



Volume 35, Issue 4

Debt Maturity, Ownership Concentration, and Firm Efficiency

Samuele Murtinu

Università Cattolica del Sacro Cuore

Abstract

I study the relationship between debt maturity and agency conflicts between controlling and minority shareholders in unlisted firms. Exploiting cross-province variance in the development of local credit markets, I find that the monitoring effect of short-term bank debt is more effective in firms with less concentrated ownership structures.

The current version of this study has benefited from comments offered by Mario D. Amore, Narjess Boubakri, Sadok El Ghouli, and Omrane Guedhami. I also thank Francesca Lotti for providing me with some of the data used in this study. Responsibility for any errors lies solely with the author.

Citation: Samuele Murtinu, (2015) "Debt Maturity, Ownership Concentration, and Firm Efficiency", *Economics Bulletin*, Volume 35, Issue 4, pages 2610-2616

Contact: Samuele Murtinu - samuele.murtinu@unicatt.it.

Submitted: July 20, 2015. **Published:** December 13, 2015.

1. Introduction

Several scholars investigated the impact of ownership concentration on firm performance (for a review see Demsetz and Villalonga 2001). Most studies have used firm value as dependent variable and have focused on listed firms located in the US. Central to these works is the agency theory (Jensen and Meckling 1976) that explains the conflict between inside controlling shareholders - who are active in running the firm, and choosing the management/executive positions (Pagano and Röell 1998; Shleifer and Vishny 1997) - and outside minority shareholders.

A more recent literature has studied the relationship between ownership structure and firm performance in unlisted entrepreneurial firms (Colombo et al. 2014). Such literature has shown that bank monitoring is an effective governance mechanism to reduce potential agency costs between the two typical types of owners of unlisted entrepreneurial firms: *owner-managers* (controlling shareholders and corporate decision makers) and *non-manager individual shareholders*. First, the higher is the debt-to-asset ratio, the higher is the threat of bankruptcy, and the less opportunistic are the corporate decisions of owner-managers. Second, bank monitoring is an increasing function of a firm's default risk (Harvey et al. 2004) - which is positively related to the debt-to-asset ratio. Finally, bank monitoring is a powerful disciplining practice to unlisted firms because of less alternative external corporate governance mechanisms than those available to listed firms (Ang et al. 2000). As shown by Colombo et al. (2014), banks require unlisted firms to “use their assets more efficiently and discourage perquisite consumption, producing positive effects on firms’ performance” (p. 268). This argument is in line with Jensen's free cash flow hypothesis (1986) that financial debt impacts on a firm's efficiency.

I claim that the monitoring function of bank debt is not effective *per se* but it depends on debt maturity. Shortening debt maturity would make it more likely that banks will restrict managerial discretion. The extant literature has studied the impact of managerial stock ownership on the maturity structure of corporate debt (Datta et al. 2005), and how short-term debt in listed firms mitigates the agency costs between managers and shareholders. However, there is no evidence on the relationship between debt maturity and conflicts between controlling shareholders and minority shareholders. The second contribution of the paper is that bank monitoring might be influenced by a firm's ownership concentration. As shown by Claessens et al. (2002), ownership concentration positively impacts firm performance when cash-flow rights are aligned with control rights - as is the case of unlisted entrepreneurial firms. Short-term debt increases exposure to credit and liquidity risks, and reduces the opportunism of owner-managers. However, such opportunism is lower when ownership is concentrated: the controlling shareholders’ cash flow rights increase, and hence their motivation for

expropriation decreases. Thus, the higher is the ownership concentration, the lower is the monitoring effect of short-term bank debt.

2. Data

I consider a sample of independent¹ Italian owner-managed unlisted firms that are less than 25 years old, and are observed in the period 1994–2008. The sample was extracted from the RITA (Research on Entrepreneurship in Advanced Technologies) database, which is the most complete and detailed source of information available for this type of firms in Italy.² Data have been gathered from secondary sources and a series of national surveys administered in the time period 2000-2009 (for details, see Colombo et al. 2014). I built the complete history of the ownership structure for a sample of 134 firms. χ^2 tests show that there are no statistically significant differences between the distribution of the 134 sampled firms across geographic areas and the corresponding distribution of the RITA population from which the sample was drawn ($\chi^2(19)= 23.538$).

