

CORPORATE FINANCIAL STRUCTURE AND FINANCIAL STABILITY

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Abstract

- This paper examines how corporate sector behaviour shapes the impact of a financial crisis on the real sector. It is one of the first papers to utilize extensive cross country flow and balance sheet data as well as in examining subcomponents of GDP in the wake of banking and currency crises. Background is provided by the literature on corporate finance and financial instability, and by stylized differences in average patterns of corporate financing between advanced countries and EMEs. Meanwhile investment and inventory contractions are shown to be the main contributors to lower GDP growth after crises.

- Statistically, there is a marked correlation of the debt/equity ratio to investment and inventory declines following crises. Econometric analysis suggests that financial crises have a greater and more consistently negative impact on expenditure and finance of corporate sectors in EMEs, and this is partly related to balance sheet variables. OECD countries benefit from multiple channels of intermediation, in that bond issuance picks up in the wake of crises. Although EME corporates hold more precautionary liquidity, this is not sufficient to prevent a greater amplitude of response of expenditure to shocks. There are important implications for policy, notably a need for a greater focus on the corporate sector per se and its financing in particular during macroprudential analysis.

Structure of paper

- Introduction
- Literature review
- The data and corporate financial structure
- Corporate financial structure and financial stability – descriptive analysis
- Econometric analysis
- Conclusions

Introduction

- Dimensions of corporate financing
 - Depth – quantity of financing available
 - Breadth – variety of financing options (loans, bonds, shares, trade credit – and liquidity)
- Measure implications of structure for fragility via:
 - Measuring real expenditure responses to banking and currency crises and variation therein linked to balance sheet indicators
 - Examining shifts in size and composition of corporate financing during a crisis, controlling for normal cyclical changes (shifts may link to supply-side, i.e. rationing of finance or demand-side, i.e. corporate balance sheet adjustment)

Literature review

- General determinants of corporate financial structure
 - Exceptions to Modigliani-Miller – costs of bankruptcy versus tax benefits to debt
 - Asymmetric information and higher cost of external financing (issue how well financial system deals with agency costs)
- Economic and financial development
 - Overall development of financial services important to growth - and not bias to bank or market financing?
 - Stages of development in financial systems – stock and bond markets come later than banks. Legal aspects important

- Financial effects on the business cycle
 - Financial accelerator and effect of net worth (debt/equity ratio) on availability of external finance
 - Credit channel and specialness of bank finance (bank debt/total debt ratio)
- Recent theories of financial crises
 - Introduction of banks and liquidity effects into most recent models
 - Collateral effects and micro and macroeconomic rigidities
 - Financial breadth (“multiple avenues”) and the impact of crises on expenditures
- Empirical work on post crisis output contractions
- Macroprudential indicators of corporate sector fragility

Data and corporate financial structure

- Stylised facts regarding balance sheets consistent with theory
 - Larger balance sheet size in OECD countries – regardless of bank or market orientation
 - Banks more important in EMEs – less internal cash flow and less developed securities markets
 - Higher liquidity in EMEs (less availability of external finance) and also more trade credit (supplier ability to overcome agency costs)
 - But no pattern for debt/equity ratio
 - Trend for rise in overall size of balance sheet, and for debt/equity to decline

Balance sheet summary, 1999

	Total corporate liabilities to GDP	Shares of corporate liabilities				Debt-equity ratio	Liquidity ratio	Debt-GDP ratio
		Loans	Bonds	Equity	Trade			
<i>Median</i>								
G7 countries	2.48	0.23	0.08	0.63	0.06	0.59	0.21	0.50
Small industrial countries	1.96	0.30	0.04	0.57	0.08	0.61	0.26	0.76
Emerging market	1.75	0.27	0.21	0.40	0.14	0.73	0.42	0.66
<i>Standard deviation</i>								
G7 countries	0.80	0.15	0.06	0.16	0.07	0.52	0.39	0.21
Small industrial countries	1.00	0.15	0.03	0.16	0.04	1.05	0.07	0.13
Emerging market	0.51	0.17	0.16	0.23	0.42	1.59	0.50	0.37

- Flow aspects
 - External finance/GDP greatest for EMEs
 - Security financing largest for OECD countries in 1995-99 – also large in EMEs
 - Liquidity accumulation lowest in OECD, highest for EMEs
 - Gross financing declining for OECD (rising internal funds generation) but rising sharply for EMEs
 - Trend for securities to increase share of total financing and loans to diminish

