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Chinese Corporate Leverage

ROLE OF INTERNALLY FINANCED CAPEX

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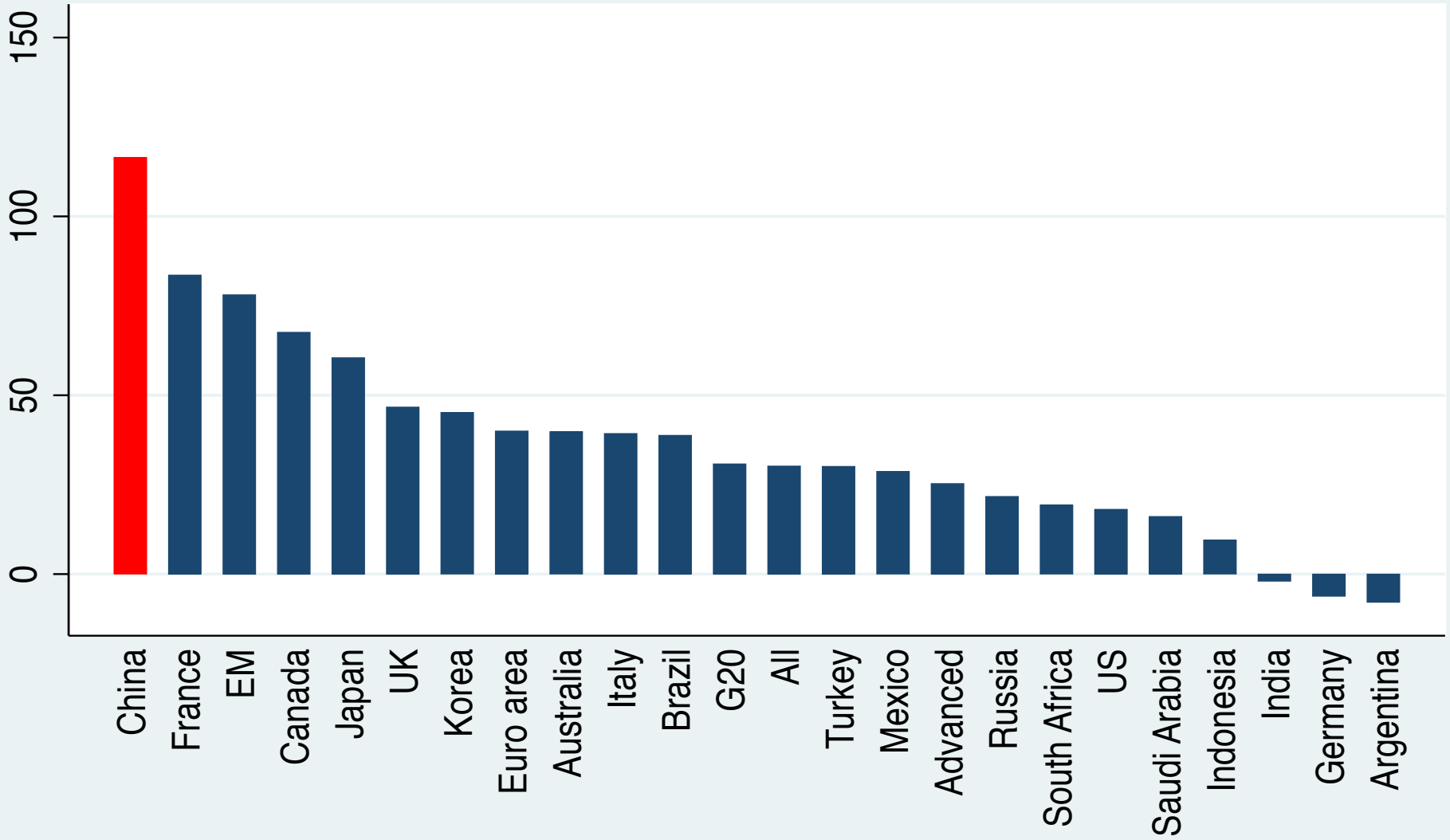
OUTLINE AND TAKEAWAYS

