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The effect of macroeconomic conditions on the capital structure adjustment speed of South African listed firms

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APPENDIX C: RESULTS FROM REGRESSIONS WITH ALTERNATIVE DEFINITIONS OF MACROECONOMIC CONDITIONS (CHANGES IN LAGS)

Table I: Regression results from full sample

	Total leverage			**Long-term Leverage**			**Short-term leverage**		
	Upturn	Downturn	Difference	Upturn	Downturn	Difference	Upturn	Downturn	Difference
Panel A: Regression results when macroeconomic conditions are determined by the term spread									
TERM_U*TGT	0.5601538 (0.1212) (0.000)			0.6060417 (0.0791) (0.000)			0.4325466 (0.1818) (0.017)		
TERM_D*TGT		0.5001371 (0.1303) (0.000)			0.5970582 (0.0804) (0.000)			0.3090925 (0.1857) (0.096)	
			8.05(0.0046)			0.13(0.7174)			12.92(0.0003)
Number of observations	1031			1031			1031		
1st order autocorrelation	-2.1483 (0.0317)			-3.2621 (0.0011)			-1.7629 (0.0779)		
2nd order autocorrelation	1.4656 (0.1428)			1.3026 (0.1927)			1.3445 (0.1788)		
Sargan test	64.8821 (0.1082)			67.0861 (0.0777)			62.5979 (0.1491)		
Wald	1217.38 (0.0000)			4131.40 (0.0000)			653.67 (0.0000)		
Panel B: Regression results when macroeconomic conditions are determined by the leading indicator									
LEAD_U*TGT	0.4135948 (0.1375) (0.003)			0.3892109 (0.0791) (0.000)			0.4393067 (0.1724) (0.011)		
LEAD_D*TGT		0 .3824402 (0.1443) (0.008)			0.3087809 (0.0841) (0.000)			0.4313531 (0.1687) (0.011)	
			4.29(0.0384)			22.46(0.0000)			0.10(0.7543)
Number of observations	1031			1031			1031		

1st order autocorrelation	-2.0749 (0.0380)	-3.2841 (0.0010)	-1.7517 (0.0798)
2nd order autocorrelation	1.4337 (0.1517)	1.3397 (0.1803)	1.3337 (0.1823)
Sargan test	73.2800 (0.1275)	63.7549 (0.1271)	62.54836 (0.1501)
Wald	891.95 (0.0000)	3858.06 (0.0000)	576.41 (0.0000)
Panel C: Regression results when macroeconomic conditions are determined by the lagging indicator			
LAG_U*TGT	-0.0384594 (0.1850) (0.835)	0.0972292 (0.1124) (0.387)	0 .7194778 (0.1893) (0.000)
LAG_D*TGT	-.0298018 (0.1838) (0.871)	0.1319463 (0.1068) (0.217)	0.7198161 (0.1921) (0.000)
	0.13 (0.7219)	1.80(0.1792)	0.00 (0.9914)
Number of observations	849	849	849
1st order autocorrelation	-1.9941 (0.0461)	-2.8666 (0.0041)	-1.654 (0.0981)
2nd order autocorrelation	1.4775 (0.1395)	1.4384 (0.1503)	1.1737 (0.2405)
Sargan test	45.3863 (0.0917)	38.34781 (0.2788)	48.2655 (0.0534)
Wald	493.15 (0.0000)	2267.58 (0.0000)	145.43 (0.0000)

This table reports regression results from the full sample when the lags were changed on certain macroeconomic variables (resulting in changed definitions of macroeconomic states). Regressions were run separately for each macroeconomic indicator. Panels A to C show the results using the various indicators. For the sake of brevity, the firm-characteristic variables are excluded from the results. Instead, the coefficients for the interaction terms between the macroeconomic indicator dummy variables and target leverage are reported. The variables are defined as follows: TERM_U*TGT is the interaction of the upturn term spread dummy with the target leverage term, TERM_D*TGT is the interaction of the downturn term spread dummy with the target leverage term, LEAD_U*TGT is the interaction between the upturn leading indicator dummy and the target leverage term, LEAD_D*TGT is the interaction between the downturn leading indicator dummy and the target leverage term, LAG_U*TGT s the interaction between the upturn lagging indicator dummy and the target leverage term, and LAG_D*TGT is the interaction between the downturn lagging indicator dummy and the target leverage variable. The coefficients on the interaction terms yield the speed of adjustment estimates in upturns (in the case of the upturn interaction terms) and downturns (in the case of the downturn interaction terms). The GMM standard errors and p-values for the adjustment speed coefficients are reported (in this order) below the coefficients. The "difference" column reports the chi-squared statistic and p-value in brackets from a difference in means test between the coefficients on the interaction

