The Debt Structure of Public Firms in Israel 2007-2013

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*Any views expressed in the presentation are those of the author and do not reflect those of the Bank of Israel

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Objective

Investigation of the debt structure of public firms in Israel between 2007 and 2013 based on annual balance sheet data and on their univariate and multivariate analysis.

1. Identification of frequency and of specialization of firms in specific types of debt.

   a. An **arbitrary 30% threshold** for debt ratios was set on the basis of the firm averages of annual observations
   b**. Cluster analysis**. Specialization was obtained by cluster analysis on the basis of single annual firm observation.
   Two cluster groups: Financial and non-financial debt and finanancial debt only.

2. Characteristics of firms for different debts of specialization.

3. Multivariate analysis**: Logit estimation** of the odds of specialization in specific cluster relatively to other clusters, in terms of the cluster firm- characteristics.

The data

Debt types: Nine types of debt and 10 firm characteristics. Nine used in econometric estimation

Main Findings

1) Israeli public firms exhibit a substantial degree of debt specialization, which coincides with debt concentration for non-financial debt but not for financial debt.

2) The cross section data on corporate debt specialization in the context of univariate analysis may serve to derive a road map of the evolution of the debt structure of a public firm in Israel over time.

3) We found that specialization in bond debt is U–shaped in terms of borrower quality.
High quality and large firms specialize in rated bond debt along with L.T Bank debt and low quality smaller firms specialize in unrated bond debt along with short term bank , at the two quality extremes , with high quality smaller firms specializing in bank debt without bonds in the middle.

4) This result was robust to our criterion of debt concentration: Arbitrary > 30% or as the outcome of cluster analysis.

5) The results of econometric estimation of the odds of a firm observation being assigned to a particular debt cluster [LOGIT model] :

a. Lent partial support to the expected contribution to debt specialization of firm characteristics related to informational asymmetry, agency costs and to costs of default.

b. They corroborated the conjecture of the U-shape relationship between firm quality and specialization in public debt.

c. They confirmed the effect of industry affiliation on debt specialization in excess of that of firm characteristics.

The Firm Distribution of Debt

	Bank debt		Bond debt				Convertible bonds		Current	Suppliers	Stakeholders	Other
Number of firms	413		259				140		475	523	116	527
% of tot. firms	78.2%		49.1%				26.5%		90.0%	99.1%	22.0%	99.8%
Assets of these firms/Assets all firms	15.0%		14.2%				5.6%		15.1%	14.9%	1.3%	15.2%
Median ratio of this debt	13.7%		20.9%				3.1%		19.3%	28.7%	2.1%	11.0%
Median debt ratio of all firms	7.8%		0.0%				0.0%		17.7%	28.3%	0.0%	11.0%
	B. only	B&B	Rated bonds 156		Unrated bonds 103		With bonds	Without bonds				
	171	242	Rated p.p 77	Rated no p.p 79	Unrated p.p 12	Unrated no p.p 91	83	57				
	32.4%	45.8%	14.6%	15.0%	2.3%	17.2	15.7%	10.8%				
	0.9%	14.1%	10.5%	2.5%	0.1%	1.0%	5.4%	0.2%				
	11.3%	15.2%	24.4%	18.0%	16.8%	18.4%	2.2%	8.2%				
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				

What do we learn?

Percentage of firms with debt ratios greater than 0-90%

Panel A **Type of debt and debt ratios**	**0%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**
Bank LT debt Total	78.4%	36.3%		15.3%		4.2%	2.1%	0.6%
Banks only	32.6%	**17.4%**		8.7%		3.0%	1.9%	0.6%
Banks and bonds (Bank Credit)	45.8%	**18.9%**		6.6%		1.1%	0.12%	0.0%
Cur. Debt	90.2%	**61.8%**		**38.0%**		**21.4%**	**15.1%**	9.5%
Total bonds	49.1%	27.8%		10.4%		2.8%	0.9%	0.6%
Bonds Rated	29.5%	17.4%		6.6%		1.5%	0.4%	0.2%
Bonds Unrated	19.5%	10.4%		3.8%		1.3%	0.6%	0.4%
Convertibles	26.5%	4.5%		3.2%		2.3%	1.7%	1.3%
Stakeholders	22.0%	3.0%		1.5%		1.3%	1.3%	1.1%
Financial Total Financial Tot.- Cur.Debt				**68.4%** **30.4%**		**31.9%** **10.6%**	**21.2%** **6.0%**	**13.0%** **3.6%**
Panel B **Type of debt and debt ratios**	**0%**	30%		**50%**		**70%**	**80%**	**90%**
Bank LT debt Total	78.4%	17.2%		4.7%		0.9%	0.0%	0.0%
Banks only	32.6%	5.5%		1.9%		0.8%	0.0%	0.0%
Banks and bonds	45.8%	11.7%		2.8%		0.2%	0.0%	0.0%
Cur. Debt	90.2%	**22.5%**		3.2%		0.9%	0.2%	0.0%
Total bonds	49.1%	13.3%		**3.2%**		0.4%	0.2%	0.0%
Bonds Rated	29.5%	8.5%		2.3%		0.0%	0.0%	0.0%
Bonds Unrated	19.5%	4.7%		0.9%		0.4%	0.2%	0.0%
Convertibles	26.5%	1.9%		0.6%		0.4%	0.0%	0.0%
Stakeholders	22.0%	0.2%		0.0%		0.0%	0.0%	0.0%
Financial total				**11.7%**		**2.6%**	**0.4%**	**0.0%**
Suppliers	99.1%	**47.7%**		**23.7%**		11.4%	6.6%	1.7%
Other Cur. Liabilities	99.8%	**21.4%**		**10.4%**		4.9%	1.9%	1.1%
Total		36.3%		**45.8%**		18.9%	8.9%	2.8%