Flow of funds summary

1995-99	Net financing	Gross financing	Share of total financing			Liq accum
	to GDP	to GDP	Loans	Bonds	Equities	to GDP
<i>Median</i>						
G7 countries		3.4	34.5	24.0	41.2	0.6
Small industrial countries	-0.2	5.3	54.3	10.1	35.8	1.2
Emerging market countries	-11.7	18.6	44.9	21.5	26.9	1.7

Gross financing-GDP	1970-79	1980-89	1990-99	1995-99
<i>Median</i>				
G7 countries	8.3	7.0	4.5	3.4
Small industrial countries				5.3
Emerging market countries	6.3	6.3	18.3	18.6

Descriptive analysis of crises, growth and investment

- Standard set of banking and currency crises (Eichengreen and Bordo 2002) – 59 events for 29 countries, 17 in EMEs, 18 banking crises and four twin crises
- Methodology is to measure effects as deviation of contribution to GDP from trend effect over 11 years in t and $t+1$
- Larger impact of crises on EMEs GDP – mainly accounted for by domestic demand and corporate investment expenditures and inventory decumulation therein. Consumption relatively robust and external demand expands

Impact of crises on GDP

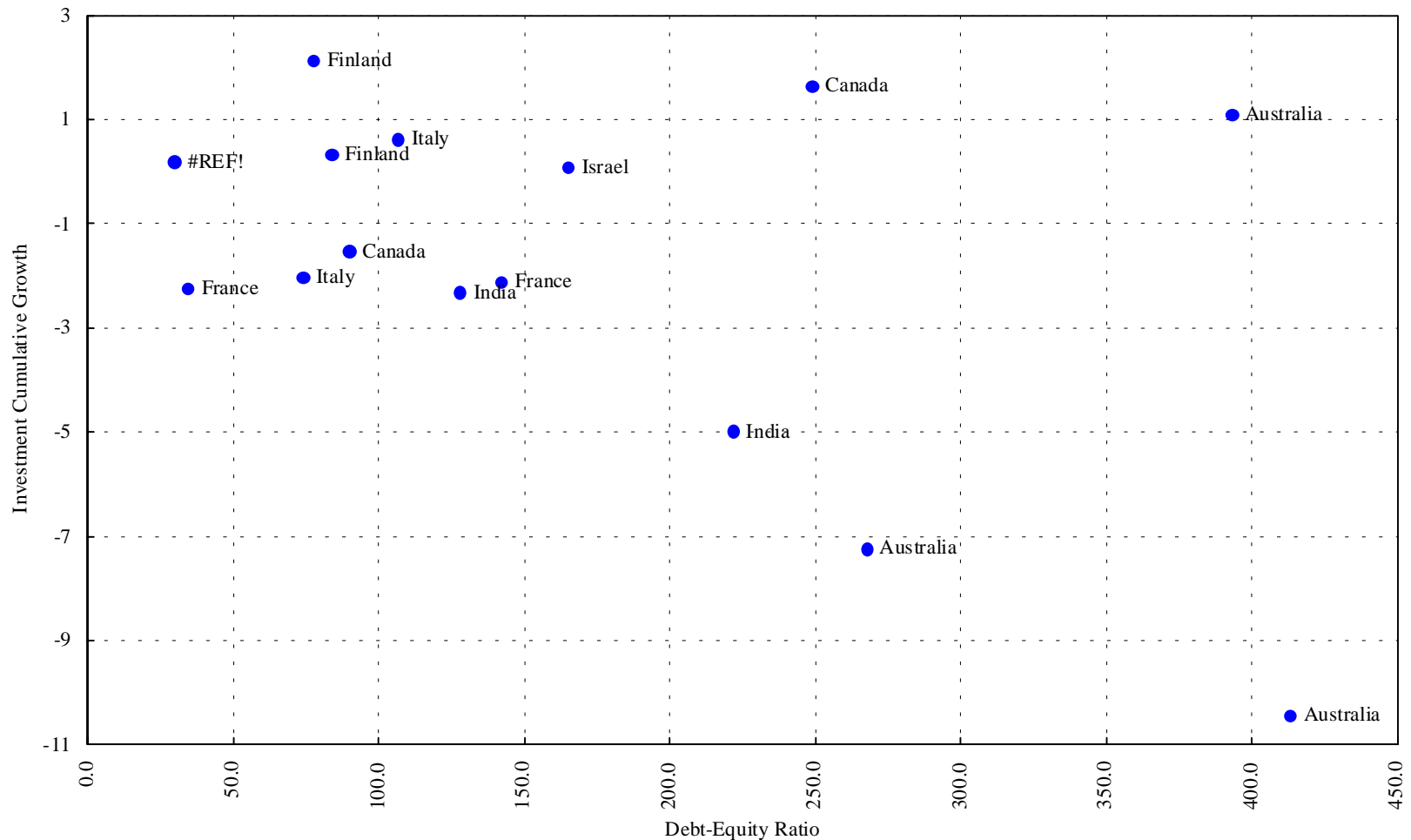
Percent		GDP	Total domestic demand	Total public domestic demand	Total private domestic demand	Private consumption	Private investment	Change in inventories	Foreign balance
Total	average	-1.5	-2.6	0.1	-2.9	-0.7	-1.7	-0.4	1.1
	median	-1.0	-1.1	-0.1	-1.8	-0.7	-1.1	0.0	0.5
EME	average	-3.2	-6.4	-0.4	-5.6*	-1.3	-3.2*	-1.1	2.7
	median	-3.3	-4.3	-0.3	-4.1*	-2.0	-1.9*	-0.1	1.6
OECD	average	-0.9	-1.5	0.2	-2.0	-0.5	-1.3	-0.1	0.6
	median	-0.2	-0.7	-0.1	-0.9	-0.5	-0.4	0.1	0.4
Currency	average	-1.1	-1.9	-0.1	-2.0	-0.5	-1.2	-0.3	1.0
	median	-0.2	-0.7	-0.1	-0.9	-0.5	-0.4	0.0	0.5
Banking	average	-3.1	-5.1	0.2	-5.0	-1.4	-3.1	-0.4	1.9
	median	-2.8	-4.1	0.3	-4.0	-0.8	-3.1	-0.1	1.6