terms. This significance of the chi-squared statistic determines whether the null hypothesis of no difference in the coefficients should be accepted or rejected. In addition, the number of observations in each regression is reported. The first and second-order autocorrelation test z-statistics are also reported. The p-values for these are reported in brackets, the significance of which determines whether or not to reject the null hypothesis of no autocorrelation. Sargan test chi-squared statistics are also reported, with p-values reported in brackets, in order to test the null hypothesis that the overidentifying restrictions are valid. Wald test chi-squared statistics are also included. The p-values (reported in brackets) related to this determines whether the null hypothesis that all the dependent variables are simultaneously equal to 0 (and therefore are not significant determinants of the dependent variable and can be excluded from the model) should be rejected. Lastly, separate columns are included for each leverage definition as separate sets of regressions were run for short-term, long-term and total leverage.

Table II: Regression results for constrained and unconstrained firms as defined by the capital expenditure coverage ratio

	Total leverage			**Long-term Leverage**			**Short-term leverage**		
	Upturn	Downturn	Difference	Upturn	Downturn	Difference	Upturn	Downturn	Difference
Panel A: Regression results when macroeconomic conditions are determined by the term spread									
Unconstrained									
TERM_U*TGT	0.6381355 (0.0278) (0.000)			0.5936762 (0.0160) (0.000)			1.263968 (0.0305) (0.000)		
TERM_D*TGT		0.6079504 (0.0272) (0.000)			0.5321077 (0.0150) (0.000)			1.403601 (0.0294) (0.000)	
			386.27(0.0000)			2149.72(0.0000)			1237.82(0.0000)
Number of observations	354			354			354		
1st order autocorrelation	-3.0701 (0.0021)			-1.9836 (0.0473)			-2.4841 (0.0130)		
2nd order autocorrelation	1.3165 (0.1880)			1.0662 (0.2863)			1.0965 (0.2728)		
Sargan test	47.3973 (0.6552)			60.7574 (0.1896)			54.6266 (0.3750)		
Wald	3.24e+06 (0.0000)			1.72e+07 (0.0000)			7.76e+07 (0.0000)		
Constrained									
TERM_U*TGT	-0.1355214 (0.0221) (0.000)			-0.9591872 (0.0269) (0.000)			1.99941 (0.0439) (0.000)		
TERM_D*TGT		-0.1163674 (0.0219) (0.000)			-0.8563904 (0.0974) (0.000)			1.897848 (0.0479) (0.000)	
			45.46 (0.0000)			16258.36(0.0000)			215.43 (0.0000)
Number of observations	279			279			279		
1st order autocorrelation	-1.9221 (0.0546)			-2.3462 (0.0190)			-1.7859 (0.0741)		
2nd order	1.2763			0.5962			-0.1004		

autocorrelation	(0.2018)			(0.5510)			(0.9200)	
Sargan test	46.7268 (0.6807)			53.1741 (0.4287)			55.6513 (0.3391)	
Wald	84430.83 (0.0000)			1.17e+07 (0.0000)			5.47e+06 (0.0000)	
Panel B: Regression results when macroeconomic conditions are determined by the leading indicator								
Unconstrained								
LEAD_U*TGT	0 .6285084 (0.0310) (0.000)			0.5453432 (0.0097) (0.000)			1.314915 (0.0299) (0.000)	
LEAD_D*TGT		0.6256152 (0.0319) (0.000)			0.5407646 (0.0092) (0.000)			1.180522 (0.0342) (0.000)
			2.31 (0.1283)			5.64(0.0175)		525.75(0.0000)
Number of observations	354			354			354	
1st order autocorrelation	-3.0577 (0.0022)			-2.0348 (0.0419)			-2.4682 (0.0136)	
2nd order autocorrelation	1.2501 (0.2113)			1.0626 (0.2880)			1.2682 (0.2047)	
Sargan test	45.9472 (0.7096)			62.9894 (0.1414)			52.8432 (0.4413)	
Wald	1.31e+06 (0.0000)			2.00e+07 (0.0000)			1.33e+07 (0.0000)	
Constrained								
LEAD_U*TGT	-0.5015632 (0.0218) (0.000)			-1.199069 (0.0186) (0.000)			2.333356 (0.0634) (0.000)	
LEAD_D*TGT		-.6062877 (0.0211) (0.000)			-1.437119 (0.0214) (0.000)			2.145791 (0.0627) (0.000)
			505.94(0.0000)			3616.04(0.0000)		488.53 (0.0000)
Number of observations	279			279			279	
1st order autocorrelation	-1.8543 (0.0637)			-2.3484 (0.0189)			-1.8895 (0.0588)	