Debt types with median ratios (>5%) in the debt group of specialization (>30%)

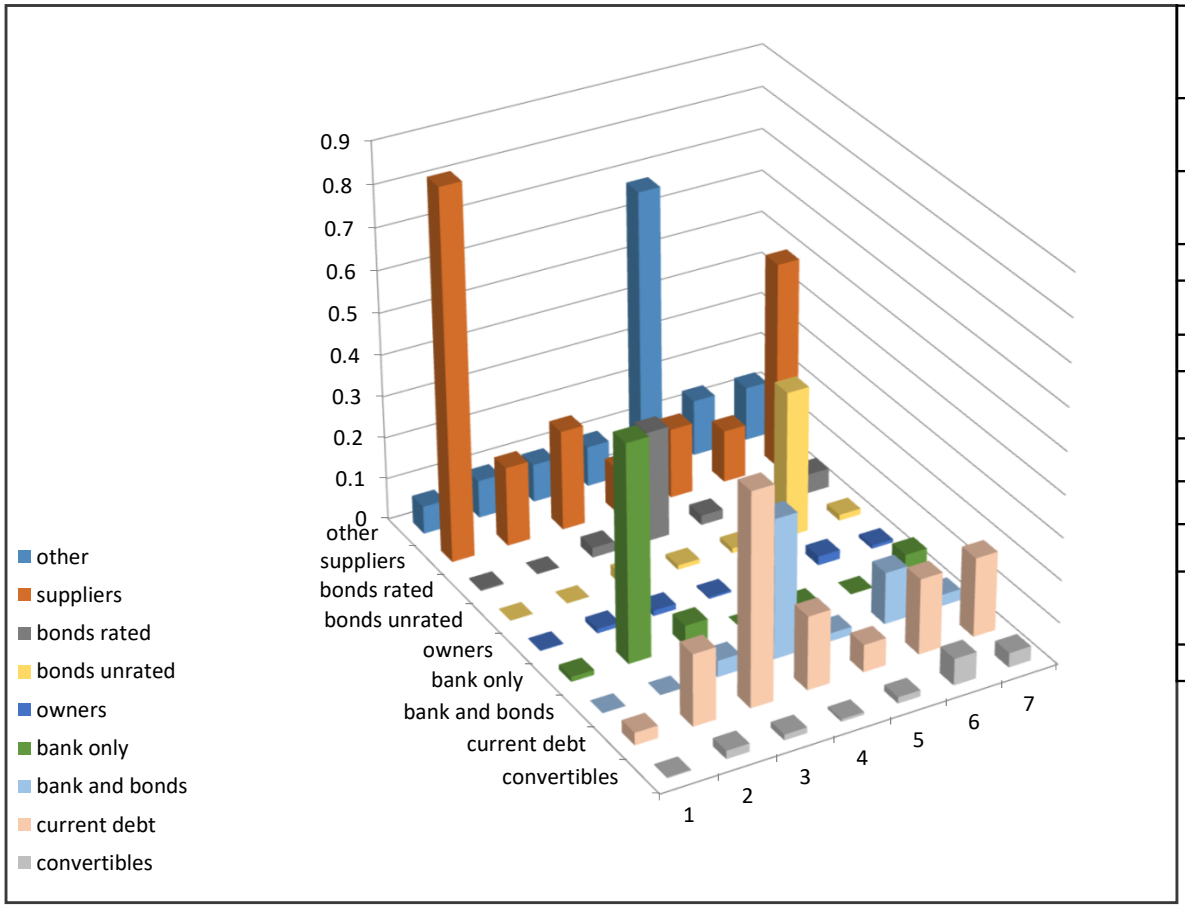
(medians of firm averages of annual observations)

