



India's Corporate Sector: Coping with the Global Financial Tsunami

NIPFP conference, Fall 2009

Hiroko Oura (IMF)

Petia Topalova (IMF)



Disclaimer

The views expressed in this presentation are those of the authors and do not necessarily represent those of the IMF or IMF policy.



Global Financial Crisis likely to spare India's corporate sector

- Indian financial markets have been battered as the global crisis deepens. (equity, exchange rate, CDS spreads)
- Indian corporate sector is now more integrated with the global economy through financial and real transactions....potential impact could be large.
- Corporate sector investment has been the key driver for the fast growth up to 2007... vulnerability in the corporate sector should have impact on real economy and banks

How bad could it be? What's the impact on investment and growth? Multiple tools for analysis.

- **Balance-sheet, accounting based analysis**
 - Historical/recent development of key ratios (leverage, interest coverage ratio (ICR))
 - Stress (sensitivity) tests
- **Expected default frequency (EDF)** (more forward looking, incorporating market data)
 - Fundamental-based (structural) approach (Black-Scholes-Merton, KMV) using balance sheet data and equity (only) market data
 - (↔ Market-based approach (based on CDS, bond spreads))
 - Historical/recent development of default probability/distance-to-default and their relation with macro/external factors
 - Stress (sensitivity) tests
- **Corporate vulnerability indicators and the real economy**

