Corporate Debt Overhang in Croatia: Micro Assessment and Macro Implications

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Motivation:
How large are corporate deleveraging needs ...

- Debt accumulation before the crisis became a burden in the crisis

- ˝*Debt is a two-edge sword*˝ (Cecchetti et al., 2011)

- When does debt go from good to bad?

  - Cecchetti et al. (2011) find the threshold of 90% of GDP above which the corporate debt becomes a burden to economic growth (based on aggregate data)

- ˝*There is no single threshold for debt ratios that can delineate the "bad" from the "good"*˝ (IMF, 2012)

- Firm level estimations of corporate debt overhang mostly based on comparative analysis and arbitrarily chosen thresholds

2

Motivation:
... and why does this matter?

□ Rich literature on macroeconomic implications of (over)indebtedness:

- *Lo and Rogoff (2015)* find a negative influence of debt overhang of all sectors on recovery after the recent great financial crisis

- *Eggertson and Krugman (2011),* who theoretically formalise the fact that over-indebted economic agents must decrease their debt, which adversely affects aggregate demand

- Country-level evidence: *Kalemli-Ozcan et al. (2015), Coricelli et al. (2010), Goretti and Souto (2013), Damijan (2014)*

 ➢ But they all use aggregate or arbitrarily selected thresholds for debt overhang

Motivation – case of Croatia

□ For Croatia, debt seems to be a „big issue":

■ European Commission Country Report on Croatia (2015):
  ″*Significant (...) deleveraging needs (...) weigh on the growth perspectives*″

■ IMF Country Report on Croatia (2015):
  ″*Debt overhang is a concern in particular for the corporate sector.*″

□ Yet, no empirical estimation for Croatia on how large debt overhang is, and what that means for economic activity

4

Croatia's corporate debt among the highest in CEE

Corporate sector debt in EU countries (as % of GDP)
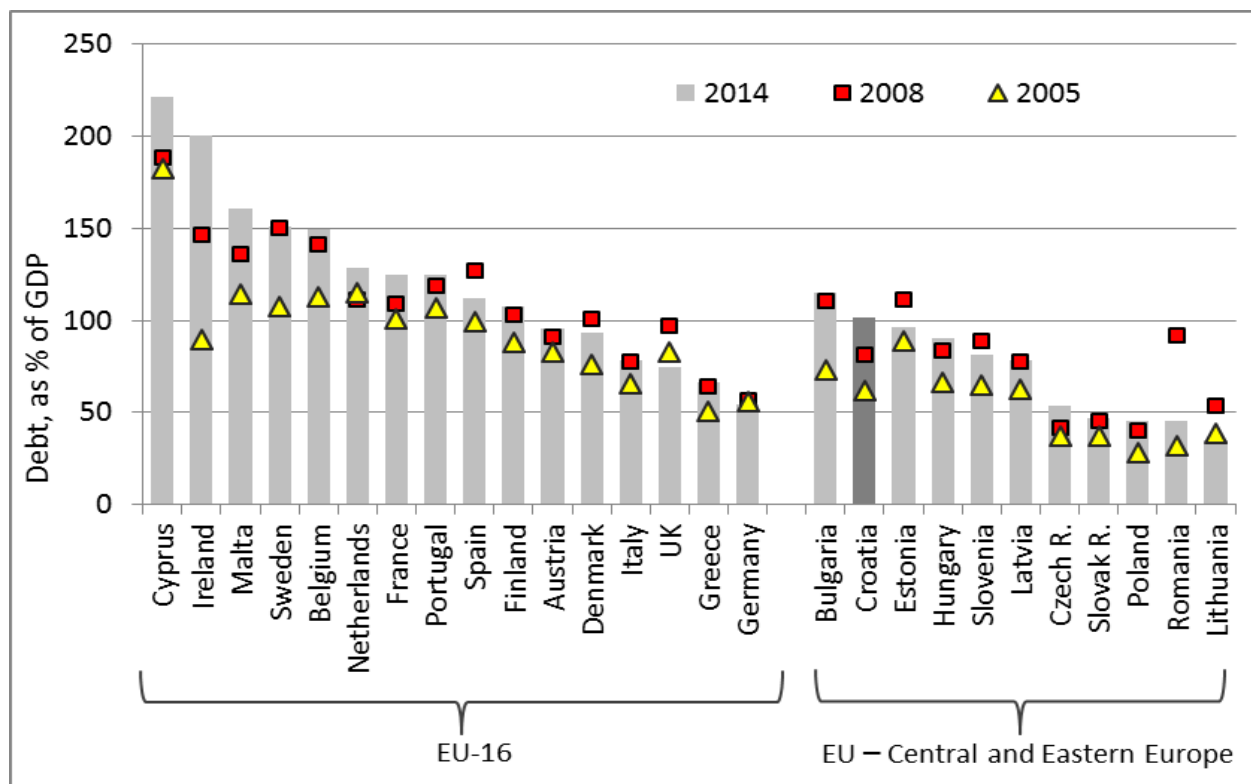
Note: Corporate debt is the sum of loans and debt securities from non-consolidated financial accounts.
Luxembourg (in which corporate debt stood at 346% of GDP in 2014) is not shown in the chart.
Source: Eurostat