Table 1
Univariate tests

Panel A: mean		Obs.	Mean efficiency	Δ Efficiency
Highly concentrated ownership	High short-term bank debt	165	2.2518 (0.2640)	0.0047
	Low short-term bank debt	202	2.2471 (0.4694)	(0.0389)
Non-highly concentrated ownership	High short-term bank debt	205	2.3044 (0.3876)	0.1227**
	Low short-term bank debt	169	2.1817 (0.5660)	(0.0513)
Panel B: median		Obs.	Median efficiency	Δ Efficiency
Highly concentrated ownership	High short-term bank debt	165	2.2196 (0.2640)	-0.0046
	Low short-term bank debt	202	2.2242 (0.4694)	[p=0.789]
Non-highly concentrated ownership	High short-term bank debt	205	2.1935 (0.3876)	-0.0251
	Low short-term bank debt	169	2.2186 (0.5660)	[p=0.755]

Legend. In the last column, I report two-sample mean comparison t tests (Panel A) and nonparametric K-sample median comparison tests (Panel B). Standard errors in round brackets. p-values associated with Pearson γ^2 statistics in square brackets. ** p<0.05.

¹ Sampled firms are not controlled by other firms although other firms may hold minority shareholdings.

² The use of the RITA database is well-established in the economics literature. See e.g., Colombo et al. (2004, 2011), Colombo and Grilli (2013).

In Table 1, I show summary statistics of firm efficiency, measured as the asset utilization ratio. This latter is the annual sales value divided by total assets in logarithms – a standard metric in the financial economics literature (Ang et al. 2000). I distinguish between: i) firms with a higher and those with a lower ownership concentration than the median value (0.3642), and ii) firms with a higher and those with a lower short-term debt-to-asset ratio than the median value (0.64).³ Ownership concentration is the Herfindahl-Hirschman measure of share concentration: $\sum_{i=1}^n S_i^2$, where S_i is the percentage of equity held by the owner i , and n is the total number of owners. Two-sample mean comparison t tests show that the monitoring effect of short-term bank debt is more effective in firms with less concentrated ownership structures. Nonparametric K-sample median comparison tests do not confirm this univariate result, and this may be explained by the distributions of the ownership concentration and short-term bank debt (see Figure 1 and Figure 2).

3. Econometric specification

I specify the following equation:

$$Efficiency_{it} = \beta_0 + \beta_1 OwnConc_{it} + \beta_2 ShortDTA_{it} + \beta_3 OwnConc_{it} * ShortDTA_{it} + \beta_4 X_{it} + \gamma_t + \delta_i + \varepsilon_{it}. \quad (1)$$

$Efficiency_{it}$ is the asset utilization ratio, $OwnConc_{it}$ is the ownership concentration,⁴ and $ShortDTA_{it}$ is the short-term debt-to-asset ratio. X_{it} includes the operating cash-flow-to-asset ratio ($CFTA_{it}$), and logarithms of a firm's total assets ($Size_{it}$) and age (Age_{it}). γ_t is a set of time dummies, δ_i includes industry and region dummies, and ε_{it} is the error term. All accounting variables are winsorized at 1%. If ownership structure, short-term debt-to-asset ratio, and firm efficiency are jointly determined, OLS and random effects (RE) results would be biased. Thus, I resorted to a fixed effects (FE) estimation to control for time-unvarying endogeneity. Moreover, I used a static GMM-system estimator with an additional exogenous instrument to improve estimate consistency (Benfratello and Sembenelli 2006). Such instrument exploits the variance across provinces (NUTS 3 level) of the development of local credit markets (number of bank branches per 100,000 inhabitants; source: Bank of Italy). As highlighted by Benfratello et al. (2008), branch density is also an inverse measure of distance between firms and banks, and thus a direct measure of a firm's access to debt finance (as to Italy, see Bonaccorsi di Patti and Gobbi 2001). Moreover, the easier is the access to debt finance, the lower is

³ In sampled firms, the short-term debt/total bank debt ratio is 76.3%.

⁴ In unreported regressions, I inserted: i) the squared term of $OwnConc$ to test potential non-linear relations between ownership concentration and firm efficiency, and ii) the lagged dependent variable to control for path-dependency in a firm's efficiency. Results are in line with those shown in Section 4 and are available upon request from the author.

the necessity to use new equity capital, and thus the likelihood to change the ownership concentration – everything else being equal.

