



The Effects of a Regulatory Intervention in Debt Contracts—Evidence from Corporate Bonds in Israel

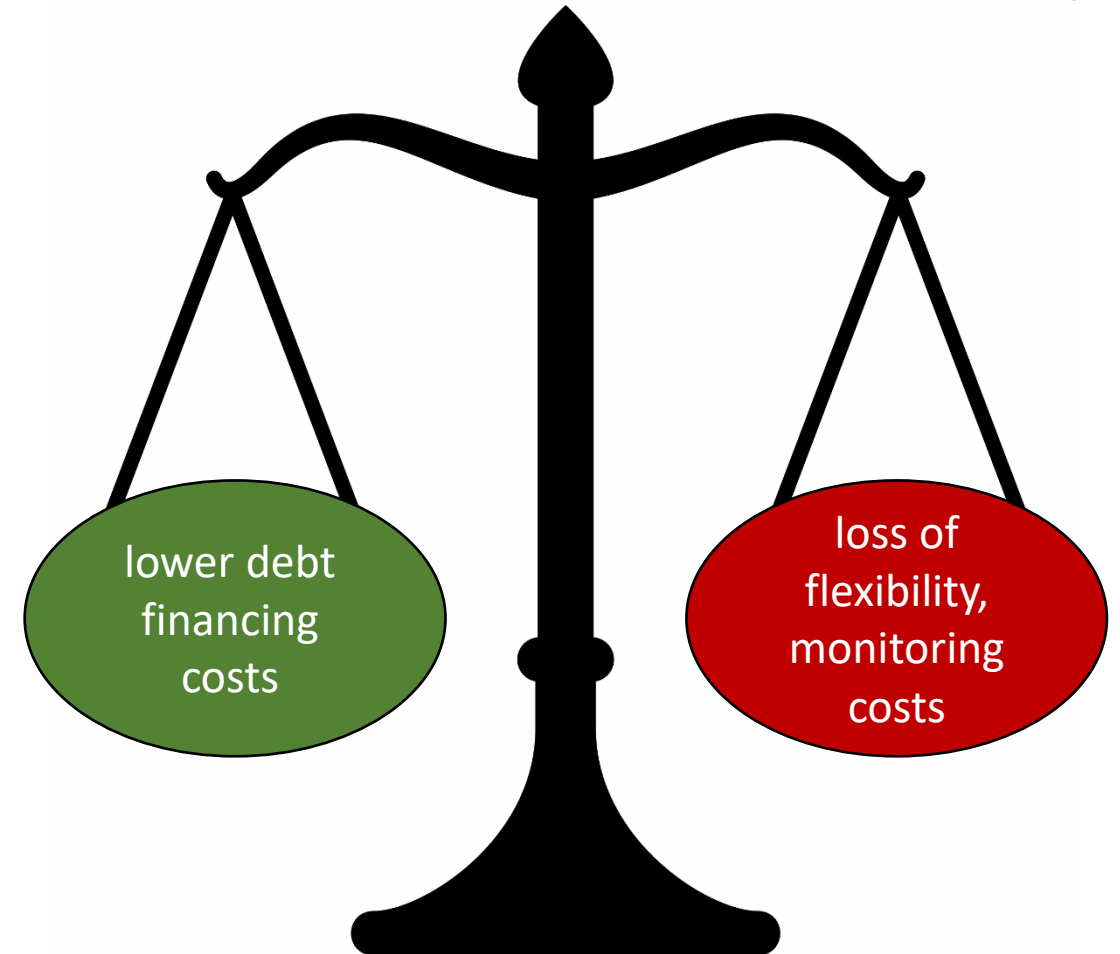
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Why are there covenants in debt contracts?

- Covenants aim at minimizing agency costs (Coase, 1937; Jensen and Meckling, 1976).
- Covenants address the incompleteness of contractual arrangements (Aghion and Bolton, 1992; Hart and Moore, 1988).



Empirical evidence regarding the use of covenants in public bonds

- An observed distinction between covenants in private loans and public debt in terms of the types of covenants included, their tightness, and their renegotiation flexibility.
 - Private debt contains far more covenants than public debt.
 - Covenant violations occur almost exclusively in private debt.
 - Public debt includes mostly restrictive covenants and few performance-based covenants.
 - Some view covenants in public bond contracts as standard boilerplates that serve little purpose.
- Several empirical studies have found that the incorporation of restrictive covenants in public debt follows the predictions of the agency theory and that covenants carry economic value [Malitz (1986), Nash et al. (2003), (Kahan and Tuckman, 1993), Reisel (2014)].

