Economic Significance in Corporate Finance: Todd Mitton (2020)

Discussant: Adarsh Kuthuru
Carroll School of Management, Boston College

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Overview

- Summary of the paper
- Comments
- Conclusion

Summary of the paper

Research Question:
- Issues with the reporting economic significance in empirical corporate finance literature and how to address them?

Findings:

The author studies 604 articles published in the top three finance journals between 2000 and 2018 that report 954 regressions.

- He studies different measures of economic significance - $E_{\bar{y}}^{S}, E_{\bar{y}}^{IQR}, E_{S}^{S}, E_{S}^{IQR}$ by regressing the common outcome variables in corporate finance like profitability, firm value, leverage, investment, payouts, or cash holdings on randomly generated explanatory variables and finds that $E_{\bar{y}}^{S}, E_{\bar{y}}^{IQR}$ are not reliable despite using control variables.

Results

Table 4

Measures of economic significance for randomly generated explanatory variables

The table reports summary statistics of measures of economic significance of randomly generated explanatory variables. Definitions of the measures of economic significance are given in Section 2.2.1. Panel A reports results for normally distributed explanatory variables for each of the six categories of regressions, and Panel B reports results for dummy explanatory variables for all six categories combined. For each category of dependent variable and type of explanatory variable, one hundred randomly generated explanatory variables are tested, and each randomly generated explanatory variable is tested with all possible combinations of six binary methodological decisions, or 64 regressions for each of 100 explanatory variables. So Panel A reports statistics for 6,400 regressions in each row and Panel B reports statistics for 38,400 regressions in each row. All data other than the randomly generated explanatory variables come from the Compustat database for the years 1963 to 2018. Each regression includes year fixed effects and either industry fixed effects (two-digit SIC) or firm fixed effects, as indicated.

Category of dependent variable	Economic significance measure	Industry fixed effects							Firm fixed effects						
		Min	10th pctile	25th pctile	Median	75th pctile	90th pctile	Max	Min	10th pctile	25th pctile	Median	75th pctile	90th pctile	Max
		Panel A: Randomly generated normally distributed explanatory variables													
Profitability	E_β^s	0.00	0.00	0.01	0.03	0.12	0.23	0.74	0.00	0.00	0.01	0.02	0.08	0.19	0.66
	E_β^{IQR}	0.00	0.00	0.01	0.04	0.16	0.31	1.00	0.00	0.00	0.01	0.03	0.11	0.26	0.89
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Value	E_β^s	0.00	0.00	0.00	0.00	0.06	0.20	1.59	0.00	0.00	0.00	0.00	0.03	0.07	0.46
	E_β^{IQR}	0.00	0.00	0.00	0.01	0.08	0.27	2.13	0.00	0.00	0.00	0.01	0.04	0.10	0.62
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Leverage	E_β^s	0.00	0.00	0.00	0.00	0.00	0.05	0.18	0.00	0.00	0.00	0.00	0.00	0.05	0.18
	E_β^{IQR}	0.00	0.00	0.00	0.00	0.01	0.06	0.24	0.00	0.00	0.00	0.00	0.00	0.06	0.25
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Investment	E_β^s	0.00	0.00	0.00	0.00	0.02	0.11	0.48	0.00	0.00	0.00	0.00	0.02	0.12	0.49
	E_β^{IQR}	0.00	0.00	0.00	0.00	0.03	0.15	0.64	0.00	0.00	0.00	0.00	0.03	0.16	0.67
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Payout	E_β^s	0.00	0.00	0.00	0.01	0.09	0.23	0.83	0.00	0.00	0.00	0.01	0.08	0.24	1.33
	E_β^{IQR}	0.00	0.00	0.00	0.01	0.12	0.31	1.12	0.00	0.00	0.00	0.01	0.11	0.32	1.79
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Cash	E_β^s	0.00	0.00	0.00	0.00	0.01	0.07	0.83	0.00	0.00	0.00	0.00	0.01	0.06	0.58
	E_β^{IQR}	0.00	0.00	0.00	0.00	0.01	0.09	1.12	0.00	0.00	0.00	0.00	0.01	0.08	0.78
	E_t^s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	E_t^{IQR}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
		Panel B: Randomly generated dummy explanatory variables													
ALL	E_β^s	0.00	0.00	0.00	0.00	0.13	0.39	10.77	0.00	0.00	0.00	0.01	0.08	0.30	8.19
	E_t^s	0.00	0.00	0.00	0.00	0.01	0.01	0.08	0.00	0.00	0.00	0.00	0.01	0.07	