Figure 1
Ownership concentration

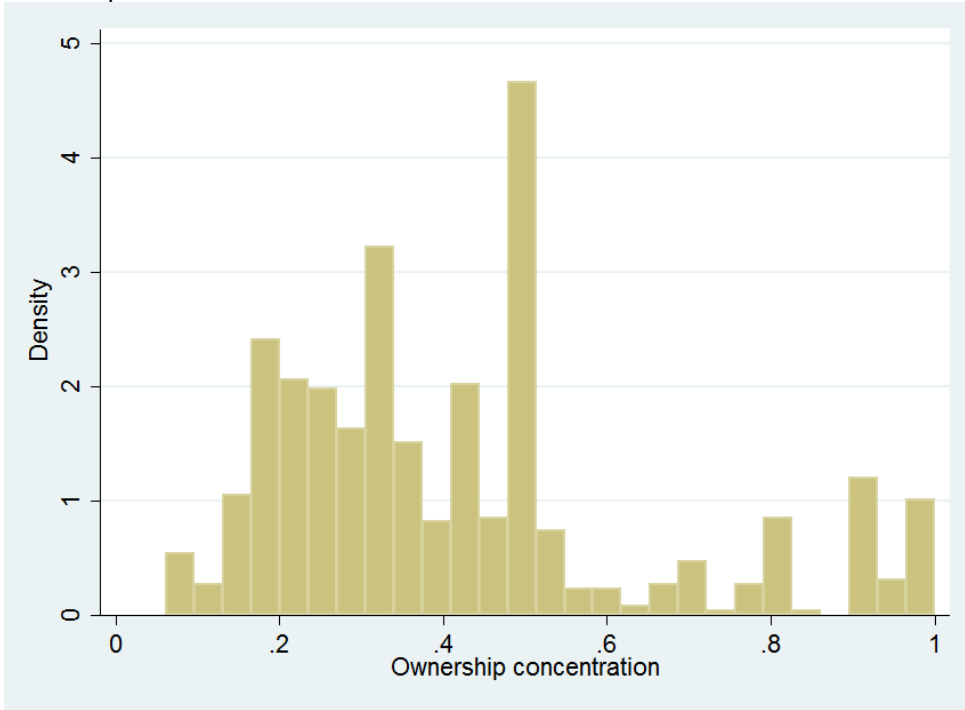
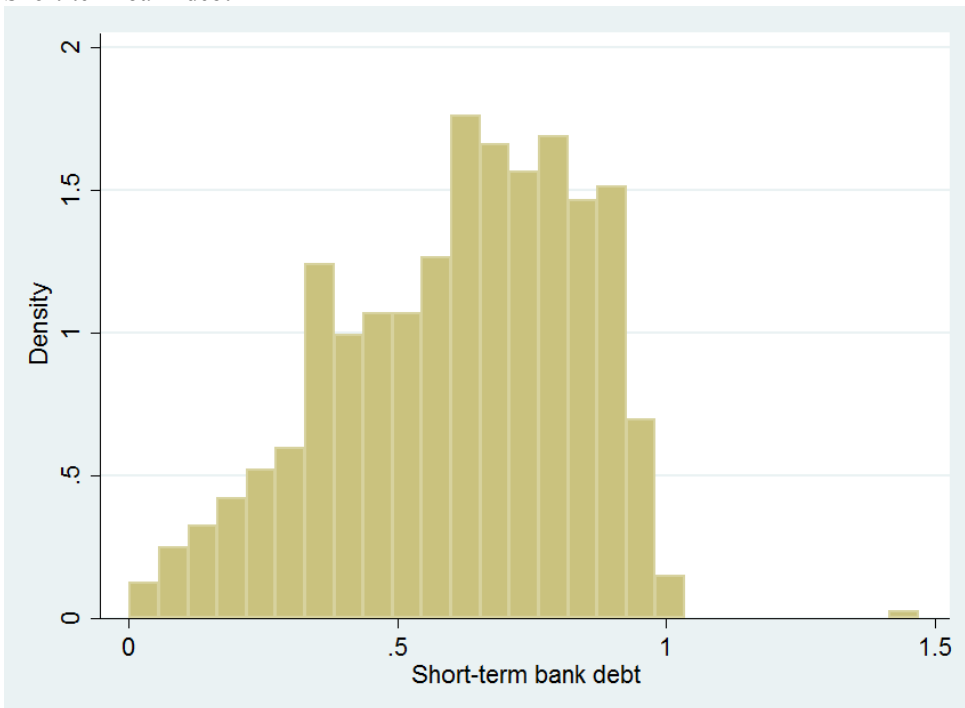


Figure 2
Short-term bank debt



4. Results and conclusions

The econometric results are shown in Table 2. OLS and RE estimates are shown for comparison purposes only. As to the control variables, I find that smaller and older firms are more efficient (for a similar evidence on the same dataset, see Colombo et al. 2011).⁵ Moreover, a higher cash-flow-to-asset ratio leads to a higher firm efficiency. As to ownership concentration, I find a positive effect on firm efficiency in FE estimation; while, this effect is negligible when controlling for time-varying endogeneity (in line with Demsetz and Villalonga 2001).