Specialization ↓ / Diversification →					HHI	Debt group
Debt type % of firms specializing in this debt	Additional types of debt (Median debt ratio, # of firms with debt ratios>30%)					
Other debt 21.4%	Suppliers 16.9%, 35	Current debt 6.9%, 7			50.1%	Other-Suppliers-Current
Debt to suppliers 47.7%	Current debt 14.9%, 53	Other debt 9.4%, 35			48.1%	Suppliers-Current-Other
Convertible bonds 1.9%	Other debt 26.5%, 5	Suppliers 9.4%, 4	Current debt 5.6%, 0		44.9%	Convertible-Other-Suppliers-Current
Current debt 22.5%	Suppliers 26.3%, 53	Other debt 6.5%, 7			36.5%	Current-Suppliers-Other
Banks only 5.5%	Suppliers 21.5%, 8	Current debt 17.4%, 6	Other debt 6.5%, 2		37.8%	Banks Only-Suppliers-Current-Other
Banks & Bonds 11.7%	Current debt 18.3%, 6	Rated bonds 13.0%, 11	Other debt 7.1%, 1	Suppliers 5.9%, 2	34.7%	Banks-Current-Rated bonds-Other-Suppliers
Unrated bond debt 4.7%	Current debt 14.0%, 4	Other debt 9.1%, 3	Suppliers 9.9%, 4		35.3%	Unrated bonds-Current-Other-Suppliers
Rated bonds 8.5%	Banks & bonds 20.1%, 11	Cur. debt 13.3%, 1	Other debt 6.9%, 3	Suppliers 5.7%, 5	35.1%	Rated-Banks L.T-Current-Other-Suppliers

Can this cross section debt structure serve as a blueprint of its evolution over time for a public firm in Israel?

Financial and Non-Financial Debt Clusters

(K-Means, Debt ratios to total debt*, annual observations)



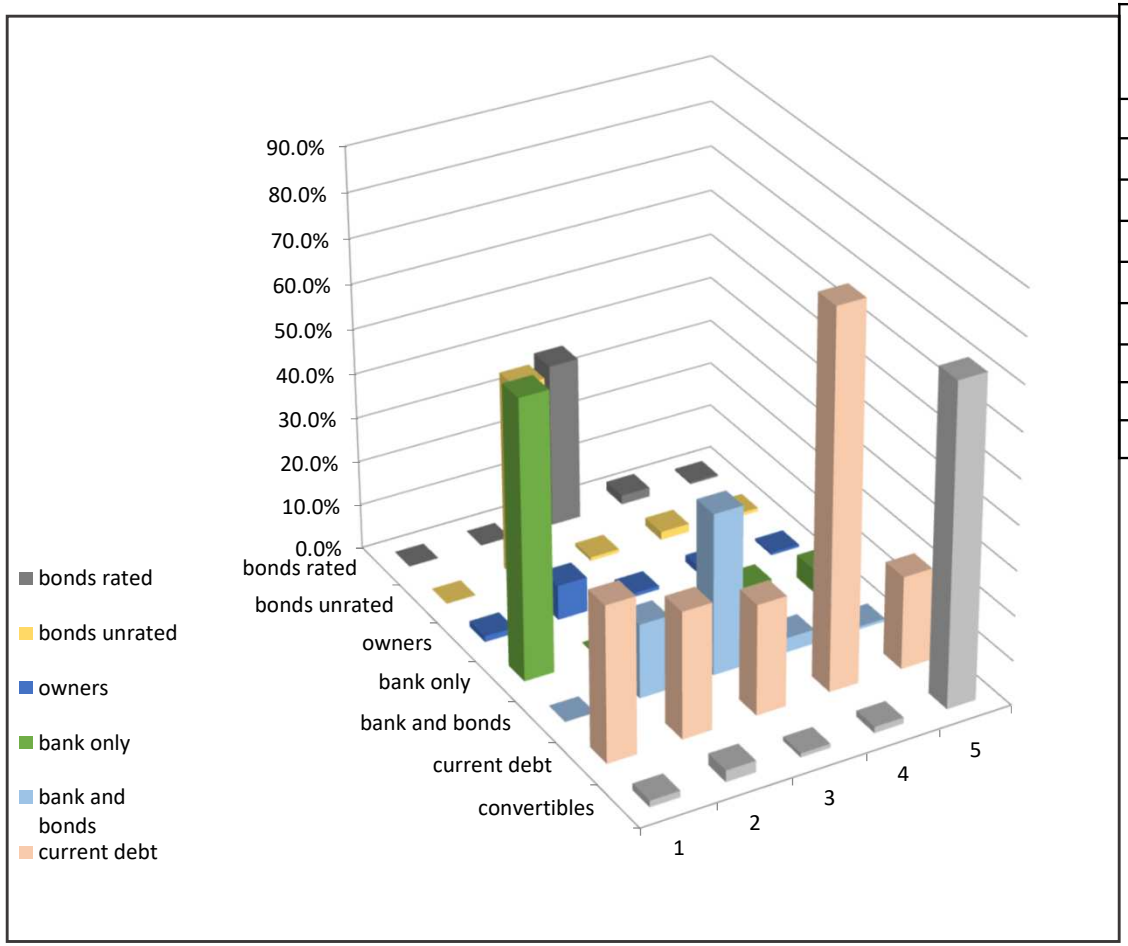
Clusters/ Types of debt	Suppliers 1	Banks Only	Current Debt	Banks & bonds	Other debt	Unrated bonds	Suppliers 2
Other	6.6%	9.0%	9.1%	9.6%	67.8 %	13.5%	13.0%
Debt to suppliers	88.3%	19.0%	23.9%	10.9%	16.8 %	12.5%	49.6%
Rated bonds	0.4%	0.0%	2.4%	26.4%	2.3%	0.0%	4.6%
Unrated bonds	0.0%	0.0%	2.5%	1.0%	1.2%	35.1%	1.4%
Banks with bonds	0.1%	0.0%	3.9%	33.3%	1.9%	12.3%	2.7%
Bank credit L.T no bonds	1.2%	51.8%	4.9%	0.0%	1.2%	0.1%	5.5%
Current debt S.T	3.0%	17.2%	50.5%	17.5%	6.5%	18.0%	18.9%
Convertibles	0.3%	2.0%	1.4%	0.6%	1.5%	6.3%	3.4%
Stakeholders	0.2%	1.1%	1.3%	0.4%	0.6%	2.2%	1.0%
HHI	81.2%	36.0%	37.2%	31.6%	52.0 %	29.3%	37.0%
#of observations	413	194	504	631	467	301	633