Indicators of financial structure and crises

- Size of balance sheets per se is unrelated to expenditure response...
- ...but marked impact of corporate leverage on investment and inventory contraction
- Falls in flows of external finance mainly in bank loans and liquidity falls while bond issues rise. Falls in external finance and bank lending larger for EMEs and in banking crises

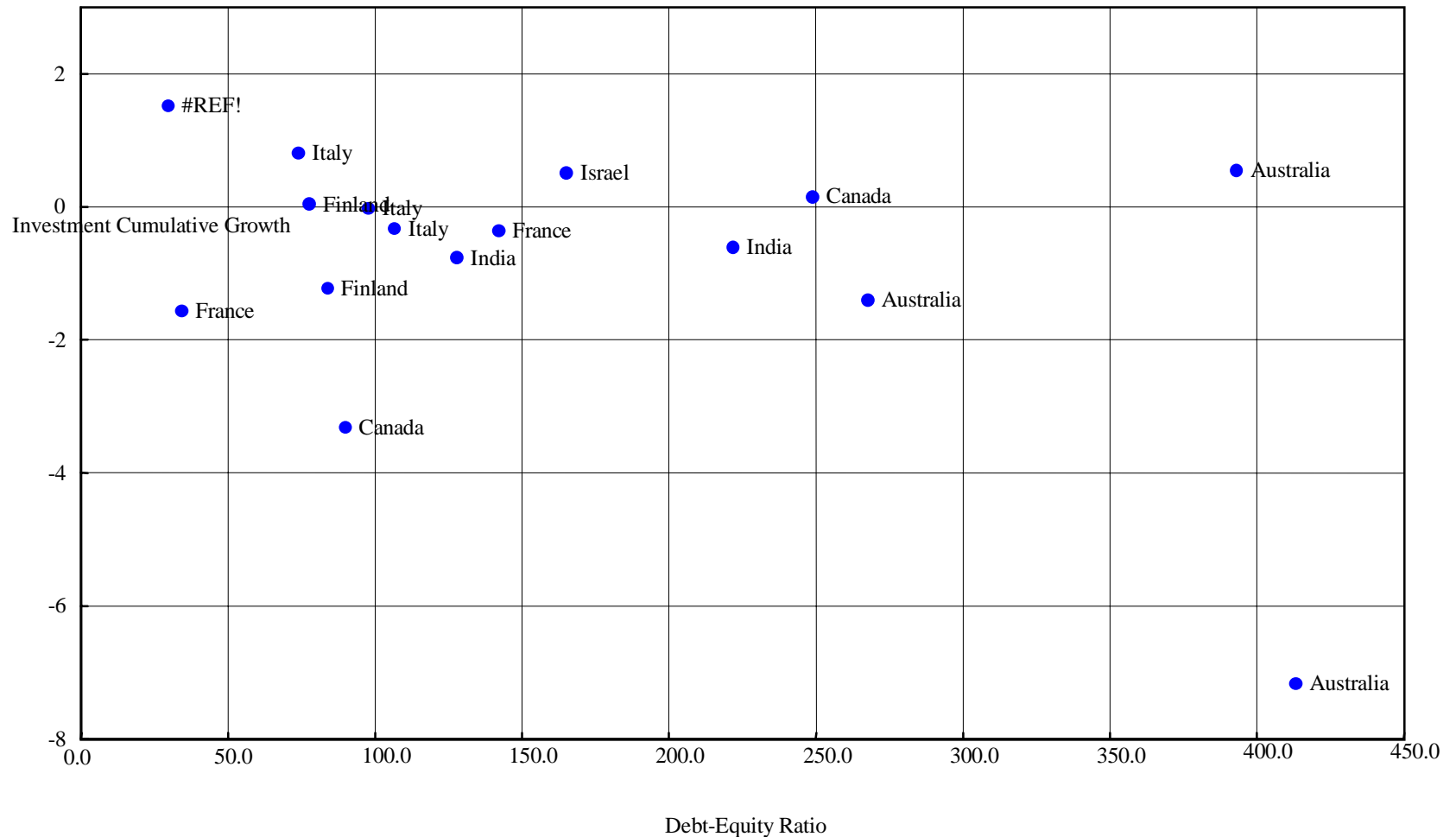
Private investment deviation from trend and leverage

