.041***		0.276***	**0.263***	**0.289***
		(20.70)	**(15.03)**	**(14.21)**		(17.82)	**(12.23)**	**(13.02)**
◇ Debt Chg$_{i,t}^{+\text{vs.}-}$		-0.040***	-0.038***	-0.042***		-0.193***	-0.151***	-0.243***
		(-14.03)	(-9.78)	(-10.07)		(-10.13)	(-5.80)	(-8.72)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Country-Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Observations	353491	353491	195385	158106	426201	426201	234806	191395
Number of firms	111133	111133	63958	58513	132088	132088	76095	70011
AR test, order 1 (p-val)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AR test, order 2 (p-val)	0.164	0.156	0.723	0.019	0.043	0.038	0.090	0.144
Hansen J-Test (p-val)	0.009	0.012	0.081	0.152	0.001	0.001	0.008	0.161

Does the direction of non-resident flows matter?

Go Back

- Allow the differential effect to differ between non-resident inflows and outflows episodes.
- ▶ The differential effects are symmetric and strong for both type of episodes, albeit larger for outflows at shorter lags.
- Results on capital outflows could be symptomatic of zombie lending.

Table. Firm's Debt Growth and Capital Inflows, Positive versus Negative Inflows [excerpt]

Margin Changes & Dependent Variable:	**Panel A: Intensive** $\Delta \ln(y_{i,t})$			**Panel B: Intensive + Extensive** $(y_{i,t}-y_{i,t-1})/(0.5(y_{i,t}+y_{i,t-1}))$			**Panel C: Intensive + Extensive** $(\Delta y_{i,t})/(TotalAssets_{i,t-1})$		
CF timing K:	t	MAt,t-1	MAt,t-2	t	MAt,t-1	MAt,t-2	t	MAt,t-1	MAt,t-2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$D^{TFP}_{i,t-1} \times CF_{c,K}{}^{OUT-IN}$	-0.244**	-0.338**	-0.031	-0.458***	-0.218	0.089	-0.027	-0.042*	-0.005
	(-2.16)	(-2.36)	(-0.18)	(-2.77)	(-1.09)	(0.37)	(-1.53)	(-1.70)	(-0.17)
$D^{TFP}_{i,t-1} \times CF_{c,K}{}^{IN}$	-0.296***	-0.344***	-0.390***	-0.406***	-0.466***	-0.504***	-0.057***	-0.062***	-0.076***
	(-4.59)	(-4.95)	(-5.05)	(-4.80)	(-5.08)	(-5.05)	(-5.73)	(-5.88)	(-6.32)
$D^{TFP}_{i,t-1} \times CF_{c,K}{}^{OUT}$	-0.540***	-0.682***	-0.422***	-0.864***	-0.684***	-0.415*	-0.083***	-0.104***	-0.081***
	(-5.43)	(-5.37)	(-2.64)	(-5.77)	(-3.67)	(-1.80)	(-5.55)	(-4.79)	(-3.01)
$Firm\ Controls_{i,t-1}$	yes	yes	yes	yes	yes	yes	yes	yes	yes
Fixed Effects: $i, s\times t, c\times t, c\times s$	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	826217	826217	826217	1022273	1022273	1022273	1022273	1022273	1022273
% Extensive changes	0%	0%	0%	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%
Number of firms	183521	183521	183521	222376	222376	222376	222376	222376	222376
Within Adj. R^2	0.024	0.024	0.024	0.017	0.017	0.017	0.047	0.048	0.048

Is it an issue specific to emerging economies?

Go Back

- Contrasts from a sample of 10 advanced European countries
- Use WLS to mitigate issues of panel unbalancedness and within-country representativeness. e.g. by replicating the size and sectoral structure of the actual pop. in each $c \times t$

▶ Differential effects smaller in Adv10 and limited to episodes of capital outflows.

Table. Contrasts betwen CEE12 and Adv10 Samples, WLS results, I+E margins (using $\Delta y_{i,t} / TotalAssets_{i,t-1}$) [excerpt]