Origins of the regulation in Israel applicable to institutional investors



- Multiple debt reorganizations involving public corporate bonds in Israel after the GFC.
- Reorganizations proved disadvantageous to bond creditors (Ana Sasi-Brodesky, 2024).
- As a group, institutional investors hold significant ratios of corporate bond debt.
- "Committee to Determine Parameters for Consideration by Institutional Investors that Provide Credit through the Purchase of Non-Government Bonds" (known as the "Hodak" committee after the name of its Chairman) was established in 2009.
- Following committee recommendations, CMISD instructed institutional investors to formulate an investment policy in corporate bonds. The regulation went into effect in October 2010.
- Israel's Security Authority (ISA) did not impose similar regulation on mutual funds.

Research question and hypothesis

- *Research question:* Was this regulation successful in improving corporate governance exerted by creditors in the bond market?
- *Hypothesis:* I expect that institutional investors would attempt to employ covenants that do not require intense monitoring. As a consequence, I expect to find that covenants carry no or a very small positive effect on debt financing costs.
- *Rational:* Diffused ownership structure on the creditors' side creates free riding problems in monitoring and increases the costs of contract renegotiation.

Methodology

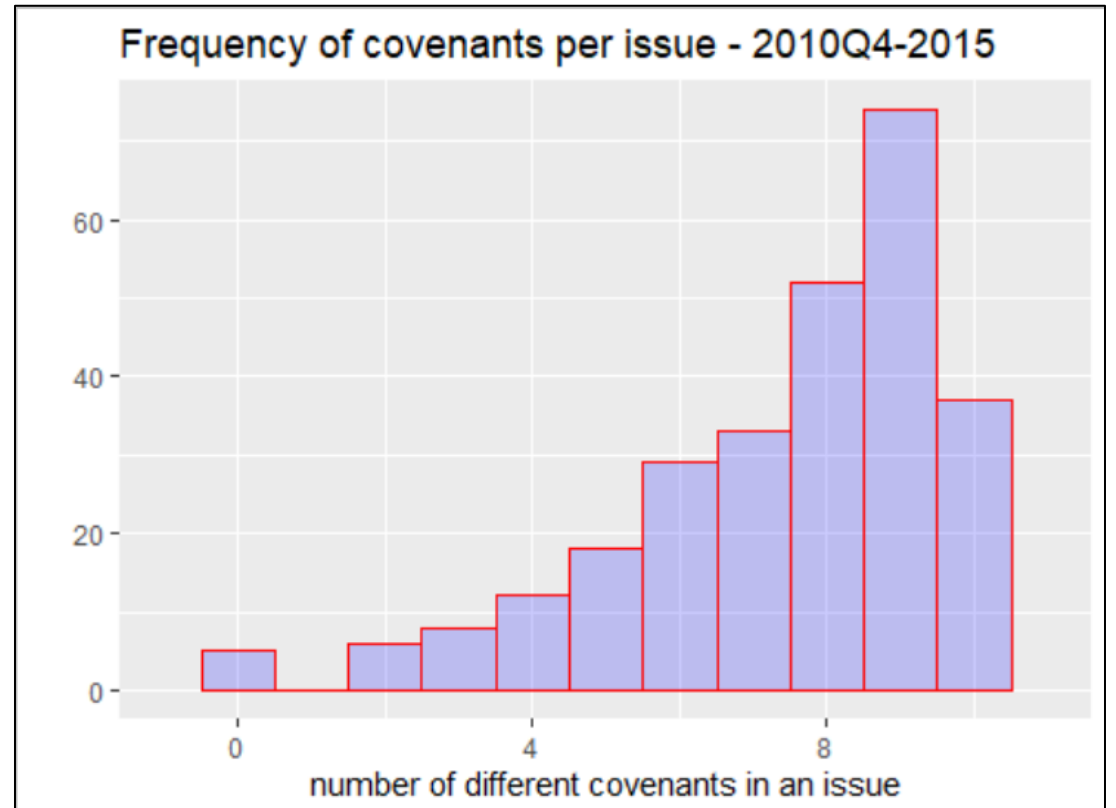
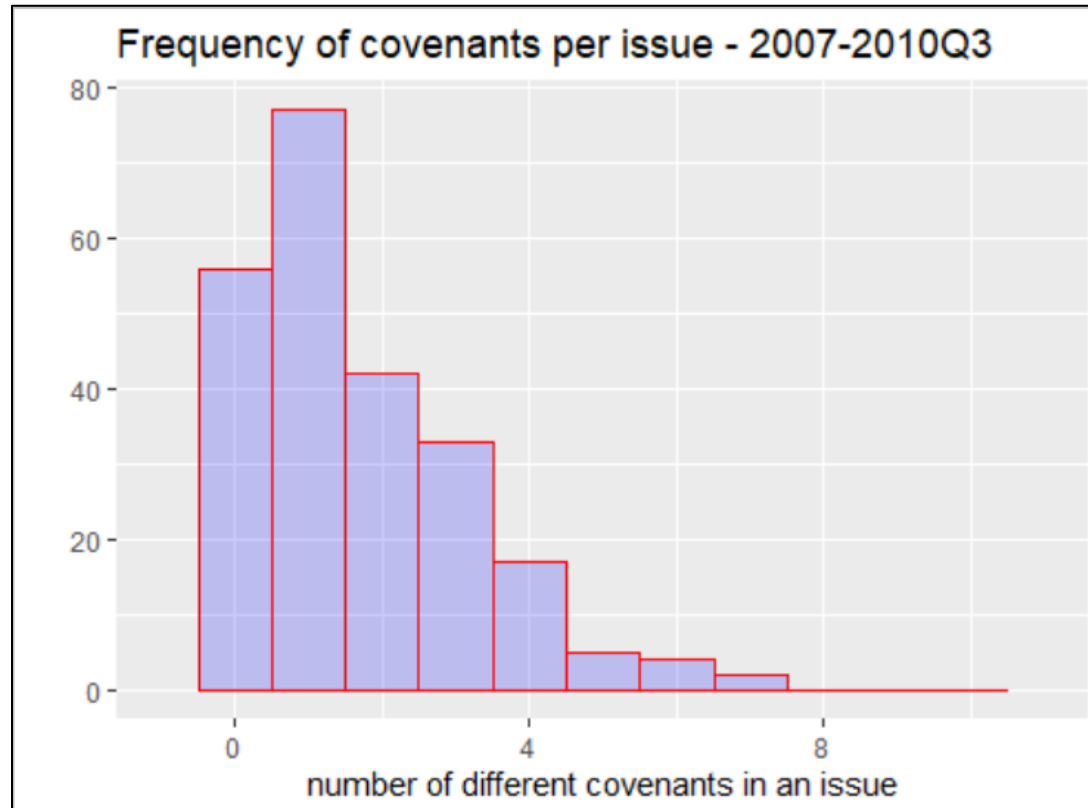
- International comparison.
- Initial tightness of covenants.
- Violation frequency.
- Price impact of covenants' inclusion.

Data



- Local corporate non-bank and non-insurance bond issues in the period 2007 to 2015.
- Each bond indenture was classified into one or more of ten covenant categories:
 - Six restrictive types (dividend, negative pledge, merger, transfer of ownership etc.)
 - **Four performance based types - either based directly on accounting measures or tied to the bond's rating.**
- Quarterly filings of financial statement.
- Daily trading information from the TASE.
- Macroeconomic variables.