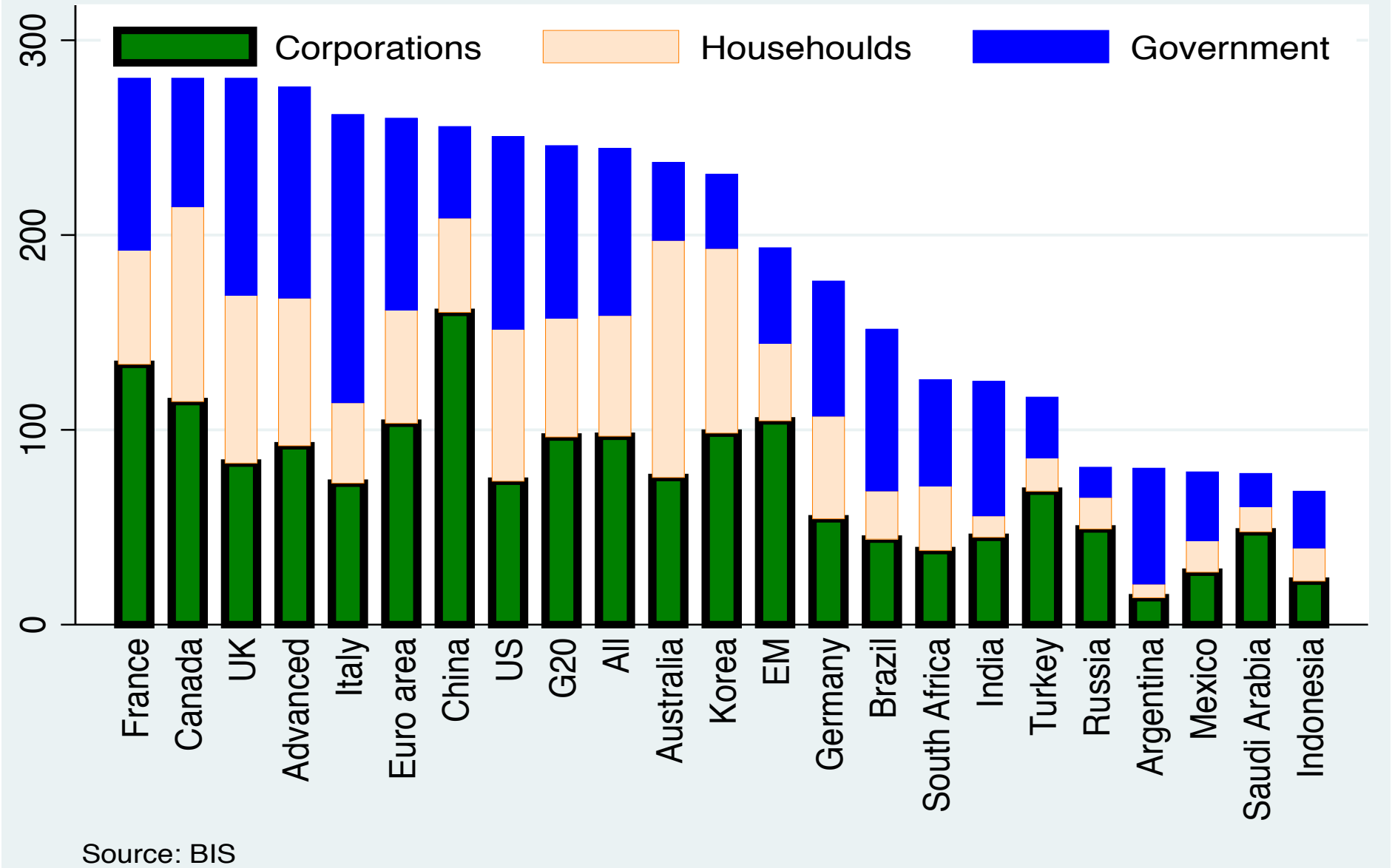
- **Motivations**
  - ✓ Corporate debt surged in China and globally
- **Empirical analysis**
  - ✓ The role of the share of *internally financed capital expenditure* (**IFCE**) in corporate leverage
  - ✓Four simple benchmarks with a host of control variables
- **Main findings: takeaways**
  - ➢ A higher ratio of corporate earnings over capex (**IFCE**) significantly slows corporate debt buildup
  - ➢ A central finding robust to specifications and controls
  - ➢ Gov't debt also negatively influences corporate leverage