Corporate debt sustainability analysis (1)

- No uniform approach in the literature

- We use methodology developed by IMF (GFSR, April, 2013)

- Analysis based on the concept of **net free cash flow**:

$$NFCF = \frac{Net\ free\ cash\ flow}{Assets} =$$

$$= \frac{Operating\ cash\ flow\ before\ interest}{Assets} - \frac{Interest\ expense}{Debt} \times \frac{Debt}{Assets} - \frac{Capital\ expenditures}{Assets} - \frac{Dividends}{Assets}$$

- First, we detect firms with high debt (>30% of assets)

- For them, if *NFCF* < 0, debt is unsustainable

  - Sustainable debt equals debt at which *NFCF* = 0

  - Debt overhang = actual debt − sustainable debt

Corporate debt sustainability analysis (2)

- **Forward-looking approach** – projecting medium-term debt sustainability up until 2017)

  - Operating profits and interest expenses projected until 2017, other elements kept unchanged at last recorded levels (for 2014)

- **Firm-level data**

  - Amadeus database

  - Sample: 31,656 firms (about 62% of total corporate sector assets and 59% of total corporate debt in 2014)

7

Corporate debt sustainability – results

- One third (31,2%) of corporate debt appears excessive

- Uneven distribution of debt overhang across the sector

  - Top 100 firms hold ¾ of total debt overhang

  - Largest deleveraging needs in construction, electricity supply, other services (mostly due to professional and technical activities related to construction)