Table 2
Econometric results: short-term bank debt

	(1)	(2)	(3)	(4)
OwnConc _{it}	0.6684 ** (0.2684)	0.7099 ** (0.3286)	0.7663 ** (0.3386)	0.1213 (0.1738)
ShortDTA _{it}	0.8570 *** (0.2453)	0.9974 *** (0.3445)	1.0009 *** (0.3547)	0.4853 *** (0.1798)
OwnConc _{it} *ShortDTA _{it}	-1.0527 ** (0.4570)	-1.2354 ** (0.5509)	-1.3532 ** (0.5911)	-0.6123 * (0.3383)
CFTA _{it}	0.5624 *** (0.1955)	0.5540 *** (0.2114)	0.4684 ** (0.2139)	0.2343 * (0.1228)
Size _{it}	-0.2285 *** (0.0219)	-0.2239 *** (0.0361)	-0.2114 *** (0.0505)	-0.2375 *** (0.0335)
Age _{it}	0.0821 *** (0.0250)	0.1211 *** (0.0437)	0.1952 ** (0.0865)	0.0874 (0.0551)
Year dummies	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	No	Yes
Industry dummies	Yes	Yes	No	Yes
Constant	2.7013 *** (0.2571)	2.5307 *** (0.4689)	2.8374 *** (0.4157)	3.2704 *** (0.3123)
Obs.	741	741	741	741
Groups	134	134	134	134
R ²	0.4671	0.4417	0.3617	-
Hansen test	-	-	-	71.72[112]
AR1 test	-	-	-	-0.38
AR2 test	-	-	-	-0.82

Legend. Estimates are derived from OLS (column I), RE and FE regressions with firm-clustered standard errors (columns II and III, respectively), and GMM-SYS with finite-sample correction for the two-step covariance matrix (column IV). Moment conditions of endogenous variables start from t-3 for instruments in levels and t-2 for instruments in differences. NACE industry codes are: 29.5, 30.02, 32, 33, 35.5, 64.2, 72.2, 72.60, 73.1. Robust standard errors in round brackets. Degrees of freedom are in square brackets. * p<0.1, ** p<0.05, *** p<0.01.

In both FE and GMM regressions, I find a positive and statistically significant effect (at 1%) of short-term bank debt on firm efficiency. The associated elasticity ranges between +13.3% and +27.3% in

⁵ The average (median) values of total assets and firm age in my sample are k€ 840 (340) and 7 (6).

GMM and FE estimates respectively, both significant at 1%. When interacted with *OwnConc_{it}*, such elasticity decreases to +6.3% (significant at 10%) and +12% (significant at 5%) in GMM and FE estimations, respectively.

As was expected, the monitoring function of banks in the short-term is influenced by ownership concentration. In unlisted firms – where cash-flow rights are aligned with control rights - a higher ownership concentration reduces the efficiency-function of short-term bank debt.

In Table 3, I substituted short-term debt with long-term debt (and its interaction with ownership concentration). Both coefficients (*LongDTA_{it}* and *OwnConc_{it}*LongDTA_{it}*) are negligible, confirming that the monitoring function of bank debt depends on its maturity.

Table 3
Econometric results: long-term bank debt

	(1)		(2)		(3)		(4)	
OwnConc _{it}	-0.0409 (0.0865)		-0.0682 (0.0965)		-0.0214 (0.1252)		-0.1784 (0.1293)	
LongDTA _{it}	-0.5020 (0.2377)	**	-0.4689 (0.2512)	*	-0.2840 (0.2925)		-0.1021 (0.3021)	
OwnConc _{it} *LongDTA _{it}	0.5513 (0.3712)		0.3862 (0.3546)		0.0604 (0.4054)		0.1311 (0.4429)	
CFTA _{it}	0.2243 (0.1303)	*	0.3002 (0.1707)	*	0.3052 (0.2349)		0.2165 (0.1681)	
Size _{it}	-0.2361 (0.0192)	***	-0.2326 (0.0304)	***	-0.1703 (0.0591)	***	-0.2678 (0.0264)	***
Age _{it}	0.0821 (0.0252)	***	0.1006 (0.0322)	***	0.1748 (0.0732)	**	0.1209 (0.0504)	**
Year dummies	Yes		Yes		Yes		Yes	
Region dummies	Yes		Yes		No		Yes	
Industry dummies	Yes		Yes		No		Yes	
Constant	3.4443 (0.1469)	***	3.4942 (0.2236)	***	3.3252 (0.3267)	***	3.7737 (0.2327)	***
Obs.	741		741		741		741	
Groups	134		134		134		134	
R ²	0.5145		0.5063		0.3565		-	
Hansen test	-		-		-		78.14[112]	
AR1 test	-		-		-		-0.38	
AR2 test	-		-		-		0.30	