CHANGE OF ALL DEBT TO THE NON-FINANCIAL SECTOR, % OF GDP (2008Q1-2018Q1)



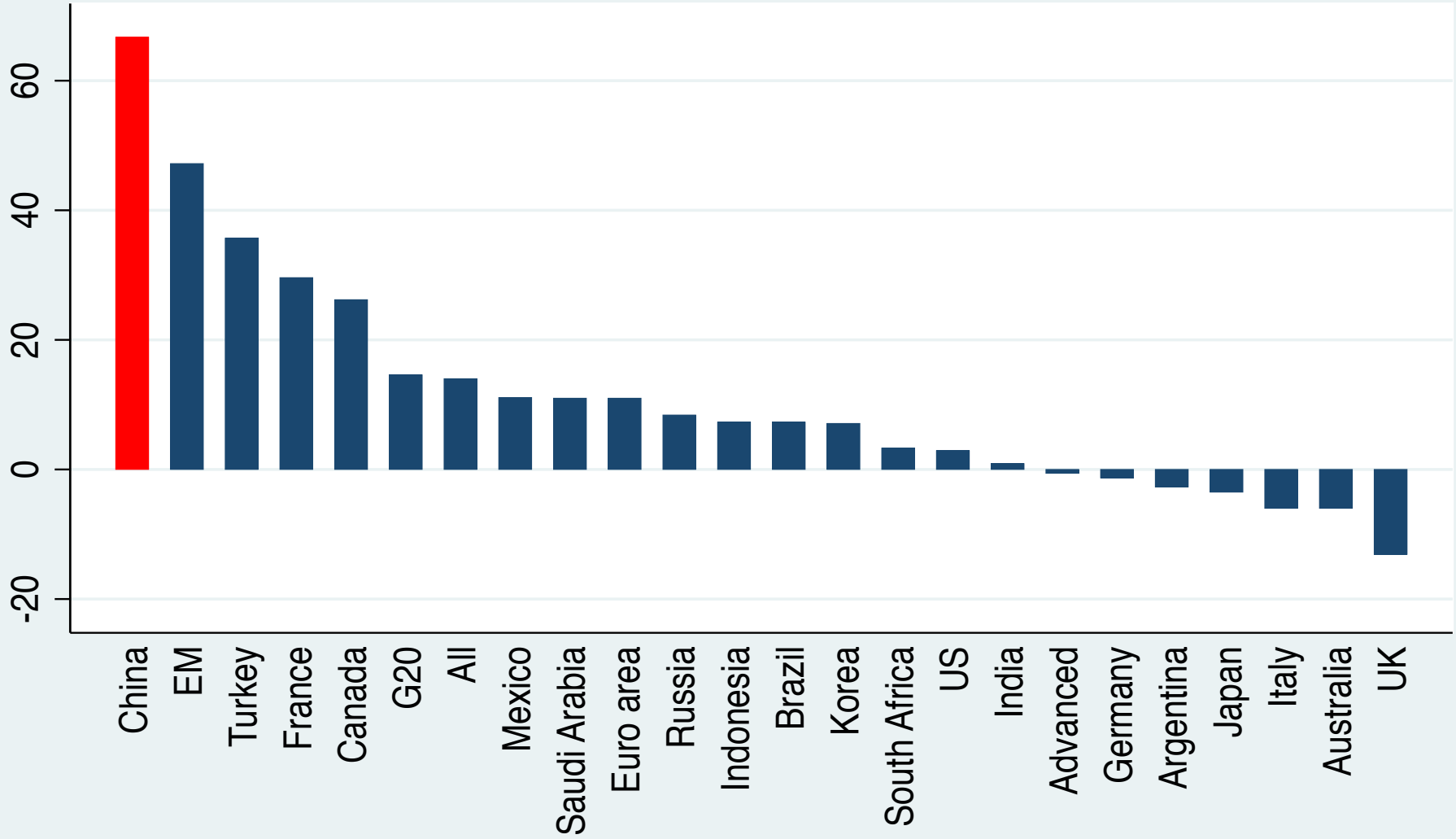
Source: BIS and authors' calculation

TOTAL DEBT TO THE NON-FINANCIAL SECTOR, % OF GDP (END 2017)