*Total non-capital liabilities net of taxes and pension liabilities

Other-Suppliers-Current **Cluster 5**
Suppliers-Current-Other **Cluster 1**
Current-Suppliers-Other **Cluster 3**
Banks Only-Suppliers-Current-Other **Cluster 2**
Rated bonds-Banks-Current-Other-Suppliers **Cluster 4**
Unrated bonds-Current-Other-Suppliers-Banks **Cluster 6**

Financial Debt Clusters

(K-Means, Debt ratios to total debt*, annual observations)



Clusters/Types of debt	Banks Only	Unrated Bonds	Banks & Bonds	Current Debt	Convertibles
Rated bonds	0.0%	0.0%	36.7%	2.1%	0.4%
Unrated bonds	0.0%	44.6%	0.8%	1.8%	0.8%
Banks with bonds	0.0%	16.6%	36.1%	3.2%	0.6%
Bank credit long term	62.5%	0.2%	0.0%	6.1%	5.2%
Current credit (Sh.T)	34.8%	28.3%	24.7%	83.9%	20.8%
Convertibles	1.4%	2.6%	0.9%	1.4%	71.7%
Stakeholders	1.3%	7.8%	0.8%	1.6%	0.5%
HHI	52.3%	41.8%	43.4%	76.2%	55.0%
# of observations	442	444	842	865	104

*Total non-capital liabilities net of taxes and pension liabilities

Firm characteristics	Why and how do these variables affect corporate debt structure?
	Departure from the frictionless environment of M-M (1958) implies that a firm's capital structure may affect its value.
Size	Costly financial frictions. Firm characteristics induce or reduce these frictions.
Age	Different frictions lead to different capital and thereby debt structures.
RoA	Origin of the frictions:
RoA volatility	Moral hazard emanating from conflicts of interest (borrowers and lenders, agents-principals)
Investments/assets	Informational asymmetry (risk of adverse selection) between borrowers and lenders.
R&D	Costs of default : Ex-post: debt restructuring and bankruptcies Ex-ante: Probability of default X Ex-post costs of default.
Retained Earnings	Accessibility of Markets
Tangibility	
Leverage	

Source of friction				
Type of debt	Moral hazard	Informational asymmetry	Costs of default	Accessibility of markets
Monitored debt **Long-term**	Mild	Low asymmetry	Medium Probability of default High costs conditional on default	High emission costs
Short-term **Long-term with covenants**	High-severe Intensive monitoring	High asymmetry	High probability of default High costs conditional on default	
Public debt	Low	Very low asymmetry	Low probability of default Low costs conditional on default	
Public debt with covenants and monitoring capacity	Mild-high		Higher probability of default Low costs conditional on default	
Convertible Bonds **Market mechanism**	Risk shifting	Without risk shifting		

Findings

Financial vs non-financial debt (K-S tests)

- Firm observations with specialization in bank debt without bonds and in unrated and rated (with simultaneous specialization in L.T. Bank debt) bonds exhibit greater size than firms with specialization and high concentration in non-financial debt.

- Firm observations with specialization in bank debt without bonds and with bonds (rated) and in Current debt are more mature than firms with specialization and high concentration in non financial debt.

- Firm observations with specialization in unrated bond debt are also characterized by "young age".

- Firms specializing in debt to suppliers (second cluster) but do not exhibit high concentration are situated in the middle of the size-age spectrum.

- All firms specializing in non-financial regardless of debt concentration exhibit higher R&D and Investment/Assets ratios and lower leverage and asset tangibility, than firms with financial debt.

Firm observations with **high concentration on non-financial debt** are also characterized by lower profitability and higher profit volatility than firm observations with specialization in financial debt with the exception of specialization in unrated bonds.

Some 87% of firm observations of bio-tech firms were assigned in the three clusters with specialization in non-financial debt. They account for close to 50% of the observations of high concentration in non-financial debt.

Financial debt (K-S tests) Blueprint

- Firms and firm observations exhibiting specialization in rated bond simultaneously with L.T bank debt are the largest firms and the most mature along with firms without bonds specializing in bank debt.