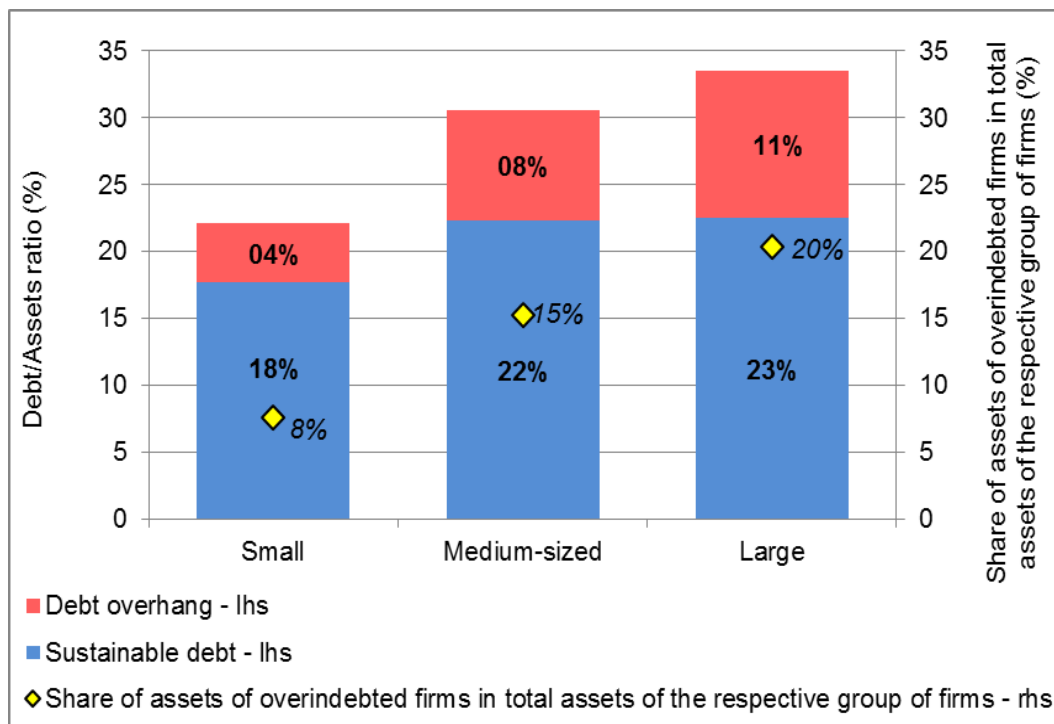*Corporate debt sustainability by activities*
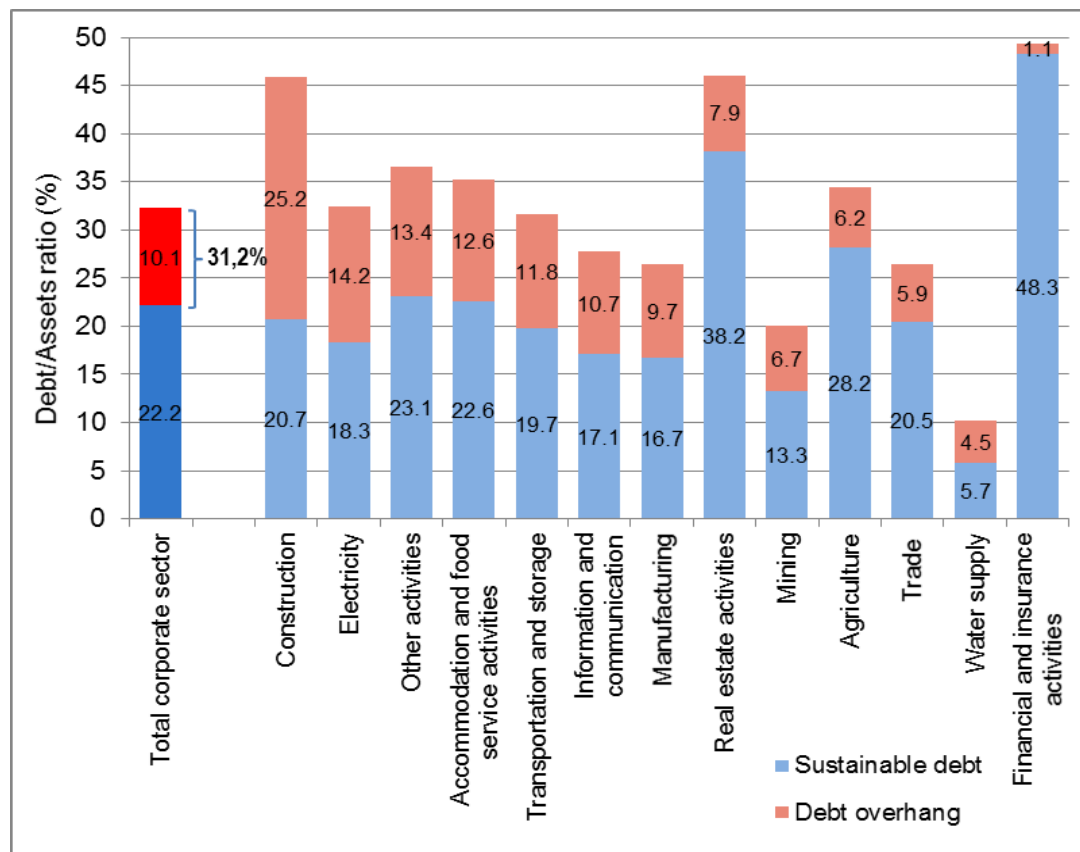
Note: Activities are ordered by the share of debt overhang in assets. Debt overhang is the difference between actual debt and sustainable debt.
Sources: Amadeus, FINA.

8

Small firms less indebted and with lower deleveraging needs

*Corporate debt sustainability by firm size*

Note: The categorisation of enterprises by size was obtained from the Amadeus database. Large enterprises meet at least one of the following criteria: (a) operating income ≥ EUR 10 mil, (b) total assets ≥ EUR 20 mil, (c) number of employees ≥ 150. Medium-sized enterprises are those that meet at least one of the following criteria: (a) operating income ≥ EUR 1 mil, (b) total assets ≥ EUR 2 mil, (c) number of employees ≥ 15, and are not large.
Sources: Amadeus; FINA