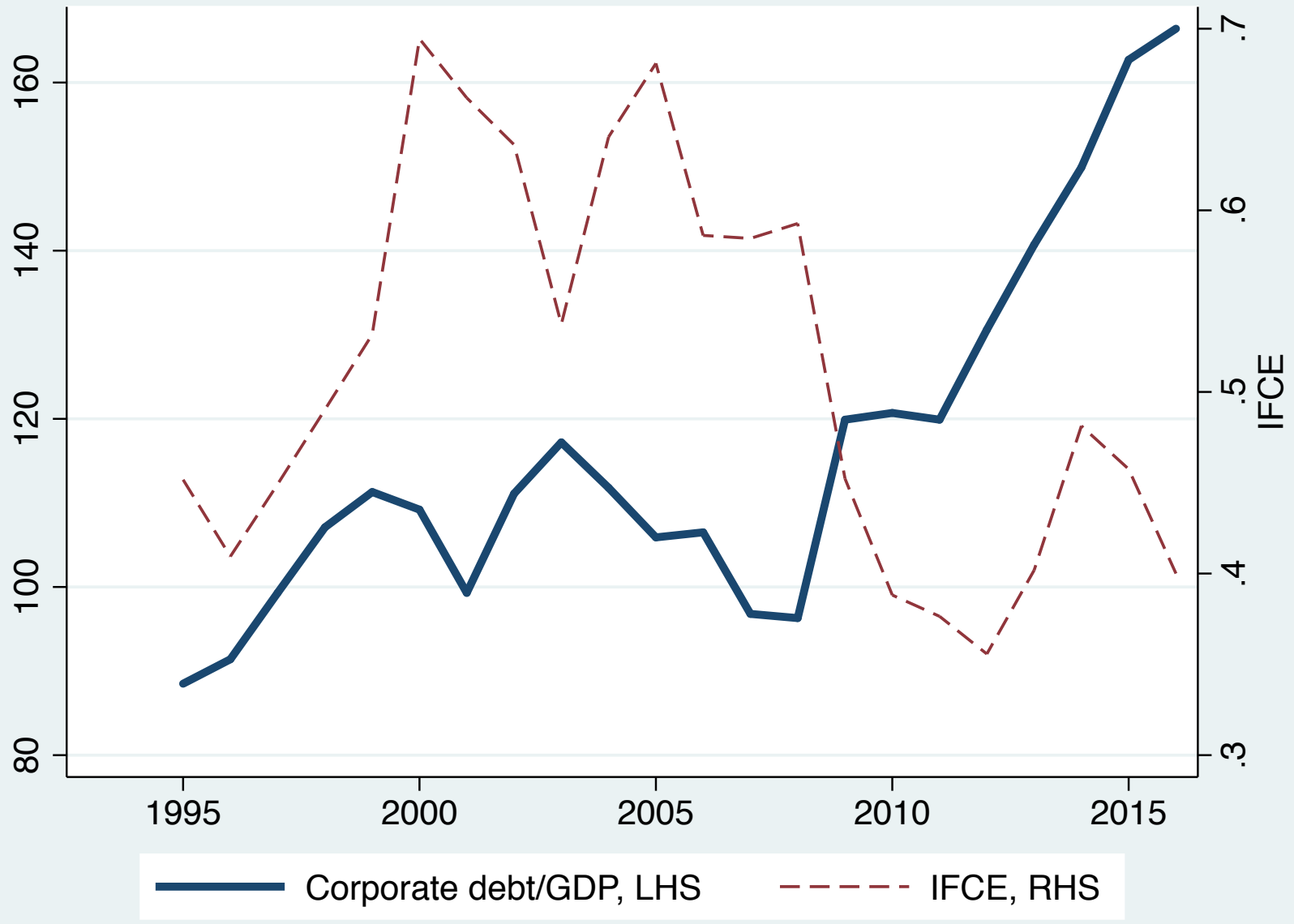
Source: BIS

CHANGE OF CORPORATE DEBT, % OF GDP (2008Q1-2018Q1)



Source: BIS and authors' calculation

CORPORATE DEBT/GDP AND INTERNALLY FINANCED CAPITAL EXPENDITURE



MAIN FINDINGS

1. Robust and strong evidence of negative and significant impact of **IFCE** on change in corporate debt

2. Real economic factors matter more than monetary factors (growth, PPP, investment rate).

3. Investment rate contributes to corporate leverage, but saving rate actually dampens it.

4. Tentative evidence on consistently negative effects of government debt on corporate leverage: interactions?

3. EMPIRICAL ANALYSIS: BASELINE SPECIFICATION

$$CorpDebt = c + \lambda_1 IFCE + \lambda_2 GovDebt + \lambda_3 Crisis + \lambda_4 IFCE \times Crisis + \beta \cdot \theta + \epsilon$$

- CorpDebt: *Corporate debt, % of GDP*
- IFCE: *Ratio of corporate earnings over capital formation*
- GovDebt: *Government debt, % of GDP*
- Crisis dummy and interaction with IFCE
- Other control variables
  - *Group I: domestic real economic factors*