  Firms specializing in current debt and unrated bond debt are at the medium-small size, and age range.

  Firm observations with specialization in convertible bonds exhibit the lowest maturity and smallest size, with low profitability, asset tangibility and leverage along with high profit volatility, with 36% of observations attributed to the bio-tech industry.

- With the exception of firm observations with specialization and low concentration in debt to suppliers, firm observations with specialization in bank debt without bonds and in bank debt with rated bonds are the most profitable and exhibit the highest asset tangibility and the lowest profit volatility. **This outcome is robust for the five cluster group.**

- Firms and firm observations with specialization in current debt are in the medium range of firm characteristics in both cluster groups.

- The hypothesis of independence between debt specialization and industry affiliation is rejected by a X^2 test of independence.

- Two findings stand out in the case of financial debt:
  The low leverage of firms specializing in bank debt without bonds in both cluster groups relatively to observations with bond debt rated and especially unrated.

  The low quality profile of firms specializing in unrated bond debt: low profitability, the highest profit volatility and medium range asset tangibility in spite of their access to public debt. The quality-public debt relationship exhibits a U-shape.

Debt specialization and Industrial affiliation		
Debt specialization		Industrial Affiliation
Bank L.T no bonds	Seven Clusters	Bio-Tech
	Five Clusters	Bio-Tech Manufacturing
Bank LT debt Rated bonds	Seven Clusters	R.Estate-Holding
	Five Clusters	R.Estate-Holding
Unrated bonds	Seven Clusters	R.Estate-Holding
	Five Clusters	R.Estate-Holding
Current debt	Seven Clusters	Manufacturing
	Five Clusters	Manufacturing Bio-Tech
Convertible bonds		Bio-Tech
Debt to suppliers 1		Bio-Tech
Other Debt		Bio-Tech
Debt to suppliers 2		Manufacturing Bio-Tech

Questions:

1) Are indeed firms specializing in unrated bond debt low quality?

2) Are the results of univariate analysis in line with theoretical predictions and empirical experience?

3) Do the conclusions of univariate analysis remain robust in the context of multivariate analysis?

Does industrial affiliation contribute to debt specialization?

Q: 1 Apparently they are: The hypothesis of independence between issuing rated bonds and the incidence of defaults was rejected by a test for independence between the two.

Q: 2 Our results concur mostly with theoretical predictions and empirical findings in other work.

Profitable firms specialize in bank debt because they stand to gain from monitoring [Hoshi et al.(1990)]. Uninformed lenders may classify them as low quality , enhancing M.H activity if rating is costly. These firms exhibit higher profit volatility than firms specializing in rated bond debt.

They avoid the risk of foregone profits because of premature liquidation by uninformed lenders.
They overcome Moral Hazard and high capital costs through enforcement of contractibility.
Smaller size raises costs of emission of public debt because of fixed components.

The lower profitability and higher volatility of firm observations with specialization in current debt are consistent with specialization in short-term bank debt allowing disengagement of banks prior to default [Rajan and Winton (1995)].

The dependence of bio-tech on monitored debt is also consistent with the avoidance of premature liquidations by uninformed lenders and the loss of profitable opportunities, protected also by private debt (non-disclosure)

- Mature firms with high and steady profitability and high tangibility specialize in rated bonds. No gain from monitored debt because :
  Cost of foregone high profits averts risk shifting.
  Loss of reputation does the same for firms with rated debt.[Diamond (1991)].
  High tangibility functioning as “skin in the game”, reduces engagement in activities tainted by moral hazard [Repullo and Suarez (2000)].

- High tangibility serves as insurance for informational asymmetry.
  High coverage of large firms reduces informational asymmetry, weakening necessity of information collecting lenders (screening).

- Size reduces fixed costs of issuing debt (Accessibility of credit markets).

- Their risk of default and default costs are low because of:
  Stable and high profitability and risk diversification due to size [Rajan and Zingales (1995)].
  Default and liquidation costs, therefore, lower. Reliance on monitored and concentrated debt is therefore limited.
  [Gilson et al.(1990), Franks and Torous (1990), Bolton and Scharfstein 1996), Ivashina et al. (2016)].

  The same for avoidance of cost of premature liquidation by uninformed lenders. (No reason for liquidation)

- Convertible bonds serve to finance firms whose activity is characterized by informational asymmetry and may be suspected of risk shifting [Stein (1992)]. This is the type of firms which issue such bonds.