9

Foreign-owned firms more burdened with debt overhang

Corporate debt sustainability by ownership
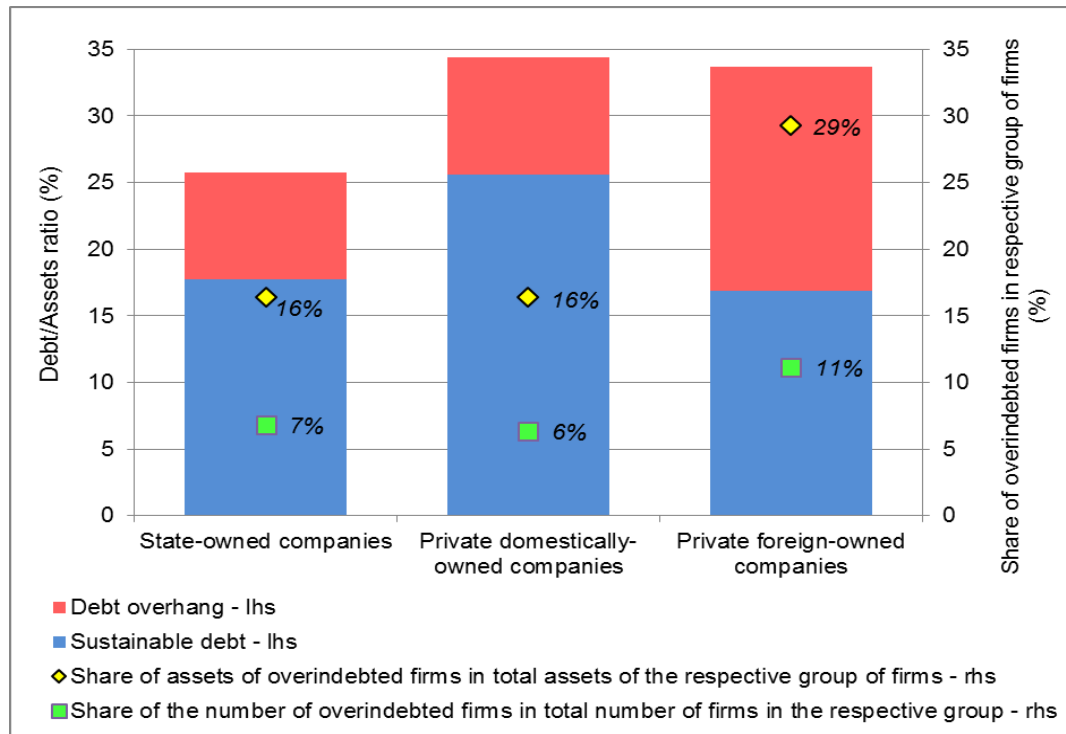
Note: The categorisation of enterprises by ownership was obtained from FINA's database. Mixed ownership with the share of government capital above 50% is classified as government ownership, and that with the share of government capital below 50% as private ownership. Private foreign-owned enterprises are those in which foreign private capital exceeds 50% of capital.
Sources: Amadeus; FINA

10

Exporters less indebted and less burdened with deleveraging needs than non-exporters