2nd order autocorrelation	1.1564 (0.2475)			0.4812 (0.6304)			-0.1553 (0.8766)	
Sargan test	44.9790 (0.7441)			50.7152 (0.5245)			55.5421 (0.3428)	
Wald	48809.12 (0.0000)			7.79e+07 (0.0000)			265838.36 (0.0000)	
Panel C: Regression results when macroeconomic conditions are determined by the lagging indicator								
Unconstrained								
LAG_U*TGT	0.4572512 (0.1095) (0.000)			0.3373062 (0.0693) (0.000)			0.7414798 (0.1789) (0.000)	
LAG_D*TGT		0.3782019 (0.1075) (0.000)			0.3030316 (0.0661) (0.000)			0.7004271 (0.1896) (0.000)
			53.19 (0.0000)			47.49(0.0000)		1.83(0.1764)
Number of observations	292			292			292	
1st order autocorrelation	-3.1275 (0.0018)			-1.9336 (0.0532)			-2.392 (0.0168)	
2nd order autocorrelation	0.91672 (0.3593)			1.0284 (0.3038)			0.8817 (0.3779)	
Sargan test	39.41154 (0.2406)			38.8882 (0.2590)			39.5822 (0.2348)	
Wald	4355.85 (0.0000)			7998.02 (0.0000)			451.83 (0.0000)	
Constrained								
LAG_U*TGT	0 .1510215 (0.0598) (0.012)			-0.5630392 (0.0544) (0.000)			0.0106835 (0.0974) (0.913)	
LAG_D*TGT		0.0824523 (0.0583) (0.157)			-0.5810159 (0.0568) (0.000)			0.0655349 (0.0937) (0.484)
			84.20(0.0000)			24.23 (0.0000)		33.72(0.0000)
Number of observations	239			239			239	
1st order autocorrelation	-2.3398 (0.0193)			-2.1093 (0.0349)			-1.7697 (0.0768)	

2nd order autocorrelation	1.2673 (0.2051)	0.9814 (0.3264)	0 .7506 (0.4529)
Sargan test	35.2969 (0.4067)	39.8552 (0.2258)	40.2272 (0.2138)
Wald	244448.43 (0.0000)	79974.11 (0.0000)	31438.21 (0.0000)

This table reports regression results for constrained and unconstrained samples as defined by the capital expenditure coverage ratio when the lags were changed on certain macroeconomic variables (resulting in changed definitions of macroeconomic states). Regressions were run separately for each macroeconomic indicator. Panels A to C show the results using the various indicators. For the sake of brevity, the firm-characteristic variables are excluded from the results. Instead, the coefficients for the interaction terms between the macroeconomic indicator dummy variables and target leverage are reported. The variables are defined as follows: TERM_U*TGT is the interaction of the upturn term spread dummy with the target leverage term, TERM_D*TGT is the interaction of the downturn term spread dummy with the target leverage term, LEAD_U*TGT is the interaction between the upturn leading indicator dummy and the target leverage term, LEAD_D*TGT is the interaction between the downturn leading indicator dummy and the target leverage term, LAG_U*TGT s the interaction between the upturn lagging indicator dummy and the target leverage term, and LAG_D*TGT is the interaction between the downturn lagging indicator dummy and the target leverage variable. The coefficients on the interaction terms yield the speed of adjustment estimates in upturns (in the case of the upturn interaction terms) and downturns (in the case of the downturn interaction terms). The GMM standard errors and p-values for the adjustment speed coefficients are reported (in this order) below the coefficients. The "difference" column reports the chi-squared statistic and p-value in brackets from a difference in means test between the coefficients on the interaction terms. This significance of the chi-squared statistic determines whether the null hypothesis of no difference in the coefficients should be accepted or rejected. In addition, the number of observations in each regression is reported. The first and second-order autocorrelation test z-statistics are also reported. The p-values for these are reported in brackets, the significance of which determines whether or not to reject the null hypothesis of no autocorrelation. Sargan test chi-squared statistics are also reported, with p-values reported in brackets, in order to test the null hypothesis that the overidentifying restrictions are valid. Wald test chi-squared statistics are also included. The p-values (reported in brackets) related to this determines whether the null hypothesis that all the dependent variables are simultaneously equal to 0 (and therefore are not significant determinants of the dependent variable and can be excluded from the model) should be rejected. Lastly, separate columns are included for each leverage definition as separate sets of regressions were run for short-term, long-term and total leverage.