Q3: Industrial affiliation accounts for firm characteristics related to informational asymmetry and to costs of default. *****

The Log of the Odds of Specialization In Clusters of Corporate Financial Debt vs. non- Financial debt

Dependent Variable:	Clusters (2)/(1) (1)	Clusters (2) /(5) (2)	Clusters (4)/(1) (3)	Clusters (4)/(5) (4)	Clusters (6)/(1) (5)	Clusters (6)/(5) (6)
ROA	-----	-----	-----	1.162 (.103)	-----	1.149** (.043)
Retained Earnings	0.499*** (.000)	0.457*** (.003)	0.831*** (.000)	0.789*** (.000)	0.122 (.118)	-----

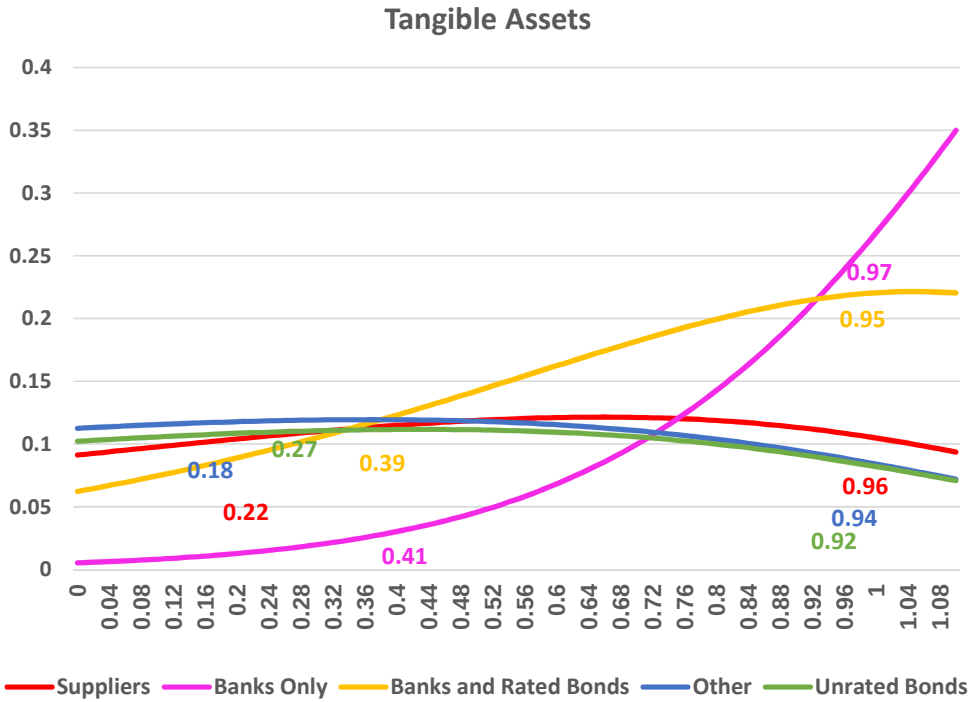
The Log of the Odds of specialization across Clusters of Corporate Financial Debt

Dependent Variable:	Clusters (4)/(2) (1)	Clusters (4)/(6) (2)	Clusters(4)/(7) (3)	Clusters(2)/(6) (4)	Clusters(2)/(7) (5)	Clusters (2)/(3) (6)	Clusters(6)/(3) (7)
ROA	-----	-----	-----	-----	-----	-----	0.916 (.156)
Retained Earnings	0.332 (.154)	0.709*** (.000)	0.729*** (.000)	0.377** (.022)	0.397** (.011)	-----	-0.205* (.063)

Cluster 1= Sp. in debt to suppliers with high concentration **Cluster 4**= Sp. In L.T bank debt with rated bonds
Cluster 2= Sp. In L.T bank debt without bonds**.** **Cluster 5**= Sp. In "other debt".
Cluster 3= Sp. in Current debt **Cluster 6**= Sp. in unrated bond debt **Cluster 7**=Sp. In debt to suppliers, low concentration

Dependent Variable:	Clusters (2)/(1) (1)	Clusters (2) /(5) (2)	Clusters (4)/(1) (3)	Clusters (4)/(5) (4)	Clusters (6)/(1) (5)	Clusters (6)/(5) (6)
Tangible Assets	3.788*** (.000)	4.219*** (.000)	1.125*** (.002)	1.556*** (.000)	-----	-----

Dependent Variable:	Clusters (4)/(2) (1)	Clusters (4)/(6) (2)	Clusters(4)/(7) (3)	Clusters(2)/(6) (4)	Clusters(2)/(7) (5)	Clusters (2)/(3) (6)	Clusters(6)/(3) (7)
Tangible Assets	-2.663*** (.000)	1.483*** (.000)	2.595*** (.000)	4.146*** (.003)	5.258*** (.000)	4.526*** (.000)	-----



Asset tangibility raises the odds of specialization in financial debt against non-financial debt.

Higher asset tangibility raises the odds of specialization in L.T bank debt and rated bonds and in bank debt without bonds against specialization in other financial debt.

Contrary to predictions the odds of specialization in bank debt without bonds increase against specialization in rated bond debt.