Chart 1, Private Fixed Investment Deviation from Trend Growth and Debt-Equity Ratio, Crisis Years



Inventory accumulation and leverage

Chart 2, Private Fixed Inventory Deviation from Trend Growth and Debt-Equity Ratio, Crisis Years



Impact of crises on flow of funds/GDP

All crises (27)

	External finance	Bank loans	Bond issues	Equity issues	Trade credit	Liquidity
Average	-0.6	-0.5	0.1	-0.1	-0.1	-0.7
OECD	-0.1	0.0	0.1	-0.2	0.5	-0.1
EME	-1.4	-1.4	0.0	-0.1	-1.0	-1.6

Banking crises (9)

	External finance	Bank loans	Bond issues	Equity issues	Trade credit	Liquidity
Average	-2.0	-2.2	0.3	0.2	0.1	-1.7
OECD	-0.5	-0.6	0.3	-0.3	1.7	-0.1
EME	-3.4	-4.3	0.3	0.6	-1.5	-3.6

Currency crises (19)

	External finance	Bank loans	Bond issues	Equity issues	Trade credit	Liquidity
average	-0.7	-0.4	-0.1	-0.2	-0.4	-0.8
OECD	0.1	0.3	0.0	-0.1	0.1	0.0
EME	-1.8	-1.4	-0.1	-0.3	-1.2	-1.9

Econometric analysis

- Estimate specifications capturing normal cyclical developments before testing for additional effects of crises
- First estimated corporate expenditure functions with crisis and balance sheet variables
- Then estimated flow of funds/GDP determinants
- Cross section weighted GLS panel with fixed effects and cross section weights (common factors world growth, world trade, share prices, bond yields)

- Results suggest strong crisis effects on both corporate expenditure and corporate financing
- Crisis effects smaller for currency crises than banking crises and for OECD than EME
- Effects on investment aggravated by high debt/equity (financial accelerator) and low bank/debt (credit channel)
- Flow of funds equations suggest fall in bank lending, equity issue (information spillovers from bank lending) but rise in bond issue (multiple avenues of intermediation)

Jorgensen investment functions...