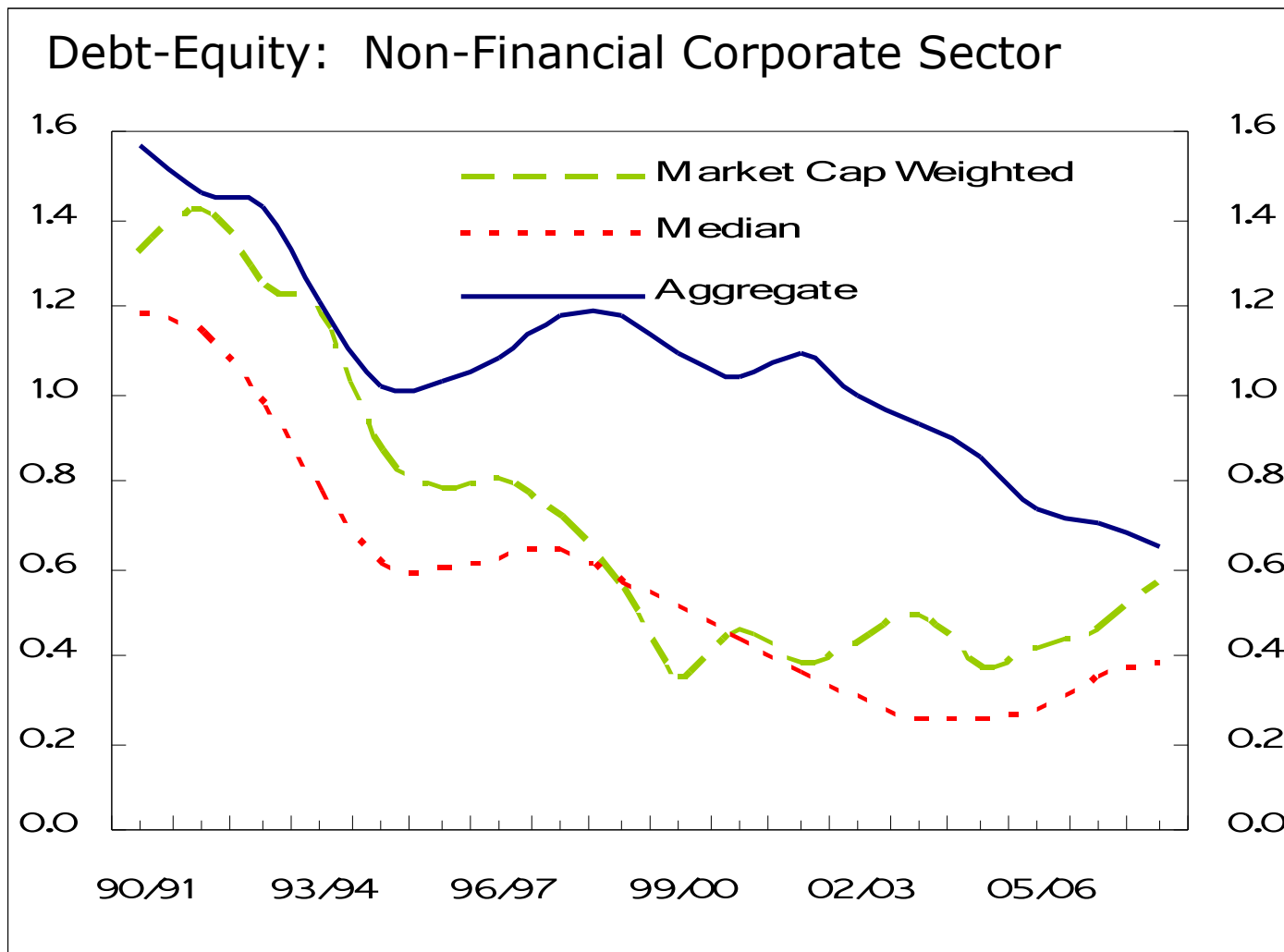
Data

- Prowess database, CMIE
- 1989/90-2007/08
- Balance sheet based analysis covers both listed and non-listed firms (about 2000 in early 90s and about 7000 in 2007/08)
- EDF approach focuses on listed firms with active equity price data (about 2300 in 2007/08) and starts in 94/95 as equity price data are relatively scanty before then.