Dependent Variable:	Clusters (2)/(1) (1)	Clusters (2) /(5) (2)	Clusters (4)/(1) (3)	Clusters (4)/(5) (4)	Clusters (6)/(1) (5)	Clusters (6)/(5) (6)
Size	0.759*** (.000)	-0.147*** (.000)	0.905*** (.000)	-----	0.856*** (.000)	-0.051*** (.000)
Age	-----	0.036*** (.000)	-0.011** (.019)	0.017*** (.000)	-0.021*** (.000)	-----

Cluster 1= Sp. in debt to suppliers with high concentration **Cluster 4**= Sp. In L.T bank debt with rated bonds
Cluster 2= Sp. In L.T bank debt without bonds**.** **Cluster 5**= Sp. In "other debt".
Cluster 3= Sp. in Current debt **Cluster 6**= Sp. in unrated bond debt **Cluster 7**=Sp. In debt to suppliers, low concentration

Dependent Variable:	Clusters (4)/(2) (1)	Clusters (4)/(6) (2)	Clusters(4)/(7) (3)	Clusters(2)/(6) (4)	Clusters(2)/(7) (5)	Clusters (2)/(3) (6)	Clusters(6)/(3) (7)
Size	0.146*** (.000)	0.049*** (.000)	0.072*** (.000)	-0.097*** (.000)	-0.074*** (.002)	-----	0.110*** (.000)
Age	-0.018*** (.000)	0.010** (.034)	-0.008** (.037)	0.028*** (.000)	0.010** (.041)	0.017*** (.001)	-0.012 (.017)

Size raises the odds of Specializing in bond debt and in particular rated bond debt with L.T bank debt.

Age raises the odds of specialization in bank debt without bonds and in debt to suppliers with low concentration. But reduces the odds of specializing in unrated bond debt

Dependent Variable:	Clusters (4)/(2) (1)		Clusters(4)/(7) (3)	Clusters(2)/(6) (4)		Clusters (2)/(3) (6)	Clusters(6)/(3) (7)
Industries Manufacturing	-0.574** (.03)		-0.914*** (.000)	0.681** (.035)		-----	-1.008*** (.000)
Construction and R.Estate	1.516*** (.000)		2.420*** (.000)	-1.865*** (.000)		-0.959*** (.001)	0.906*** (.000)
Holding	-----		1.395*** (.000)	-0.941*** (.007)		-----	0.870*** (.001)
Biotech	-----		-1.394*** (.001)	-----		0.752** (.046)	1.293*** (.000)

Dependent Variable:	Clusters (2)/(1) (1)	Clusters (3)/(1) (2)	Clusters(4)/(1) (3)		Clusters(3)/(2) (5)	Clusters (4)/(2) (6)	Clusters(5)/(2) (7)
Industries Manufacturing	-0.565** (.013)	-0.397** (.042)	-----		-----	0.454 (.029)	0.876** (.016)
Construction and R.Estate	1.772*** (.000)	1.577*** (.000)	0.630*** (.004)		-----	-1.142*** (.000)	-1.261*** (.003)
Holding	1.189*** (.000)	0.582** (.042)	-----		-0.607*** (.007)	-0.825*** (.000)	-----
Biotech	-----	-----	-0.459** (.018)		-----	-----	0.524 (.135)

Cluster 1= Sp. in bank debt without bonds **Cluster 3**=Sp. in L.T bank debt with rated bonds

Cluster 2=Sp. In unrated bond debt **Cluster 4**=Sp. In unrated bond debt **Cluster 5**= Sp. In convertible bonds

Clusters	Suppliers 1	Banks Only	Current Debt	Banks and Rated Bonds	Other Debt	Unrated Bonds	Suppliers 2
Independent Variable							
Size	-0.105	-0.007	-0.017	0.353	0.154	0.037	0.044
Age	0.048	0.069	-0.004	-0.019	-0.080	-0.053	0.050
ROA	-0.009	0.000	-0.016	0.012	-0.055	0.007	0.017
ROA Volatility	0.026	-0.018	0.003	0.011	0.011	0.003	-0.025
Tangible Assets	0.003	0.214	-0.086	0.096	-0.026	-0.019	-0.142
R&D	0.025	0.010	0.020	0.000	0.029	0.015	0.037
Retaind Earnings	-0.162	0.014	0.011	0.066	-0.076	-0.013	-0.035

Thank you

Independence test: Cluster Allocation vs. Industry Affiliation

Clusters	Banks only	Unrated Bonds	Banks and Rated Bonds	Current Debt	Convertibles	Total # of observations
	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	
Commerce	103 100.6 0.1	86 101.1 2.3	170 191.7 2.5	234 196.9 7.0	21 23.7 0.3	614
Construction &R.E	57 121.9 34.6	171 122.5 19.2 39% 23%	360 232.3 70.2 43% 48%	145 238.6 36.7	11 28.7 10.9	744
Manufacturing	176 104.1 49.7 40% 28%	51 104.5 27.4	123 198.2 28.6	257 203.7 14.0 30% 40%	28 24.5 0.5	635
Holding Comp.	24 51.6 14.8	73 51.9 8.6 16% 23%	143 98.3 20.3 17% 45%	67 101.0 11.5	8 12.1 1.4	315
Bio-tech	82 63.8 5.2 19% 21%	63 64.0 0.0	46 121.4 46.9	162 124.8 11.1 19% 42%	36 15.0 29.4 35% 9%	389
Total # of observations	442	444	842	865	104	2697
X^2 = 453.1	Df=16					