  - *Group II: global and monetary factors*

3. EMPIRICAL ANALYSIS: 4 BENCHMARKS

$$\Delta CorpDebt_{i,t} = c + \lambda_1 IFCE_{i,t} + \lambda_2 \Delta GovDebt_{i,t-1} + \lambda_3 Crisis + \lambda_4 IFCE_{i,t} \times Crisis + \beta\theta_{i,t} + f_i + \epsilon_{i,t} \quad (A)$$

$$\Delta CorpDebt_{i,t} = c + \lambda_1 IFCE_{i,t} + \lambda_2 \Delta GovDebt_{i,t-1} + \lambda_3 Crisis + \beta\theta_{i,t} + f_i + \epsilon_{i,t} \quad (B)$$

$$\Delta CorpDebt_{i,t} = c + \lambda_1 IFCE_{i,t} + \lambda_3 Crisis + \lambda_4 IFCE_{i,t} \times Crisis + \beta\theta_{i,t} + f_i + \epsilon_{i,t} \quad (C)$$

$$\Delta CorpDebt_{i,t} = c + \lambda_1 IFCE_{i,t} + \lambda_3 Crisis + \beta\theta_{i,t} + f_i + \epsilon_{i,t} \quad (D)$$

TABLE 1: FOUR BASIC BENCHMARKS (NO Θ)

	A	B	C	D
IFCE	-4.111***	-4.484***	-5.231***	-5.676***
Lagged ΔGovDebt	-0.122***	-0.125***		
Crisis	5.626**	3.255***	5.646**	2.976***
IFCExCrisis	-2.336		-2.625	
Constant	5.513***	5.878***	6.478***	6.910***
N	468	468	468	468
R2	0.082	0.080	0.067	0.064
R2_a	0.030	0.030	0.017	0.016

