Can Family Involvement Be a Substitute for Executive Inside Debt in Lowering the Cost of Bank Loans?

Appendix 1 Variable Definitions

Variables	Definitions	Sources
Main variables		
Spread	The natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down.	DealScan
FAM	A binary variable, equal to 1 if the firm is classified as a family firm, and 0 otherwise.	Anderson et al. (2012)
CEOD1	The natural log of one plus CEO relative leverage. $CEO\ relative\ leverage = (CEOD/CEOE)/(FD/FE)$, where *CEOD* is CEO inside debt holding, including the present value of accumulated pension benefits and aggregate balance in deferred compensation. *CEOE* is CEO equity holding, consisting the value of stock and stock options. The stock value is measure by the number of stock shares times the fiscal year-end stock price. The CEO's option value is the sum of each tranche option value, which is calculated by multiplying the option value by the number of stock options. We calculate value for each option tranche based on the modified Black-Scholes model and Merton (1973). *FD* is the total debt while *FE* is the market value of equity.	
CEOD2	The natural log of one plus CEO relative incentive ratio. $CEO\ relative\ incentive\ ratio = (\Delta CEOD/\Delta CEOE)/(\Delta FD/\Delta FE)$, where $\Delta CEOD$ is equal to *CEOD*, CEO inside debt holding; $\Delta CEOE$ is CEO's total delta and measured as follows: $\Delta CEOE = S + \Sigma_i N_i(\Delta N_i)$, *S* is the number of CEO stock holding times stock delta (assumed to be 1), N_i and ΔN_i are the the number of CEO options holding and option delta per unit in each tranche. ΔFD is the total debt, while ΔFE is measured as the number of common shares outstanding times stock delta (assumed to be 1) plus the firm's total option delta, and constructed in the same way as that used for $\Delta CEOE$, except that not all data on outstanding option are available. Instead, following Core and Guay (2002), we use the total number of outstanding employee stock options (*optosey* from Coumpustat), the average exercise price of outstanding options (*optprcby* from Compustat), and assume that the average time-to-maturity is 4 years for all options.	Execucomp, CRSP, Compustat, Federal Reserve Bank of ST. Louis
CEOCFOD1	The natural log of one plus CEO and CFO relative leverage. $CEO\ and\ CFO\ relative\ leverage = (CEOCFOD/CEOCFOE)/(FD/FE)$, where *CEOCFOD* is CEO and CFO inside debt holding, including the present value of accumulated pension benefits and aggregate balance in deferred compensation. *CEOCFOE* is CEO and CFO equity holding, consisting the value of stock and stock options. The calculation of CEO and CFO relative leverage is similar to that of CEO relative leverage.	
CEOCFOD2	The natural log of one plus CEO and CFO relative incentive ratio. $CEO\ and\ CFO\ relative\ incentive\ ratio = (\Delta CEOCFOD/\Delta CEOCFOE)/(\Delta FD/\Delta FE)$, where $\Delta CEOCFOD$ is equal to *CEOCFOD*, $\Delta CEOCFOE$ is the sum of the number of CEO and CFO stock holding and the aggregate option delta. The calculation of CEO and CFO relative incentive ratio is similar to that of CEO relative incentive ratio.	
TMTD1	The natural log of one plus TMT relative leverage. $TMT\ relative\ leverage = (TMTD/TMTE)/(FD/FE)$, where *TMTD* is TMT inside debt holding, including the present value of accumulated pension benefits and aggregate balance in deferred compensation. *TMTE* is TMT equity holding, consisting the value of	

	stock and stock options. The calculation of TMT relative leverage is similar to that of CEO relative leverage.	
TMTD2	The natural log of one plus TMT relative incentive ratio. $TMT\ relative\ incentive\ ratio = (\Delta TMTD / \Delta TMTE)/(\Delta FD / \Delta FE)$, where $\Delta TMTD$ is equal to $TMTD$, $\Delta TMTE$ is the sum of the number of TMT stock holding and product of the number of TMT stock options and the aggregate option delta. The calculation of TMT relative incentive ratio is similar to that of CEO relative incentive ratio.	

Control variables		
FirmSize	The natural log of one plus the firm's total assets.	Compustat
ROA	Return on assets is the ratio of income before extraordinary items to total assets.	Compustat
Leverage	The ratio of total debt to total assets.	Compustat
MTB	The market value of assets divided by total assets, where the market value of assets is measured as (the market value of equity + preferred Stock value + debt in current liabilities + long-term debt − deferred taxes and Investment tax credit).	Compustat
SDofCF	Standard deviation of net operating cash flows over the past four years.	Compustat
LiqCon	Liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise.	Compustat
Tenure	The natural log of one plus CEO's tenure in months.	Execucomp
LoanSize	The natural log of one plus the loan's amount.	DealScan
Maturity	The natural log of one plus the maturity of the loan in months.	DealScan
NLender	The natural log of one plus the number of lenders involving in a loan.	DealScan
Security	A binary variable, equal to 1 if the loan has collateral and 0 otherwise.	DealScan

Instrumental Variables		
TWage TMortgage TGain	Maximum state tax rate for wages, mortgage subsidy, and long-term capital gains.	National Bureau of Economic Research

This table reports the definitions of all the variables used in the paper. All the continuous variables are winsorized at the 1% level.