Independence Test: Cluster Allocation and Industry Affiliation

Clusters/ Industries	Suppliers 1	Banks only	Current Debt	Banks & (Rated) Bonds	Other Debt	Unrated Bonds	Suppliers 2	Total # of observations
	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	# of observations # of exp.observations X^2 component	
Commerce	103 89.5 2.0	43 42.0 0.0	128 109.2 3.2	114 136.7 3.8	61 101.2 16.0	53 65.2 2.3	179 137.2 12.8	681
Construction &R.E	22 100.4 61.2	45 47.2 0.1	121 122.5 0.0	328 153.4 198.8 52% 49%	93 113.5 3.7	132 73.2 47.3 44% 20%	23 153.9 11.3	764
Manufcturing	72 88.7 3.1	67 41.7 15.4 35% 19%	179 108.2 46.3 36% 51%	69 135.5 32.6	31 100.3 47.9	26 64.6 23.1	231 135.9 66.5 36% 66%	675
Holding Comp.	30 46.1 5.6	22 21.7 0.0	48 56.3 1.2	111 70.5 23.3 18% 32%	62 52.2 1.9	56 33.6 14.9 19% 16%	22 70.7 33.5	351
Bio-tech	186 88.3 108 45% 28%	17 41.5 14.4	28 107.8 59.0	9 134.9 117.5	220 99.8 144.6 47% 33%	34 64.4 14.3	178 135.3 13.4 28% 26%	672
Total # of observations	413	194	504	631	467	301	633	3143
X^2 = 1249.3	DF=24							

Firm characteristics across clusters of financial debt

(Annual firm observations, the order of magnitude of the firm characteristic across clusters in parenthesis)

Clusters	Banks Only	Unrated Bonds	Banks & Rated Bonds	Current	Convertibles
Firm Characteristics					
Firm size	77.9% (3)	95.5% (2)	677.4% (1)	72.8% (3)	41.1% (4)
Age	30 (1)	22 (3)	28 (1)	25 (2)	16 (4)
Roa	5.8% (1)	3.1% (4)	5.3% (2)	4.5% (3)	0.4% (5)
RoA volatility	62.6% (3)	97.4% (1)	47.7% (4)	72.9% (2)	73.3% (2)
Investments/assets	-14.7% (3)	-20.4% (2)	-31.3% (4)	16.3% (2)	-16.0% (1)
R&D	0.0% (2)	0.0% (4)	0.0% (4)	0.0% (3)	0.0% (1)
Retained earnings	16.1% (1)	2.1% (3)	8.8% (2)	7.8% (2)	-10.1% (4)
Tangibility	64.1% (2)	61.6% (3)	68.3% (1)	55.3% (5)	58.4% (4)
Tangibility no cash	57.7% (2)	49.4% (3)	61.6% (1)	46.9% (4)	33.5% (5)
Leverage	52.0% (4)	74.9% (1)	72.4% (2)	60.4% (3)	57.4% (3)
HHI	52.27%	41.81%	43.35%	76.18%	55.01%
Defaulted firms	30	90	82	91	30
# of obs. in cluster	442	444	842	865	104

Table 10A: Firm characteristics across clusters of corporate debt

(Annual firm observations, the order of magnitude of the firm characteristic across clusters in parenthesis)

Clusters	Suppliers 1	Banks Only	Current	Banks & Bond	Other	Unrated Bonds	Suppliers 2
Firm characteristics	Median Values						
Firm size	20.8% (4)	96.6% (2)	90.5% (3)	804.7%(1)	68.2% (2)	95.7% (2)	77.1% (2)
Age	22 (4)	35 (1)	2 (3)	28 (2)	17 (5)	21 (4)	25 (3)
Roa	4.0% (3)	5.4% (2)	4.2% (3)	5.2% (2)	0.0% (5)	2.53% (4)	6.4% (1)
Retained earnings	0.55% (4)	16.37% (1)	9.42% (3)	8.09% (2)	-8.78% (5)	1.58% (4)	11.0% (2)
RoA volatility	69.1% (3)	56.4% (4)	71.7% (3)	51.6% (4)	83.3% (2)	112.7% (1)	55.2% (5)
Investments/assets	-19.1% (1)	-12.1% (5)	-12.6% (2)	-34.1% (6)	-40.5% (3)	-27.8% (4)	-18.11 (5)
R&D	0.0% (2)	0.0% (4)	0.0% (5)	0.0% (5)	0.1% (1)	0.0% (4)	0.0% (3)
Tangibility	59.2% (4)	78.8% (1)	58.1% (4)	77.4% (2)	61.9% (4)	64.5% (3)	52.6% (5)
Tangibility no cash	34.4% (6)	71.9% (1)	54.1% (3)	72.8% (2)	32.9% (6)	52.1% (4)	41.9% (5)
Leverage	26.3% (6)	57.9% (4)	69.6% (3)	72.4% (2)	46.4% (5)	74.9% (1)	55.8% (5)
HHI	81.2%	36.0%	37.2%	31.6%	52.0%	29.3%	37.0%
Defaulted firms	29	6	67	59	52	70	68
# of obs. in cluster	413	194	504	631	467	301	633