Legend. Estimates are derived from OLS (column I), RE and FE regressions with firm-clustered standard errors (columns II and III, respectively), and GMM-SYS with finite-sample correction for the two-step covariance matrix (column IV). Moment conditions of endogenous variables start from t-3 for instruments in levels and t-2 for instruments in differences. NACE industry codes are: 29.5, 30.02, 32, 33, 35.5, 64.2, 72.2, 72.60, 73.1. Robust standard errors in round brackets. Degrees of freedom are in square brackets. * p<0.1, ** p<0.05, *** p<0.01.

As robustness checks, I removed the most densely populated region in Italy (Lombardy) from the sample, and I substituted the country and year dummies with their cross-products. Results are almost unchanged.

This study has some limitations which are opportunities for future research. First, an enlargement of sample size would be useful to check the robustness of my results. Second, other variables may lower the monitoring of banks in the short-term, such as the ownership type or the quality of institutions. As to the latter, future studies should test whether my results hold in institutional settings with different accounting disclosure, debt enforcement, creditor rights, and national cultures.

References

- Ang, J.S., Cole, R.A., Lin, J.W. (2000) "Agency costs and ownership structure" *Journal of Finance* 55(1), 81-106.
- Benfratello, L., Schiantarelli, F., Sembenelli, A. (2008) "Banks and innovation: Microeconomic evidence on Italian firms" *Journal of Financial Economics* 90(2), 197-217.
- Benfratello, L., Sembenelli, A. (2006) "Foreign ownership and productivity: Is the direction of causality so obvious?" *International Journal of Industrial Organization* 24(4), 733-751.
- Bonaccorsi di Patti, E., Gobbi, G. (2001) "The changing structure of local credit markets: are small businesses special?" *Journal of Banking and Finance* 25, 2209–2237.
- Claessens, S., Djankov, S., Fan, J.P., Lang, L.H. (2002) "Disentangling the incentive and entrenchment effects of large shareholdings" *Journal of Finance* 57(6), 2741-2771.
- Colombo, M.G., Croce, A., Murtinu, S. (2014) "Ownership Structure, Horizontal Agency Costs and the Performance of High-Tech Entrepreneurial Firms" *Small Business Economics* 42(2), 265-282.
- Colombo, M.G., Delmastro, M., Grilli, L. (2004) "Entrepreneurs' human capital and the start-up size of new technology-based firms" *International journal of industrial organization* 22(8), 1183-1211.
- Colombo, M.G., Grilli, L. (2013) "The Creation of A Middle-Management Level by Entrepreneurial Ventures: Testing Economic Theories of Organizational Design" *Journal of Economics & Management Strategy* 22(2), 390-422.
- Colombo, M.G., Grilli, L., Murtinu, S. (2011) "R&D Subsidies and the Performance of High-Tech Start-Ups" *Economics Letters* 112(1), 97-99.
- Datta, S., Iskandar-Datta, M.A.I., Raman, K. (2005) "Managerial stock ownership and the maturity structure of corporate debt" *Journal of Finance* 60(5), 2333-2350.
- Demsetz, H., Villalonga, B. (2001) "Ownership structure and corporate performance" *Journal of corporate finance* 7(3), 209-233.
- Harvey, C.R., Lins, K.V., Roper, A.H. (2004) "The effect of capital structure when expected agency costs are extreme" *Journal of Financial Economics* 74(1), 3-30.
- Jensen, M.C. (1986) "Agency cost of free cash flow, corporate finance, and takeovers" *American Economic Review* 76(2), 323-329.
- Jensen, M.C., Meckling, W.H. (1976) "Theory of the firm: Managerial behavior, agency costs and ownership structure" *Journal of Financial Economics* 3, 305–360.
- Pagano, M., Roell, A. (1998) "The choice of stock ownership structure: agency costs, monitoring, and the decision to go public" *Quarterly journal of economics* 113(1), 187-225.
- Shleifer, A., Vishny, R.W. (1997) "A survey of corporate governance" *Journal of finance* 52(2), 737-783.