TABLE 2: DOMESTIC REAL ECONOMIC FACTORS (A)

	A1	A2	A3	A4	A5
IFCE	-4.167***	-4.177***	-2.334	-4.997***	-3.973**
Lagged ΔGovDebt	-0.126***	-0.115**	-0.097**	-0.114**	-0.077
Growth	-0.060				-1.244***
ΔPPP		0.000			0.003***
Invest			0.249**		0.400***
ΔIndustry				0.365	0.471
Crisis	5.524**	5.774**	5.766**	5.260**	4.920**
IFCExCrisis	-2.389	-2.205	-2.508	-1.862	-1.881
Constant	5.736***	5.385***	-2.222	6.486***	-2.627
N	468	468	468	463	463
R2	0.082	0.083	0.090	0.089	0.128
R2_a	0.028	0.029	0.036	0.035	0.069

TABLE 3: DOMESTIC REAL ECONOMIC FACTORS (B)

	B1	B2	B3	B4	B5
IFCE	-4.541***	-4.533***	-2.773*	-5.323***	-4.351**
Lagged ΔGovDebt	-0.128***	-0.117**	-0.101**	-0.115**	-0.078*
Growth	-0.054				-1.250***
ΔPPP		0.000			0.003***
Invest			0.243*		0.394***
ΔIndustry				0.382	0.480
Crisis	3.116***	3.560***	3.222***	3.377***	3.031***
Constant	6.085***	5.718***	-1.658	6.807***	-2.120
N	468	468	468	463	463
R2	0.080	0.081	0.083	0.088	0.144
R2_a	0.028	0.029	0.031	0.035	0.088

TABLE 4: GLOBAL & MONETARY FACTORS (A)

	A1	A2	A3	A4	A5	A6
IFCE	-4.312***	-4.088***	-3.910***	-4.219***	-4.102***	-4.248***
Lagged ΔGovDebt	-0.120***	-0.123***	-0.119**	-0.126***	-0.122***	-0.118**
Globalgrowth	-0.395*					-0.430
ΔUSDNEER		0.021				-0.038
ΔG3Rate			-0.392			-0.443
BondRate				-0.128		-0.139
Debt2Equity					0.053	0.007
Crisis	4.951**	5.730**	5.265**	5.660**	5.617**	4.326*
IFCExCrisis	-2.340	-2.391	-2.164	-2.403	-2.346	-2.115
Constant	6.967***	5.457***	5.268***	6.243***	5.390***	7.677***
N	468	468	468	444	468	444
R2	0.088	0.082	0.083	0.087	0.083	0.095
R2_a	0.034	0.028	0.029	0.030	0.028	0.030

TABLE 5: GLOBAL & MONETARY FACTORS (B)

	B1	B2	B3	B4	B5	B6
IFCE	-4.685***	-4.472***	-4.231***	-4.630***	-4.477***	-4.583***
Lagged ΔGovDebt	-0.123***	-0.125***	-0.121***	-0.128***	-0.125***	-0.119**
Globalgrowth	-0.394*					-0.431
ΔUSDNEER		0.017				-0.042
ΔG3Rate			-0.435			-0.496
BondRate				-0.131		-0.147
Debt2Equity					0.052	0.010
Crisis	2.578***	3.295***	3.048***	3.209***	3.236***	2.133**
Constant	7.332***	5.838***	5.577***	6.669***	5.759***	8.043***
N	468	468	468	444	468	444
R2	0.085	0.080	0.081	0.084	0.080	0.093
R2_a	0.034	0.028	0.029	0.029	0.028	0.030