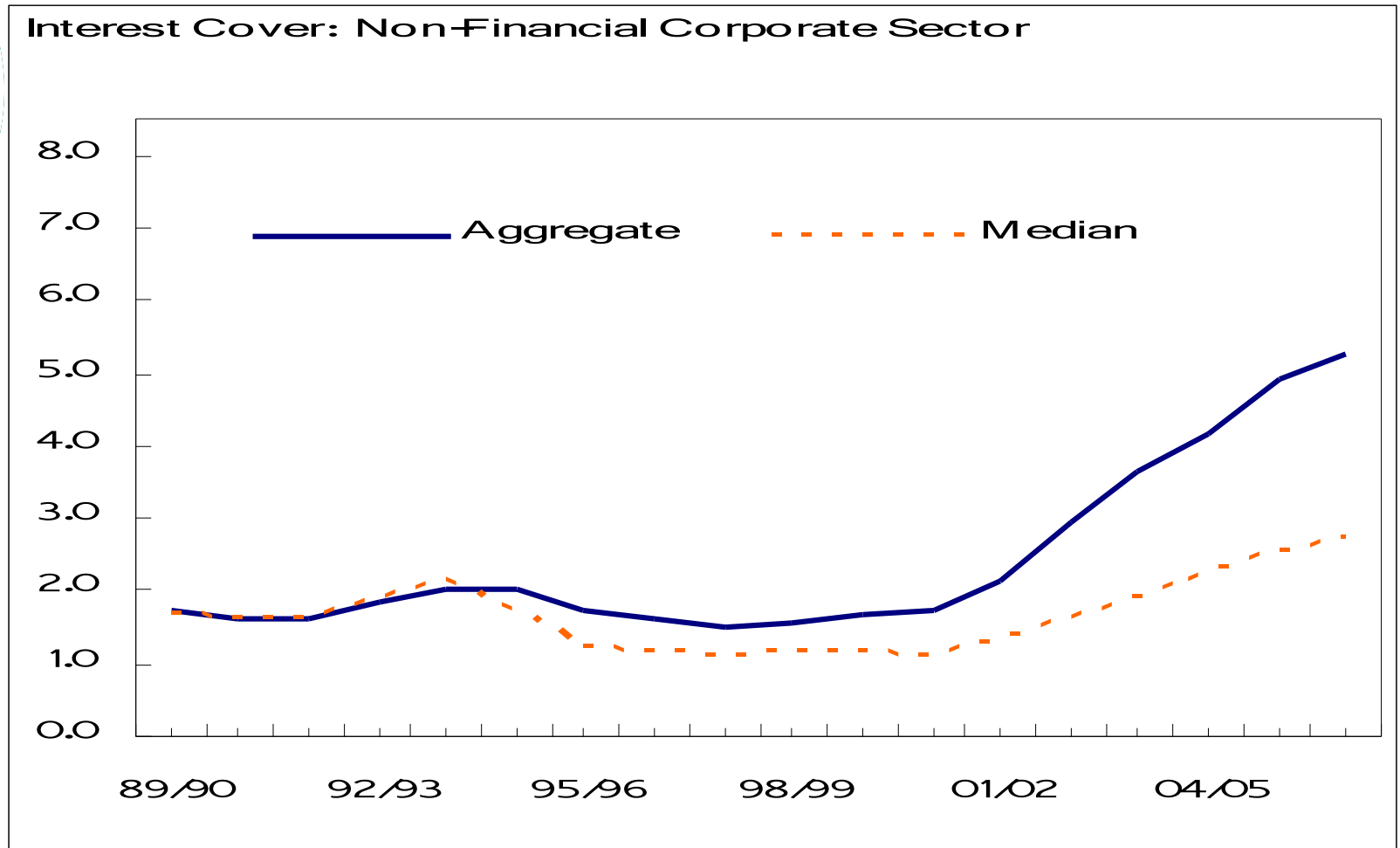


Balance-sheet based analysis

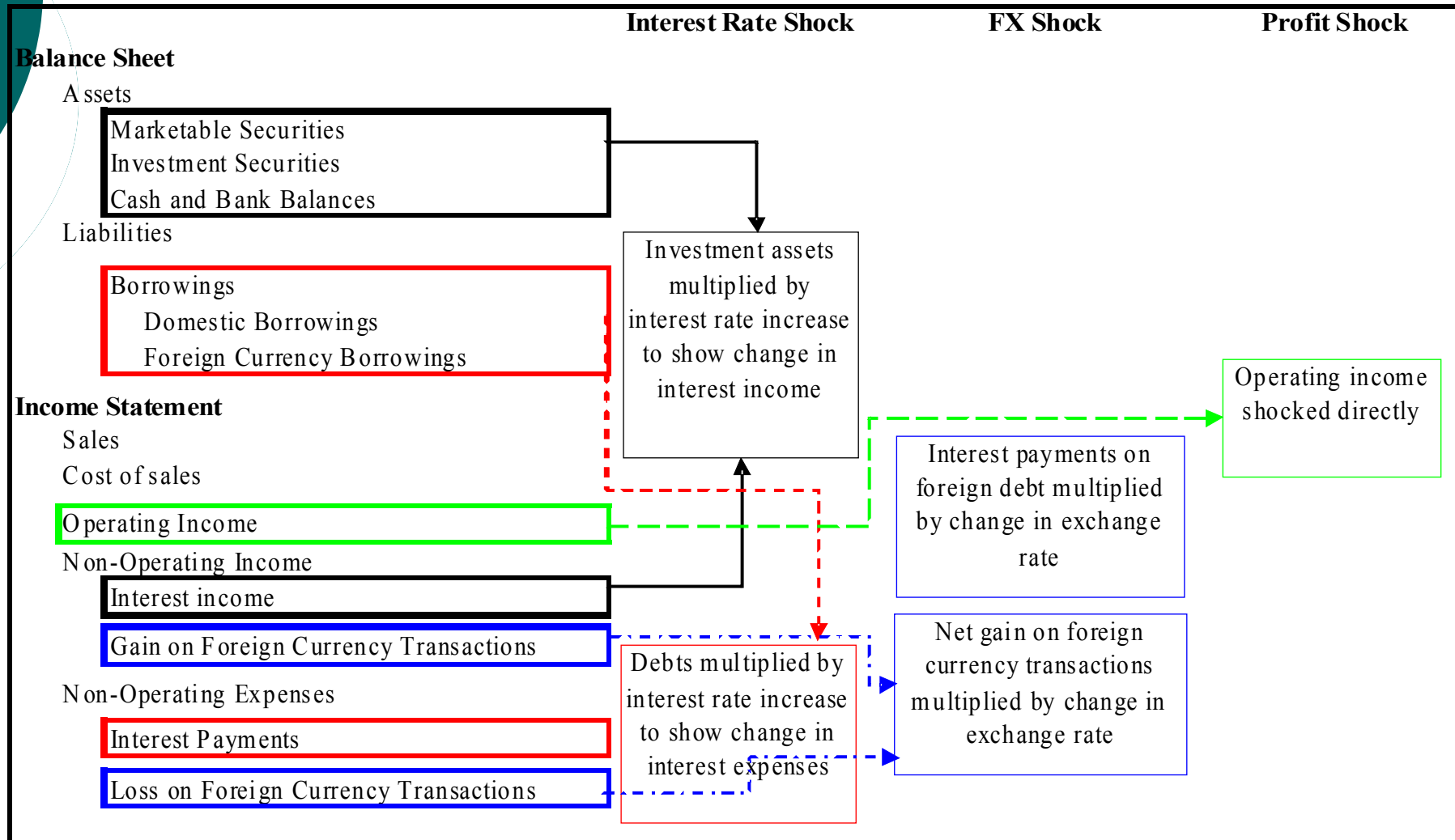
Big Indian non-financial firms have increased their leverage recently, but still comparable to EM Asia and America