Dependent variable – log difference of private investment			
	All	EME	OECD
DLY	2.4 (0.112)**	3.2 (0.25)**	2.11 (0.13)**
DLY(-1)	-0.23 (0.14)*	0.26 (0.44)	-0.27 (0.16)*
DLIP(-1)	0.26 (0.04)**	0.16 (0.095)*	0.23 (0.05)**
LIY(-1)	-0.144 (0.014)**	-0.203 (0.03)**	-0.127 (0.015)**
DIRD	-0.0004 (8E-5)**	-0.00027 (7.6E-5)**	0.0006 (0.0008)
IRD(-1)	-0.0006 (0.0002)**	-0.0005 (8.3E-5)**	-0.0028 (0.0006)**
BDUM(-1)	-0.02 (0.009)**	-0.073 (0.035)**	-0.016 (0.0085)*
CDUM(-1)	-0.025 (0.006)**	-0.0074 (0.018)	-0.027 (0.0068)**
Adjusted R2	0.69	0.77	0.69
SE	0.06	0.08	0.05
Observations	517	105	412
Countries	23	6	17

...with balance sheet variables

	All	All	All
BDUM(-1)	-0.026 (0.013)**	-0.143 (0.102)	-0.178 (0.082)**
CDUM(-1)	-0.036 (0.01)**	-0.003 (0.02)	-0.026 (0.02)
LDER(-1)	-0.0092 (0.0032)**		-0.015 (0.004)**
BDUM*LDER(-1)	-0.02 (0.01)**		-0.0176 (0.01)*
CDUM*LDER(-1)	-0.034 (0.013)**		-0.038 (0.011)**
LBDEBT(-1)		0.115 (0.029)**	0.115 (0.03)**
BDUM*LBDEBT (-1)		-0.17 (0.04)	-0.214 (0.118)**
CDUM*LBDEBT (-1)		0.05 (0.04)	0.028 (0.031)

Tobin investment function

	All		
DLY	2.3 (0.11)**	2.3 (0.11)**	2.3 (0.11)**
DLY(-1)	-0.38 (0.16)**	-0.41 (0.15)**	-0.42 (0.15)**
DLIP (-1)	0.26 (0.049)**	0.29 (0.05)**	0.28 (0.05)**
LIY(-1)	-0.14 (0.02)**	-0.16 (0.023)**	-0.16 (0.023)**
LTOBIN(-1)	0.016 (0.0024)**	0.017 (0.003)**	0.019 (0.003)**
BDUM(-1)	-0.027 (0.014)*	-0.033 (0.015)**	-0.18 (0.09)**
CDUM(-1)	-0.028 (0.009)**	-0.033 (0.008)**	-0.022 (0.013)*
LBDEBT(-1)		0.056 (0.024)**	0.051 (0.024)**
BDUM*LBDEBT(-1)			-0.207 (0.12)*
CDUM*LBDEBT(-1)			0.015 (0.03)
Adjusted R2	0.77	0.74	0.74
SE	0.041	0.039	0.039
Observations	258	227	227
Countries	19	18	18

Inventory adjustment function

Dependent variable: change in inventories/GDP

	All	EME	OECD
DLY	0.06 (0.008)**	0.17 (0.04)**	0.049 (0.007)**
IY(-1)	0.46 (0.13)**	0.38 (0.28)	0.5 (0.108)**
DIRD	2.1E-5 (1.2E-5)**	1.9E-5 (1.1E-5)*	0.00011 (3.4E-5)**
IRD(-1)	2.4E-6 (1.3E-5)**	8.6E-6 (1.4E-5)	-1.2E-7 (2E-5)
BDUM	0.0002 (0.0007)	-0.02 (0.008)**	0.001 (0.0006)*
CDUM	-9.7E-6 (0.0003)	0.0006 (0.003)	-4.2E-5 (0.0003)
BDUM(-1)	0.0008 (0.0004)**	0.004 (0.009)	0.00036 (0.00036)
CDUM(-1)	-5.9E-6 (0.0003)	-0.0027 (0.003)	-5E-5 (0.0003)
Adjusted R2	0.49	0.49	0.53
SE	0.009	0.018	0.006
Observations	569	108	461
Countries	23	6	17