*Corporate debt sustainability by participation in exports*
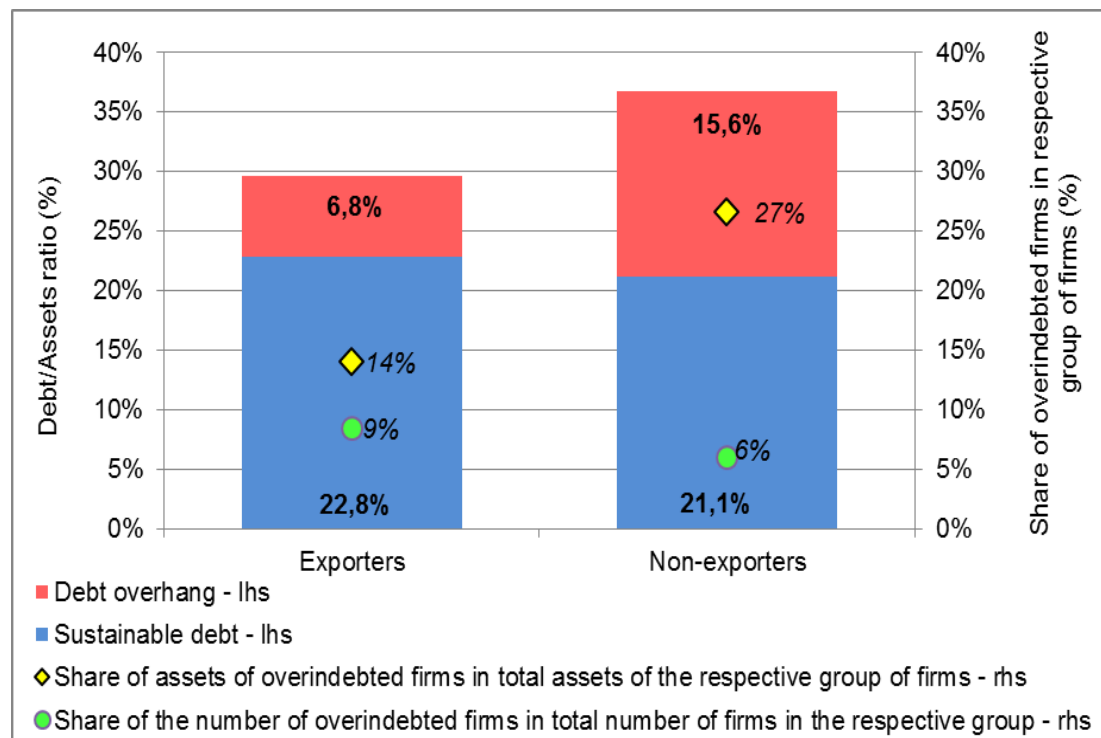
Note: Data on exports by enterprises have been obtained from the FINA database for 2014.
Sources: Amadeus; FINA

Sensitivity analysis

- Testing sensitivity of debt sustainability to different macroeconomic shocks

  - interest rate increase

  - GDP fall

- Stronger effect comes from GDP shock than from IR shock

- Downside scenario with both shocks → **almost a half of total corporate debt would become excessive**!!!

Estimated debt overhang under different scenarios
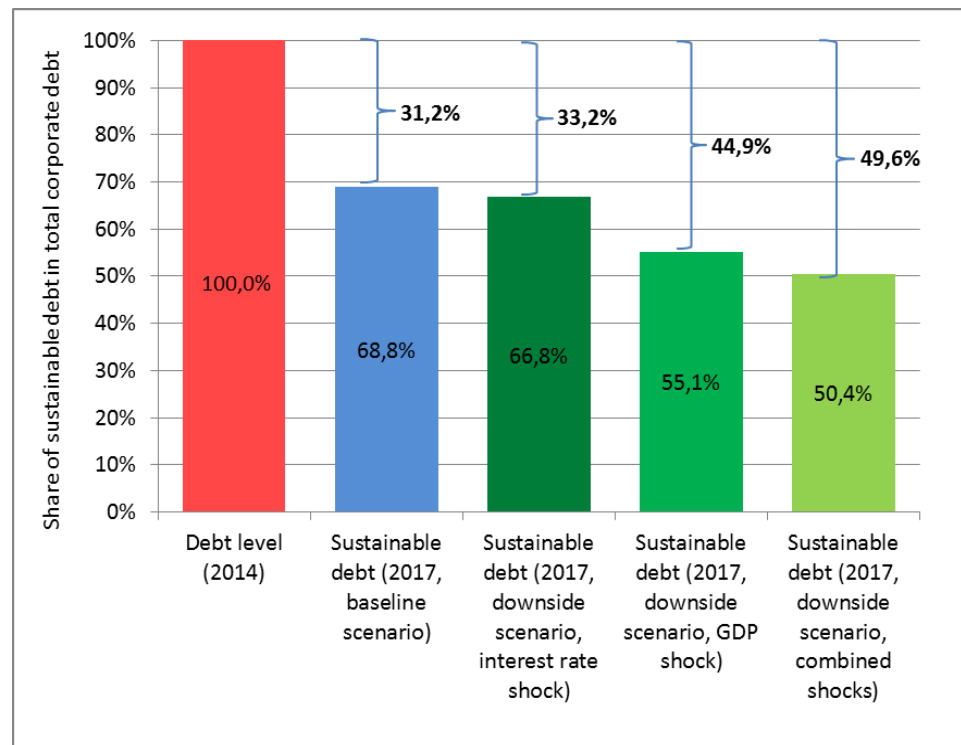
Note: The data next to the brackets show the needs for deleveraging, expressed as % of the total debt of sample enterprises.
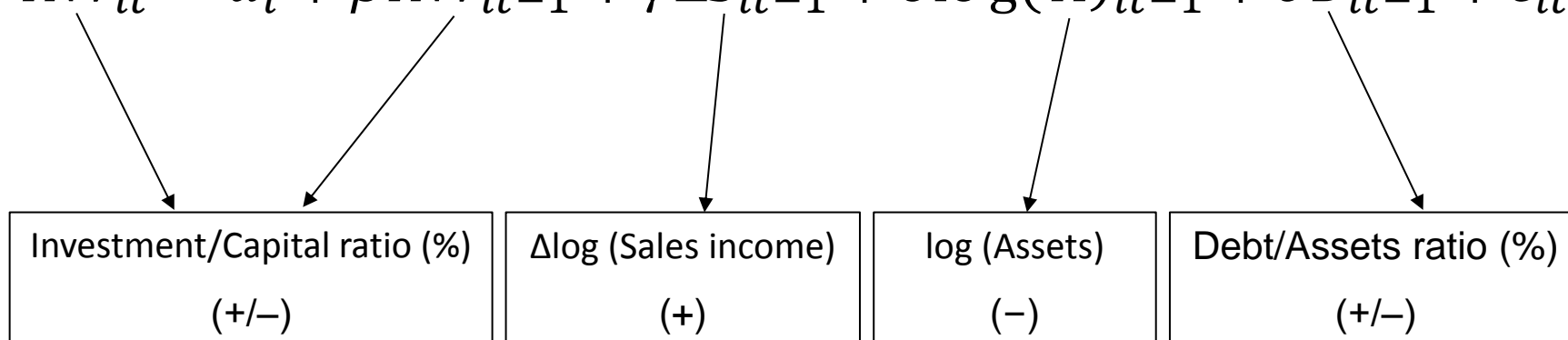Sources: Amadeus; FINA