High profit growth and declining interest rates provided extremely rich liquidity cushion among non-financial firms



Stress-test on ICR:

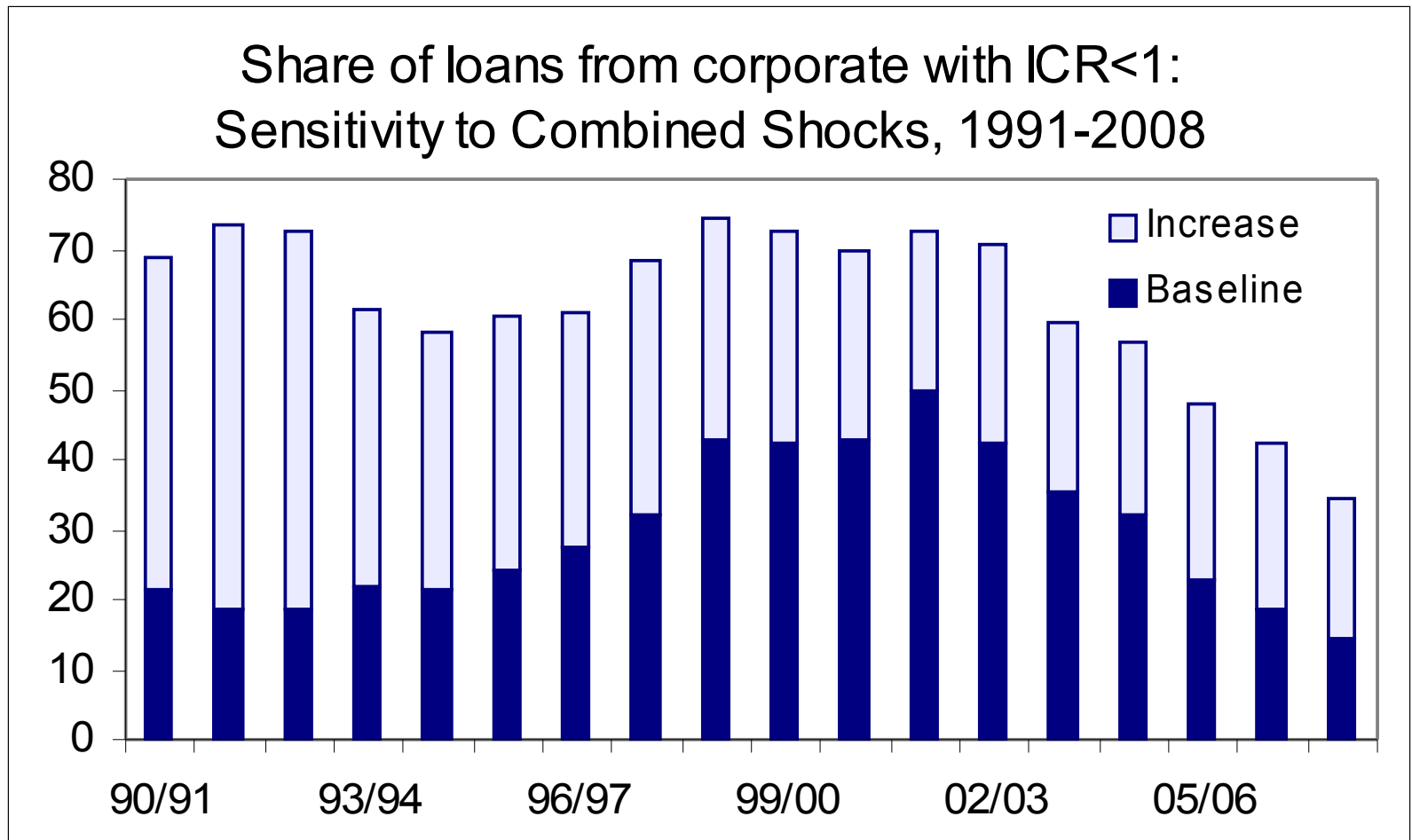


Domestic interest rate shock could increase “default” significantly, while FX shock seems less important

India: Stress-Test Results on the Non-Financial Corporate Sector

Baseline	March 08	Domestic Interest Rate Shock	Foreign Interest Rate Shock	FX Shock	Profits	Combined
		+ 500 bps	+ 700 bps	+ 25 percent	- 25 percent	
in percent		Changes from the baseline				
Share of borrowing of companies with ICR<1 in total corporate sector borrowing						
14.6		8.0	3.6	1.6	4.6	19.8
Share of the number of companies with ICR<1 in total number of companies						
22.1		12.6	1.0	0.1	5.9	21.3


However, the corporate sector balance sheet in recent years is more resilient against shocks compared to the 1990s





Summary: Balance sheet analysis

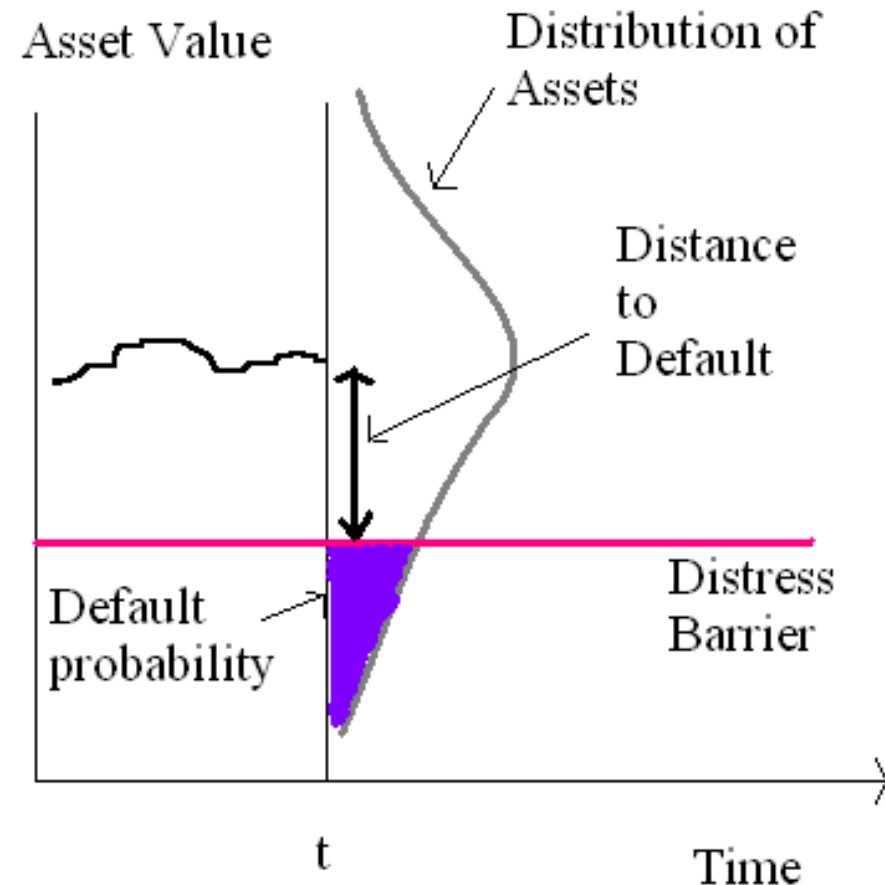
- Corporate balance sheets are healthier than in the 1990s and comparable to/ better than EM peers as of March 2008.
- However, a sharp deterioration in financial market conditions (as in fall 2008) could cause potentially large damage on the corporate sector's debt servicing ability, and hence its impact on banks' credit quality
- Domestic interest rates and to the lesser extent, foreign interest rates are the key source of corporate sector vulnerability. FX shocks are less important.