Bank lending function

Dependent variable: difference of bank lending/GDP

	All	EME	OECD
DLY	0.21 (0.028)**	0.13 (0.054)**	0.203 (0.032)**
DLY(-1)	0.078 (0.024)**	0.045 (0.032)	0.077 (0.04)*
BLY(-1)	-0.47 (0.046)**	-0.71 (0.117)**	-0.38 (0.052)**
DIRD	0.0014 (0.00016)**	0.0015 (9.8E-5)**	0.0017 (0.0004)**
IRD(-1)	0.0008 (0.0003)**	0.0013 (0.00027)**	0.00022 (0.00027)
BDUM	-0.0084 (0.0036)**	-0.019 (0.008)**	-0.0016 (0.0032)
CDUM	-0.0015 (0.0025)	-0.011 (0.0049)**	0.002 (0.0032)
BDUM(-1)	-0.0093 (0.0015)**	-0.013 (0.0028)**	-0.01 (0.0025)**
CDUM(-1)	-0.0039 (0.0011)**	-0.0046 (0.0028)*	-0.0057 (0.002)**
Adjusted R2	0.47	0.63	0.44
SE	0.025	0.032	0.019
Observations	362	120	242
Countries	23	6	17

Bond issuance function

Dependent variable: difference of bond issuance/GDP

	All	EME	OECD
DLY	0.007 (0.006)	-0.0004 (0.017)	0.02 (0.01)**
DLY(-1)	0.032 (0.011)**	0.03 (0.035)	0.044 (0.008)**
BOY(-1)	-0.48 (0.08)**	-0.34 (0.14)**	-0.55 (0.096)**
DIRD	-0.00014 (6.3E-5)**	0.00022 (0.00029)	-0.00029 (6.6E-5)**
IRD(-1)	8.4E-5 (3.8E-5)**	0.00021 (0.00016)	0.00012 (5.1E-5)
BDUM	0.0014 (0.0007)**	0.0009 (0.0015)	0.0023 (0.0009)**
CDUM	-0.0009 (0.0005)*	-0.0037 (0.002)*	-0.00023 (0.0006)
BDUM(-1)	0.001 (0.0015)	-0.0032 (0.0057)	0.0021 (0.001)**
CDUM(-1)	-0.0015 (0.0005)**	-0.0042 (0.004)	-0.0008 (0.0002)**
Adjusted R2	0.22	0.14	0.27
SE	0.009	0.011	0.008
Observations	346	104	242
Countries	22	5	17

Summary table of crisis dummies

Equation	All	EME	OECD
Tobin	-0.033 BDUM(-1)	n.a.	-0.036 BDUM(-1)
	-0.033 CDUM(-1)	n.a.	-0.036 CDUM (-1)
Jorgensen	-0.02 BDUM(-1)	-0.073 BDUM(-1)	-0.016 BDUM (-1)
	-0.025 CDUM(-1)		-0.027 CDUM (-1)
Inventories			0.001 BDUM
		-0.02 CDUM	
	0.0008 BDUM(-1)		
Bank lending	-0.0084 BDUM	-0.019 BDUM	
		-0.011 CDUM	
	-0.0093 BDUM(-1)	-0.013 BDUM(-1)	-0.01 BDUM(-1)
	-0.0039 CDUM(-1)	-0.0046 CDUM(-1)	-0.0057 CDUM(-1)
Bond issuance	0.0014 BDUM		0.0023 BDUM
	-0.0009 CDUM	-0.0037 CDUM	
			0.0021 BDUM(-1)
	-0.0015 CDUM(-1)		-0.0008 CDUM(-1)
Equity issuance			-0.0042 BDUM(-1)
			-0.001 CDUM(-1)
Trade credit	-0.00075 BDUM(-1)		
	-0.00048 CDUM(-1)		
External financing		-0.019 BDUM	
		-0.019 CDUM	
	-0.012 BDUM(-1)	-0.013 BDUM(-1)	-0.018 BDUM(-1)
	-0.004 CDUM (-1)		-0.008 CDUM(-1)
Liquidity			-0.0017 CDUM(-1)

Conclusion

- Probed impact of crises on corporate financing and expenditures in OECD and EME countries
- Marked differences in balance sheet size and composition as well as flows between OECD and EME countries
- Investment and inventory contractions key components of GDP decline in wake of crises, notably in EMEs, underlining importance of better understanding of dynamics of corporate behaviour during crises
- Role of debt equity ratio in determining impact as well as bank lending/debt
- Role of bond market as shock absorber in OECD

- Evidence strengthens the case for financial sector reforms, notably in EMEs, given role of external finance.
- Bank lending and trade credit warrant particular focus in EMEs
- Development of bond markets also warranted
- IMF surveillance needs to focus on corporate sector performance in macroprudential surveillance and not merely banking sector – and also in Article IV in assessing monetary policy transmission during a crisis
- Encourage countries to produce flows of funds including back data
- Further research in this overall area desirable