Country coverage:	**Emerging Countries (CEE12)**					**Advanced Countries (Adv10)**				
Weighting Schemes:	No	No	ctry×year	empl	turnover	No	No	ctry×year	empl	turnover
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}$	-0.063***					-0.013***				
	(-7.38)					(-5.86)				
$D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}{}^{OUT - IN}$		-0.005	0.014	0.032	0.000		-0.025***	-0.049***	-0.053***	-0.043***
		(-0.17)	(0.41)	(0.46)	(0.00)		(-3.47)	(-3.92)	(-4.69)	(-4.41)
$\diamond D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}{}^{IN}$		-0.076***	-0.090***	-0.092***	-0.077***		-0.004	-0.002	0.002	0.000
		(-6.32)	(-6.79)	(-3.65)	(-4.90)		(-1.13)	(-0.29)	(0.40)	(-0.04)
$\diamond D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}{}^{OUT}$		-0.081***	-0.077**	-0.060	-0.077*		-0.028***	-0.051***	-0.051***	-0.043***
		(-3.01)	(-2.44)	(-0.88)	(-1.69)		(-4.27)	(-4.55)	(-5.04)	(-4.87)
Firm Controls$_{i,t-1}$ + Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1022273	1022273	1022273	1022273	1022273	6306073	6306073	6306073	6306073	6306073
◇ % Extensive changes	16.6%	16.6%	16.6%	16.6%	16.6%	13.8%	13.8%	13.8%	13.8%	13.8%
Number of firms	222376	222376	222376	222376	222376	1173633	1173633	1173633	1173633	1173633
Dep. var. avg;p50 (in %)	1.4;-0.3	1.4;-0.3	1.4;-0.3	1.4;-0.3	1.4;-0.3	0.8;-0.7	0.8;-0.7	0.8;-0.7	0.8;-0.7	0.8;-0.7

Robustness: CF variables

Go Back

- Construct measures on cross-border banking inflows from the BIS.
- Isolate the supply-side component of CF: for each c, run $CF_{c,t} = \alpha_c + \lambda_c CF_t^{World} + \epsilon_{c,t}$.

▶ Global flows raise relatively more the credit growth of low TFP firms.

Table. Robustness, Alternative Capital Inflows Variables (Intensive Margin)

Dependent variable: $\Delta \ln(y_{i,t})$ *Note: reported coefficients multiplied by one SD of CF*

Data Source:	BOP-based		BIS-based				BOP	BIS
Capital Inflows Type:	CF Total Debt **Baseline**	Other Invest.	ΔXBC all sectors (LBSR)	ΔXBC private (LBSR)	ΔFC private (CBS)	$\Delta LCLC$ private (CBS)	**Supply-driven** $\hat{\lambda}_c$ CF^{World}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$D^{TFP}_{i,t-1} \times CF_{c,t}$	-0.707***	-0.844***	-0.504**	-0.595***	-0.886***	-0.293	-1.220***	-0.589***
	(-3.00)	(-3.60)	(-2.39)	(-2.76)	(-4.36)	(-1.34)	(-5.47)	(-3.05)
$D^{TFP}_{i,t-1} \times CF_{c,MAt,t-1}$	-1.138***	-1.243***	-0.743***	-0.827***	-0.832***	-0.539**	-1.278***	-0.556***
	(-4.59)	(-5.01)	(-3.29)	(-3.53)	(-3.82)	(-2.40)	(-5.33)	(-2.71)
$D^{TFP}_{i,t-1} \times CF_{c,MAt,t-2}$	-1.390***	-1.456***	-1.044***	-1.131***	-1.066***	-0.683***	-1.652***	-0.911***
	(-5.42)	(-5.65)	(-4.47)	(-4.79)	(-4.87)	(-3.08)	(-6.38)	(-4.03)
Firm Controls$_{i,t-1}$	yes	yes	yes	yes	yes	yes	yes	yes
Fixed Effects: $i,s\times t,c\times t,c\times s$	yes	yes	yes	yes	yes	yes	yes	yes
Observations	826217	826217	826217	826217	826217	818100	826217	826217
Number of firms	183521	183521	183521	183521	183521	182801	183521	183521

Robustness: Productivity proxies

Go Back

- Is it an allocation away from firms with high technical efficiency? Or rather firms with high markup/profitability?

- Consistent results with a revenue TFP proxy purged from estimated firm- and time-varying markups (De Loecker and Warzynski, 2012).

- Also confirm that firms with high MRP^K experience a smaller credit growth, despite facing larger credit frictions.

Table. Robustness, Alternative Productivity Variables (Intensive Margin)

Dependent variable: $\Delta \ln(y_{i,t})$					
Productivity Variable	$TFPR$ **Baseline**	$TFPR$ (4-dig. sectors pooled)	LP	$TFPR^C$ (markup adjusted)	MRP^K (markup adjusted)
	(1)	(2)	(3)	(4)	(5)
Panel A: TFP cutoff, p50					
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.276***	-0.246***	-0.130***	-0.239***	-0.254***
	(-5.42)	(-4.98)	(-2.80)	(-4.14)	(-4.56)
Observations	826217	828654	816533	716796	745337
Number of firms	183521	183593	182490	160357	162995
Panel B: TFP cutoff, p25–p75					
$D^{TFP}_{i,t-1} \times \text{CF}_{c,MAt,t-2}$	-0.454***	-0.518***	-0.242***	-0.422***	-0.356***
	(-5.25)	(-5.76)	(-2.98)	(-4.43)	(-3.68)
Observations	401762	405032	396328	351550	360796
Number of firms	104075	103794	104471	90865	92750
Firm Controls$_{i,t-1}$	yes	yes	yes	yes	yes
FE: $i, s\times t, c\times t, c\times s$	yes	yes	yes	yes	yes