Expected Default Probability (EDP) approach

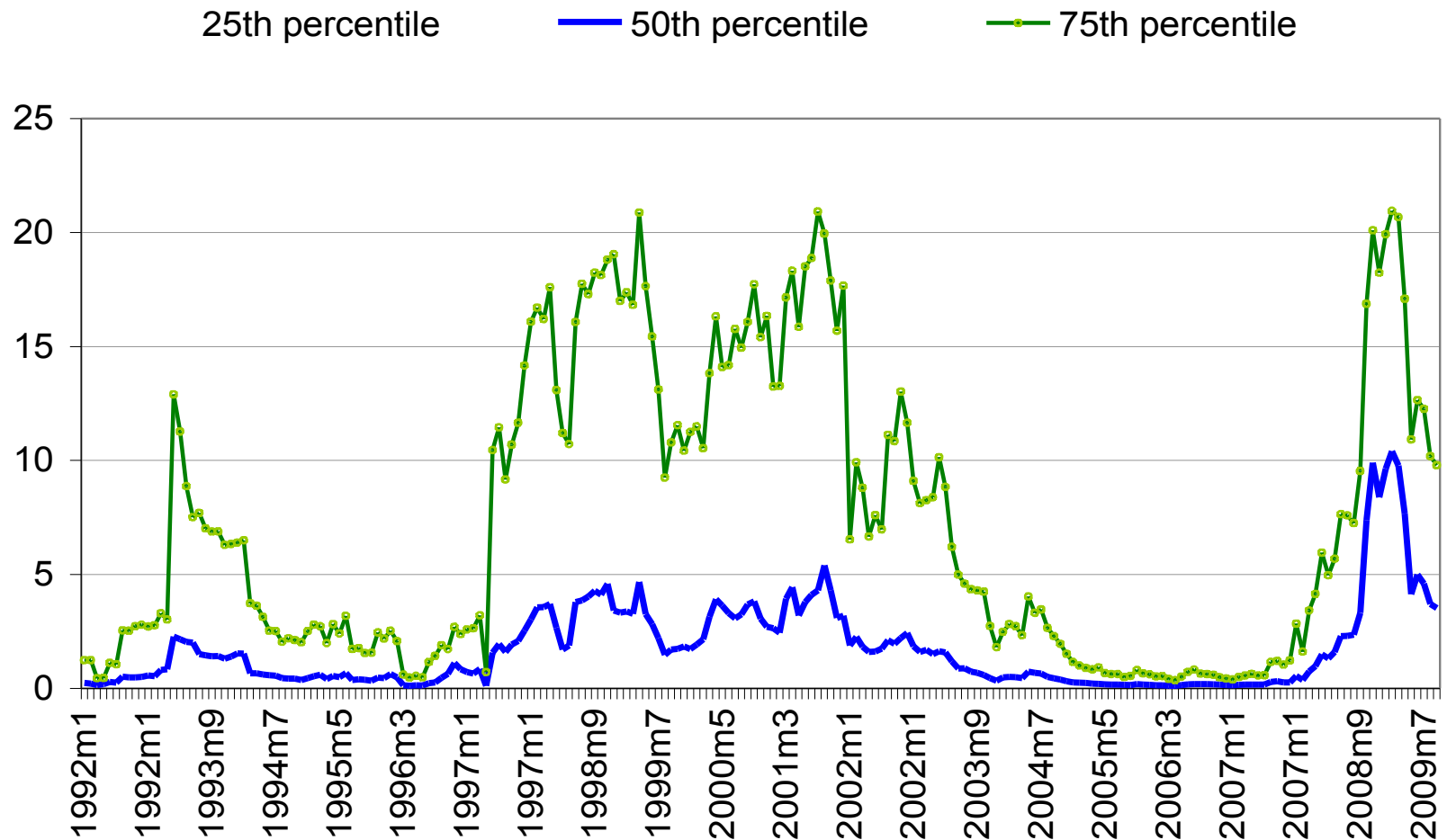
Framework: Distance-to-Default/Default probability depend on (1) how far away from distress barrier and (2) how risky your investment is.