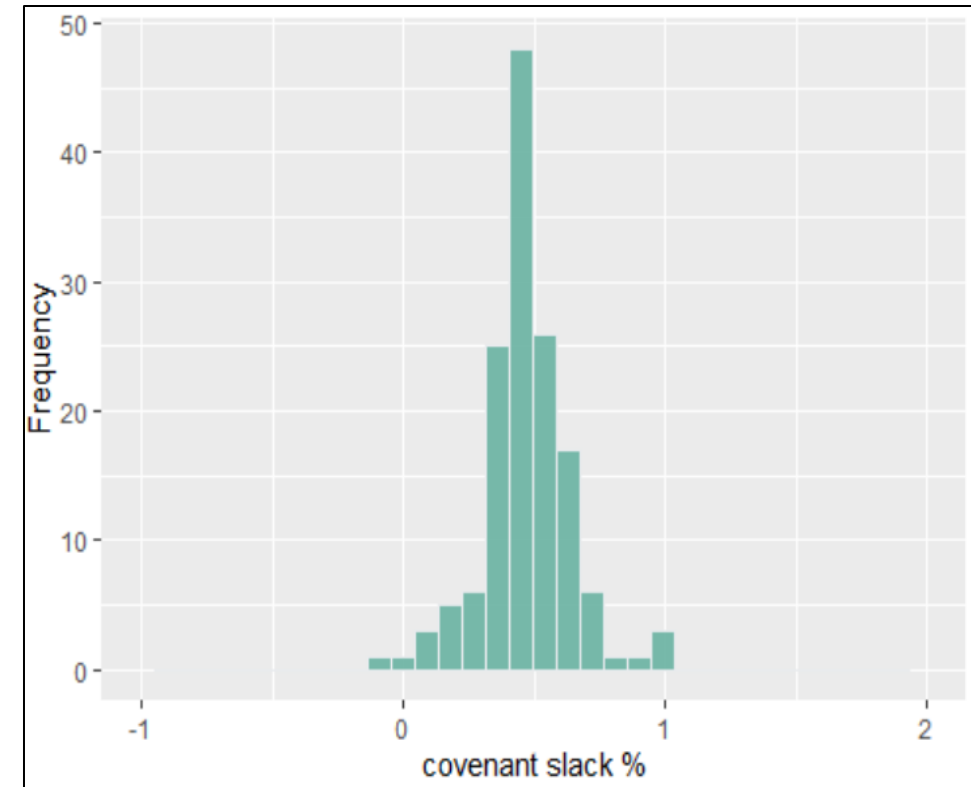
The effect of the regulation



Results (2) : Initial tightness of covenants

Covenant	Obs.	Covenant slack	Covenant slack
		in %	in SD
		Mean[median]	Mean[median]
Min. Net worth	144	45%[46%]	2.1[1.9]
Min. Adj. Net worth	47	42%[41%]	2.5[2.2]
Min. Net worth-to-assets	77	20%[25%]	1.2[1.0]
Min. Adj. Net worth-to-assets	36	-13%[31%]	1.4[1.8]
Max. net fin. Debt-to-CAP	35	59%[29%]	1.5[0.7]
Max. net fin. Debt-to-EBITDA	15	101%[55%]	1[0.4]

Distribution of the Initial Distance to Violation for Net Worth Covenants in Percent



Estimating price impact (1) – two stage specification

- The first stage of the analysis includes estimating a reduced form Probit model of the covenant selection equation:

$$(1) \quad CVN = \alpha_0 + \alpha_1 X' + \alpha_2 C + \varepsilon'$$

- CVN - a dummy equal 1 if a performance –based covenant was used.
- C are costs associated with the use of the covenant.
- X' captures benefits associated with the covenant.

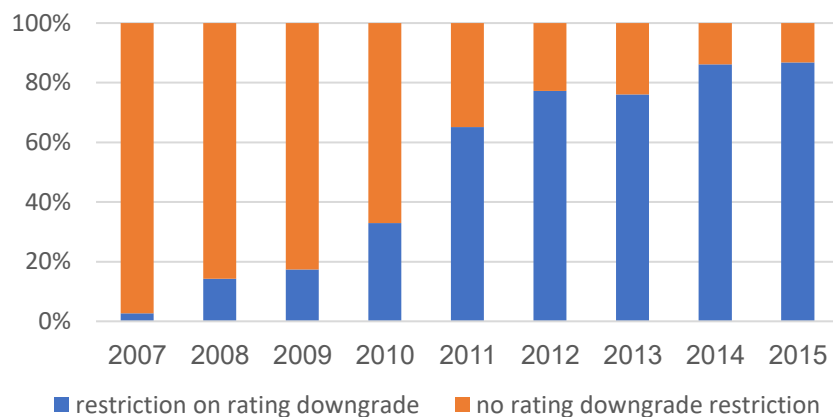
Estimating price impact (2)

- From this first-stage estimation, I obtain the inverse Mills' ratios for bonds with and without covenants [$(\phi(\hat{\psi})/(1 - \Phi(\hat{\psi})))$ when covenants are not included and $-\phi(\hat{\psi})/\Phi(\hat{\psi})$ when covenants are included].
- If selection bias is present in the data, the selectivity variable, IMR , will be significant.
- Second stage pricing equation
$$(2) \quad Y = \beta_0 + IMR + \beta_1 X + CVN + \varepsilon$$
- IMR - inverse Mill's ratio.
- Y - average bond spread measured during the first 30 days.
- X - are determinants of the bond spread.