12

Macro implications of debt overhang (1)

- ❑ Is debt good or bad for investment?

- ❑ What does theory say?
  - ◼ Modigliani/Miller vs. trade-off and pecking order theories

$$INV_{it} = \alpha_i + \beta INV_{it-1} + \gamma \Delta S_{it-1} + \delta \log(A)_{it-1} + \sigma D_{it-1} + \varepsilon_{it}$$

Investment/Capital ratio (%) (+/−)	Δlog (Sales income) (+)	log (Assets) (−)	Debt/Assets ratio (%) (+/−)

Macro implications of debt overhang (2) - Asymmetric effects

- Is the relationship between debt and investment asymmetrical?
  - Let's introduce (firm-specific) dummies!

$$INV_{it} = \alpha_i + \beta INV_{it-1} + \gamma \Delta S_{it-1} + \delta lo\, g(A)_{it-1} +$$

$$+ \overline{\sigma} D_{it-1} \times 1\{D_{it-1} > \tau_{it-1}\} + \underline{\sigma} D_{it-1} \times 1\{D_{it-1} \leq \tau_{it-1}\} + \varepsilon_{it}$$

Debt overhang indicator
(equals 1 when a firm has *excessive* debt)

No debt overhang indicator
(equals 1 when a firm has *sustainable* debt)

Estimation results

Explanatory variables	Baseline model	Model including asymmetric effects of debt
INV_{t-1}	-0.00	-0.00
S_{t-1}	0.18**	0.17**
$\log(A_{t-1})$	-1.67***	-1.63***
D_{t-1}	-1.91***	
D_{t-1}*OVERHANG INDICATOR$_{t-1}$		-2.37***
D_{t-1}*NO OVERHANG INDICATOR$_{t-1}$		-1.08***
Hansen test (probability)	0.14	0.11
1st order autocorrelation (probability)	0.07	0.08
2nd order autocorrelation (probability)	0.49	0.51

Notes: * significant at 1%, ** significant at 5%, *** significant at 10%.
Estimation method: GMM (first difference estimator)
Instruments: dependent variables with two and three time lags.
The models include fixed effects for enterprises and dummy variables for time periods.
Source: Authors' calculation.

15

Findings and policy implications

□ Corporate sector deleveraging still has a long way to go

□ High and unsustainable indebtedness hinders investment

□ Proactive and coordinated policy efforts needed to facilitate orderly deleveraging

□ Changes in regulatory and institutional framework for:

  ■ stimulating debt restructuring for promising enterprises

  ■ simplifying insolvency and bankruptcy procedures

  ■ improving investment and business climate