Results

Table 6

Economic significance of commonly used control variables

The table reports measures of economic significance for commonly used control variables in regressions of the categories shown. Control variables used more than 25% of the time in the literature are reported, based on a survey of 954 regressions reported in the top three finance journals from 2000 to 2018. The most common proxy for the dependent variable is also determined by the literature survey. For each category, one regression is performed with all listed control variables as explanatory variables. All regressions include year fixed effects and either industry fixed effects (2-digit SIC) or firm fixed effects, as noted. Data come from the Compustat database for the years 1963 to 2018. Definitions of the measures of economic significance are given in Section 2.2.1. Definitions of dependent variables and control variables are given in Appendix Table A1.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Industry FE		Firm FE	
Category	Most common proxy for dependent variable	Most common control variables	Usage rate in literature	E_z^z	E_y^z	E_z^z	E_y^z
Profitability	Return on assets	Firm size	81%	0.27	3.69	0.44	6.07
		Leverage	38%	0.21	2.86	0.19	2.60
		Value	33%	0.51	6.95	0.38	5.12
Value	Tobin's q	Firm size	84%	0.09	0.20	0.40	0.84
		Investment	55%	0.03	0.06	0.03	0.06
		Leverage	53%	0.15	0.33	0.16	0.33
		Profitability	50%	0.60	1.27	0.44	0.94
Leverage	Total debt/Total assets	Firm size	87%	0.06	0.08	0.07	0.10
		Profitability	73%	0.33	0.44	0.28	0.37
		Value	65%	0.23	0.31	0.21	0.28
		Asset tangibility	52%	0.20	0.27	0.19	0.25
		Investment	25%	0.07	0.09	0.05	0.07
Investment	CAPX/Total assets	Firm size	64%	0.03	0.04	0.10	0.13
		Value	58%	0.05	0.06	0.05	0.06
		Profitability	58%	0.01	0.01	0.04	0.04
		Leverage	34%	0.00	0.00	0.03	0.03
Payouts	Dividends/Total assets	Firm size	80%	0.16	0.35	0.03	0.07
		Profitability	66%	0.16	0.35	0.05	0.12
		Value	53%	0.20	0.44	0.07	0.15
		Leverage	44%	0.10	0.22	0.06	0.13
Cash	Cash/Total assets	Firm size	81%	0.20	0.26	0.28	0.37
		Profitability	65%	0.08	0.11	0.02	0.03
		Value	51%	0.16	0.22	0.14	0.18
		Leverage	47%	0.31	0.42	0.18	0.24
		Investment	40%	0.10	0.13	0.08	0.11
		Payouts	33%	0.00	0.00	0.04	0.06

Comments

- Claim-1: Economic significance is stated as an absolute value even though it is necessarily a relative concept.
- Claim-2: Lack of standardization in the measurement of economic significance in the literature and susceptibility to spurious inflation.
- β explains 1% variation in X $\to \beta$% variation in Y
  $\implies S_X$% variation in X $\to \beta S_X$% variation in Y
  $\implies$ 1 std dev. change in X $\to \left| \frac{\beta S_X}{S_Y} \right|$ std dev. change in Y
  $\implies E_S^S$ measure is correct and others based on mean are unreliable

Comments

- Claim-3: Lack of benchmarks to compare the measure of economic significance.
- Q: What is the need to compare economic significance? If X1 explains Y and X2 explains Y (X1 and X2 are disjoint), does the author wants us to eliminate one of them and focus on the other?
- Otherwise, include both X1 and X2 in the regression. Even if correlated, find an instrument to eliminate endogeneity issues.
- Author suggests we use standard control variables. But they need not be correlated with both X1 and X2. So what is the need for these?

Conclusion

- Interesting paper pointing out the deficiencies in reporting patterns in Empirical Corporate Finance research
- I strongly recommend reading this paper.