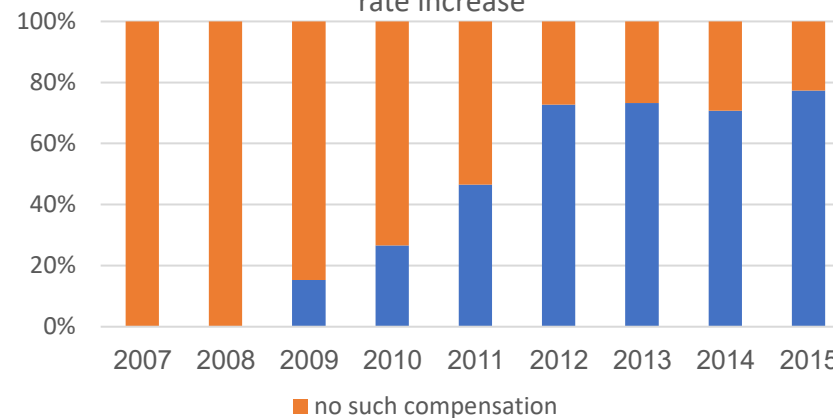
Frequency of performance based covenants in the data



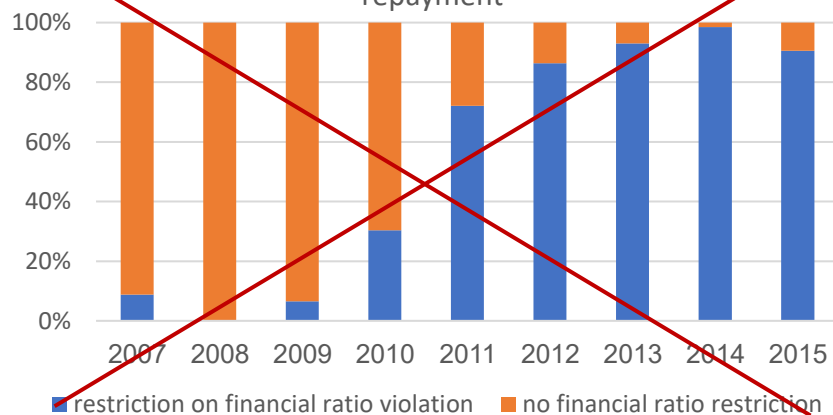
Use of rating-based covenant that invokes repayment



Use of rating-based covenant that invokes interest rate increase



Use of financial ratio-based covenant that invokes repayment



Use of financial ratio-based covenant that invokes interest rate increase



Summary Statistics of Issues and Issuers



	Rating restrictive (with /without)		Rating interest compensation (with/without)		Accounting ratios interest compensation (with/without)	
N	160	57	145	72	91	126
Issue value (NIS million)	212.3	110.1 ^{***}	203.7	146.9 ^{**}	125	229.2 ^{***}
Market value of equity (NIS million)	2,089.4	529.6 ^{***}	1612.4	1815.2	598.660	2,460.4 ^{***}
Equity daily return standard deviation (%)	2.1	2.5	2.1	2.4	2.0	2.4
Equity daily return mean (%)	0.1	0.1	0.1	0.1	0.1	0.1
Assets (million NIS)	7,294.3	3,473.6 ^{**}	7,244.8	4,369.3	2,801.5	8,810.6 ^{***}
Leverage	0.5	0.4	0.5	0.4	0.4	0.5 [*]
Tangibility	0.1	0.1	0.1	0.1	0.1	0.1
Interest coverage ratio	5.3	3.7	4.7	5.1	3.8	5.6
Cash flow volatility (%)	1.1	1.5 [*]	1.1	1.4 [*]	1.2	1.2
Market-to-book	1.1	1.1	1.0	1.1 [*]	1.0	1.1 ^{**}
Duration (Years)	5.4	4.1 ^{***}	5.4	4.4 ^{***}	4.6	5.4 ^{***}
Spread (%)	3.4	5.3 ^{***}	3.4	4.9 ^{***}	4.2	3.7 ^{**}
Annual coupon rate (%)	4.7	6.2 ^{***}	4.7	5.9 ^{***}	5.4	4.9 ^{**}
Investment grade (dummy)	1.0	0.1 ^{***}	1.0	0.3 ^{***}	0.7	0.8 [*]
Secured (dummy)	0.2	0.7 ^{***}	0.2	0.6 ^{***}	0.4	0.3
Years to maturity	8.9	6.0 ^{***}	8.9	6.6 ^{***}	7.3	8.7 ^{***}