TABLE 6: ALL FACTORS COMBINED

	A	B	C	D
IFCE	-3.899**	-4.332**	-4.102**	-4.565**
Lagged ΔGovDebt	-0.057	-0.059		
Growth	-1.314***	-1.312***	-1.340***	-1.338***
ΔPPP	0.003***	0.003***	0.004***	0.004***
Invest	0.429***	0.415***	0.476***	0.463***
ΔIndustry	0.414	0.425	0.421	0.432
Globalgrowth	-0.694**	-0.706**	-0.755**	-0.770**
ΔUSDNEER	-0.044	-0.049	-0.050	-0.055
ΔG3Rate	-0.339	-0.385	-0.367	-0.417
Bondrate	-0.014	-0.022	-0.006	-0.013
Debt2Equity	0.002	0.003	0.006	0.008
Crisis	4.089	2.083**	4.040	1.923**
IFCExCrisis	-1.940		-2.043	
Constant	-1.371	-0.556	-2.214	-1.381
N	441	441	441	441
R2	0.151	0.149	0.146	0.144
R2_a	0.080	0.080	0.076	0.077

TABLE 7: ONLY SIGNIFICANT CONTROLS

	A	B	C	D
IFCE	-3.527**	-3.913**	-3.836**	-4.253***
Lagged ΔGovDebt	-0.063	-0.065		
Growth	-1.204***	-1.210***	-1.235***	-1.243***
ΔPPP	0.003***	0.003***	0.004***	0.004***
Invest	0.395***	0.390***	0.437***	0.432***
Globalgrowth	-0.571**	-0.580**	-0.620**	-0.630**
Crisis	4.684**	2.622***	4.668**	2.490***
IFCExCrisis	-2.047		-2.160	
Constant	-1.799	-1.272	-2.436	-1.898
N	468	468	468	468
R2	0.132	0.131	0.129	0.127
R2_a	0.075	0.075	0.073	0.073

TABLE 8: ALTERNATIVE CRISIS DUMMY

	A	B	C	D
IFCE	-5.152***	-4.011**	-5.409***	-4.304***
Lagged ΔGovDebt	-0.061	-0.058		
Growth	-1.132***	-1.098***	-1.168***	-1.135***
ΔPPP	0.003***	0.003***	0.003***	0.003***
Invest	0.466***	0.431***	0.502***	0.467***
Globalgrowth	-0.745***	-0.752***	-0.786***	-0.791***
Crisis	-1.022	1.132*	-1.008	1.059*
IFCExCrisis	2.244		2.151	
Constant	-1.695	-1.896	-2.250	-2.421
N	468	468	468	468
R2	0.123	0.120	0.120	0.117
R2_a	0.065	0.064	0.064	0.063

TABLE 9: SAVING REPLACING INVESTMENT

	A	B	C	D
IFCE	-6.023***	-6.351***	-7.000***	-7.338***
Lagged ΔGovDebt	-0.111**	-0.112**		
Growth	-0.907***	-0.919***	-0.924***	-0.936***
ΔPPP	0.003***	0.003***	0.003***	0.003***
SavingRate	-0.138	-0.129	-0.066	-0.057
Globalgrowth	-0.600**	-0.606**	-0.664**	-0.670**
Crisis	4.943**	2.980***	4.788**	2.783***
IFCExcrisis	-1.942		-1.983	
Constant	13.340***	13.452***	12.433***	12.544***
N	468	468	468	468
R2	0.117	0.115	0.106	0.105
R2_a	0.059	0.059	0.049	0.050

CONCLUSIONS AND FUTURE WORKS

- Strong and robust evidence that internally financed capex negatively and significantly affects corporate leverage.
- Tentative evidence of negative effects of government debt on corporate leverage, suggesting their possible interactions.
- Real economic factors matter more than monetary factors
- Investment strongly drives up corporate debt, while higher saving actually dampens corporate leverage
- Efficiency of investment is central to corporate deleveraging
  - Both higher IFCE and lower required investment slow corporate debt
- Work still in progress --- future works ahead
  - Additional control variables to be considered
  - Other estimators: e.g. System-GMM estimator