Corporate Balance Sheet	
Asset	Liability
Market value of asset	Distress Barrier = ST debt + $1/2 * \text{LT debt} +$ interest payment
	Market value of equity



EDF(KMV) picked up sharply in fall 2008, despite strong balance sheet conditions as of March 2008

1 year EDFs for Non-financial firms in India (MKMV), in percent



Distance to default and EDF have strong predictive power for investment and growth at micro level

- **Micro-level ties** (t: time, i: firm, 94/95-07/08, non-financial firms)
- Reduced form investment model

Investment Ratio(t, i) (Capex/Asset)

$$\begin{aligned} &= \text{const.} \\ &+ \beta(1)\mathbf{DtD/EDF} (t-1, i) \\ &+ \beta(2)\text{Tobin's Q (M/B)} (t-1,i) \\ &+ \beta(3)\{\text{initial cash balance (t), sales growth (t),} \\ &\quad \text{size (t-1)}\} \\ &+ \text{Time dummies} \\ &+ \varepsilon(t, i) \end{aligned}$$

Results:

- DtD/EDF have statistically significant explanatory power (OLS, FE, Dynamic Panel)
- Including DtD/EDF tend to weaken the explanatory power of cash flow balance (usual proxy for financial frictions) but not sales growth (proxy for future growth, profitability) or MB

.... and at macro level

- **Macro-level ties** (t: time, 94/95-07/08)

$$\begin{aligned} \text{Investment/growth (t)} &= \text{const.} \\ &+ \beta(1) \text{ DtD/EDF (t-1, average)} \\ &+ \beta(2) \text{ investment/growth(t-1)} \\ &+ \varepsilon(t) \end{aligned}$$

Results:

- In particular, average DtD has stable and statistically significant predictive power.
- Robust to the inclusion of other macroeconomic/external variables
- Estimated coefficients are used later to see the implication of changes in DtD on investment/growth

Stress test: larger impact from equity valuation and volatility compared to rupee depreciation, partly reflecting large ongoing shocks in financial markets

Table Scenario: Distance to default, non-financial firms, (March 2008 baseline)

	Immediate default number	Shock size % of asset vol	Actual (a)	Post shock (b) Simple average DtD	Impact (b-a)
25% rupee depreciation since Mar. 08	4	-0.1%	5.6	5.6	0.0
Minimum equity price, Jan-Nov 08	0	-97.5%	5.6	5.3	-0.3
Historical high volatility	0	-1.4%	5.6	3.9	-1.7
Combined shock A (equity value and vol.)	0	-98.8%	5.6	3.6	-2.0
Combined shock B (equity val., vol., depreciation)	18	-98.6%	5.6	2.1	-3.5

Shocks in financial markets could severely dent India's investment and growth

	Coefficient vis-a-vis DtD	Impact of combined shock A (Δ DtD -2.0)	Impact of combined shock B (Δ DtD -3.5)
Corp.inv/GDP%	1.4**	-2.8 ppts	-4.9 ppts
Corp. inv growth rate % (contribution to GDP growth)	15.7*	-4.4 ppts	-7.7 ppts
Real GDP growth rate %	1.7***	-3.4 ppts	-6.0 ppts



Summary: Structural (BSM) approach

- Similarly to balance-sheet approach, March 2008 suggest good health in the corporate sector
- But corporate vulnerability indicators deteriorated sharply in fall 2008
- How much will actual defaults increase?... unknown (lack of historical default data)
- But the impact on investment and growth could be severe