Second stage regression results (OLS)



	Rating-based invoking repayment	Rating-based invoking interest increase	Financial ratio-based invoking interest increase
Selectivity variable	-0.11 (0.21)	-0.28 (0.24)	0.086 (0.25)
Price effect of covenant	-1.4*** (0.25)	-1.3*** (0.22)	0.13 (0.23)
Log(assets)	-0.44*** (0.081)	-0.48*** (0.084)	-0.57*** (0.091)
Leverage	2.2*** (0.6)	2.2*** (0.63)	2.3*** (0.7)
Tangibility	1.4* (0.7)	1.6** (0.7)	1.5* (0.81)
Cash flow volatility (%)	0.27*** (0.073)	0.26*** (0.077)	0.27*** (0.088)
1 year treasury rate (%)	0.14 (0.36)	0.1 (0.37)	0.083 (0.41)
10-year-2-year Treasury (%)	-1.0*** (0.37)	-1.0*** (0.37)	-0.85** (0.39)
Market-to-book	-1.0** (0.41)	-1.3*** (0.48)	-1.0** (0.5)
Equity return standard deviation (%)	0.18*** (0.038)	0.19*** (0.038)	0.2*** (0.049)
Equity return mean (%)	-1.5*** (0.32)	-1.6*** (0.31)	-1.7*** (0.41)
Year dummies	Y	Y	Y
Industry dummies	Y	Y	Y
Constant	11.5*** (1.5)	12.7*** (1.7)	13.1*** (1.8)
Observations	217	217	217
R ²	0.59	0.58	0.50
Adjusted R ²	0.55	0.54	0.45

Second stage regression results for homogeneous subsamples



	Rating-based covenant invoking interest increase (panel A)	Financial ratios-based covenant invoking interest increase (panel B)
Selectivity variable	-0.13 (0.26)	0.76 (0.58)
Price effect of covenant	-0.23 (0.37)	-0.17 (0.39)
Log(assets)	-0.35 ^{***} (0.1)	-0.13 (0.22)
Leverage	2.2 ^{***} (0.71)	0.3 (1.5)
Tangibility	0.61 (0.73)	0.18 (1.8)
Cash flow volatility (%)	0.21 ^{**} (0.094)	0.11 (0.15)
1 year treasury rate (%)	0.046 (0.1)	0.21 (0.28)
Market-to-book	-1.7 ^{***} (0.35)	0.3 (1.3)
Equity return standard deviation (%)	0.2 ^{***} (0.045)	0.42 ^{***} (0.092)
Equity return mean (%)	-1.7 ^{***} (0.41)	-1.6 ^{**} (0.72)
Constant	9 ^{***} (1.4)	5.2 (3.9)
R ²	0.39	0.31
Adjusted R ²	0.35	0.16
N	161	56

Results (4): Price impact

- Neither rating nor financial ratio-based covenants are associated with lower bond spreads.
- Covenants based on rating do not carry any additional price benefit other than what already follows from being rated.
- In the case of financial ratio-based covenants – the choice of covenant inclusion does not seem to be arbitrary. Possible explanations of the no price effect result:
 - The penalty of the interest compensation is small.
 - The costs imposed by covenants ex-post are exactly matched by their ex-ante benefits.
 - The regulation leads to systematic choice of firms.

Conclusions

- This study empirically examines the effects of the regulation on the use of covenants, their design, and their effect on the price of bonds.
- The exogenously imposed performance-based covenants proved ineffective with regard to monitoring of borrowers and creditors engaging with borrowers outside of bankruptcy.
- Regulation can turn out to be ineffective when it is not based on clear, verifiable and measurable outcomes.
- In public debt markets costs of monitoring and contract renegotiations are high. To lower risk, creditors in public tradable bonds use diversification.