Comment: Local projection approach

- Explore the dynamic impact of capital inflows on the efficiency of credit allocation. β might gradually turn negative.
  - ↳ $\sum_{q=0}^{2} \beta_q$, hard to interpret each β_q

Alternative: panel OLS local projection à la Jordà (2005)

$$\begin{aligned}\tilde{y}_{i,t+h} &= \ln(y_{i,t+h}) - \ln(y_{i,t-1}) \\ &= \alpha_i^h + \alpha_{s,c,t+h}^h + \boldsymbol{\beta}^h \left(D_{i,t-1}^{TFP} \times CF_{j,t}\right) + \gamma D_{i,t-1}^{TFP} + \theta_l Controls_{i,t}^l + \epsilon_{i,t+h}, \\ &\quad \text{for each } h = 0, 1, 2, 3\end{aligned}$$

where *Controls* includes 2 lags of $\tilde{y}_{i,t+h}$ and $CF_{j,t}$, and our firm controls $X_{i,t-1}^l$.

data more demanding.

$CF_{j,t}$ should it be a strictly exogenous shock?

Nickell bias might be a problem with small T.

Brandao-Marques, Luis, Qianying Chen, Claudio Raddatz, Jérôme Vandenbussche, and Peichu Xie. 2019. "The Riskiness of Credit Allocation and Financial Stability." IMF Working paper No 19/207.

Cantú, Carlos, Fernando Chertman, Toni Santos, Rodrigo Alfaro, Facundo Luna, Miguel Sarmiento, Roberto Lobato, Calixto Lopez, Gerald Cisneros, and Rafael Nivin. 2022. "Capital inflows and credit supply in Latin America." In *Changing patterns of capital flows*. Chapter Annex C6, 89–91. CGFS Papers No 66, Bank for International Settlements.

Cingano, Federico, and Fadi Hassan. 2020. "International financial flows and misallocation." CEP Discussion Paper, LSE No 17186.

di Giovanni, Julian, Şebnem Kalemli-Özcan, Mehmet Fatih Ulu, and Yusuf Soner Baskaya. 2021. "International Spillovers and Local Credit Cycles." *Review of Economic Studies*, 89(2): 733–773.

Dinger, Valeriya, and Daniel M te Kaat. 2020. "Cross-Border Capital Flows and Bank Risk-Taking." *Journal of Banking & Finance*, 117(105842).

Gopinath, Gita, Şebnem Kalemli-Özcan, Loukas Karabarbounis, and Carolina Villegas-Sanchez. 2017. "Capital allocation and productivity in South Europe." *Quarterly Journal of Economics*, 132(4): 1915–1967.

Greenwood, Robin, and Samuel G Hanson. 2013. "Issuer quality and corporate bond returns." *Review of Financial Studies*, 26(6): 1483–1525.

Hsieh, Chang-Tai, and Peter J Klenow. 2009. "Misallocation and manufacturing TFP in China and India." *Quarterly Journal of Economics*, 124(4): 1403–1448.

International Monetary Fund, IMF. 2018. "Global Financial Stability Report: A Bumpy Road Ahead." IMF Publications (Washington DC: 2018).

Jordà, Òscar. 2005. "Estimation and inference of impulse responses by local projections." *American Economic Review*, 95(1): 161–182.

Karolyi, George Andrew, John Sedunov, and Alvaro G Taboada. 2018. "Cross-border bank flows and systemic risk." Asian Bureau of Finance and Economic Research Working Paper.

Larrain, Mauricio, and Sebastian Stumpner. 2017. "Capital account liberalization and aggregate productivity: The role of firm capital allocation." *Journal of Finance*, 72(4): 1825–1858.

Reis, Ricardo. 2013. "The Portuguese Slump and Crash and the Euro Crisis." *Brookings Papers on Economic Activity*, 2013(1): 143–210.

te Kaat, Daniel M. 2021. "Cross-Border Debt Flows and Credit Allocation: Firm-Level Evidence from the Euro Area." *Journal of Money, Credit and Banking*, 53: 1797–1818.