Table III: Regression results for constrained and unconstrained firms as defined by the debt coverage ratio

	Total leverage			**Long-term Leverage**			**Short-term leverage**		
	Upturn	Downturn	Difference	Upturn	Downturn	Difference	Upturn	Downturn	Difference
Panel A: Regression results when macroeconomic conditions are determined by the term spread									
Unconstrained									
TERM_U*TGT	-0.1741503 (0.0161) (0.000)			-0.0669629 (0.0050) (0.000)			-0.0238083 (0.0277) (0.391)		
TERM_D*TGT		-0.1446886 (0.0150) (0.000)			-0.0723745 (0.0050) (0.000)			0.0833249 (0.0332) (0.012)	
			64.85(0.0000)			113.08 (0.0000)			107.58(0.0000)
Number of observations	185			185			185		
1st order autocorrelation	-1.9409 (0.0523)			-2.671 (0.0076)			-1.5415 (0.1232)		
2nd order autocorrelation	1.0993 (0.2716)			-0.2893 (0.7723)			-0.0161 (0.9872)		
Sargan test	34.1999 (0.9732)			34.3852 (0.9717)			37.1228 (0.9406)		
Wald	4.62e+06 (0.0000)			2.61e+07 (0.0000)			596604.23 (0.0000)		
Constrained									
TERM_U*TGT	1.04301 (0.1346) (0.000)			0.3258239 (0.0972) (0.001)			0 .8925918 (0.1713) (0.000)		
TERM_D*TGT		0.9946915 (0.1387) (0.000)			0.2621226 (0.1022) (0.010)			0.7744308 (0.1687) (0.000)	
			6.99 (0.0082)			8.01(0.0046)			11.38 (0.0007)
Number of observations	617			617			617		
1st order autocorrelation	-2.6831 (0.0073)			-2.5005 (0.0124)			-3.1035 (0.0019)		
2nd order	1.2274			1.2532			1.6875		

autocorrelation	(0.2197)			(0.2101)			(0.0915)	
Sargan test	50.4299 (0.5358)			60.4788 (0.1964)			51.1546 (0.5071)	
Wald	1564.25 (0.0000)			10662.25 (0.0000)			610.12 (0.0000)	
Panel B: Regression results when macroeconomic conditions are determined by the leading indicator								
Unconstrained								
LEAD_U*TGT	-0.2253625 (0.0244) (0.000)			-0.0388068 (0.0049) (0.000)			-0.0475826 (0.0424) (0.262)	
LEAD_D*TGT		-0.2515509 (0.0266) (0.000)			-0.0175626 (0.0060) (0.004)			-0.1307546 (0.0394) (0.001)
		73.84 (0.0000)			314.65 (0.0000)			189.80(0.0000)
Number of observations	185			185			185	
1st order autocorrelation	-1.9081 (0.0564)			-2.5534 (0.0107)			-1.5393 (0.1237)	
2nd order autocorrelation	1.0986 (0.2719)			0 .0295 (0.9765)			0.1712 (0.8641)	
Sargan test	37.6467 (0.9326)			34.8121 (0.9679)			38.2155 (0.9232)	
Wald	51477.37 (0.0000)			1.10e+07 (0.0000)			1.60e+07 (0.0000)	
Constrained								
LEAD_U*TGT	0 .7449288 (0.1411) (0.000)			-0.1073278 (0.1081) (0.321)			1.150553 (0.1746) (0.000)	
LEAD_D*TGT		0.6701233 (0.1480) (0.000)			-0.2995113 (0.1107) (0.007)			1.029423 (0.1672) (0.000)
		26.70 (0.0000)			136.80 (0.0000)			14.21(0.0002)
Number of observations	617			617			617	
1st order autocorrelation	-2.6508 (0.0080)			-2.5084 (0.0121)			-3.1892 (0.0014)	

2nd order autocorrelation	1.3056 (0.1917)			1.3215 (0.1863)			1.6929 (0.0905)	
Sargan test	52.9212 (0.4384)			65.5894 (0.0976)			56.4671 (0.3117)	
Wald	1595.38 (0.0000)			10439.08 (0.0000)			620.11 (0.0000)	
Panel C: Regression results when macroeconomic conditions are determined by the lagging indicator								
Unconstrained								
LAG_U*TGT	-0.251764 (0.0506) (0.000)			-0.1482624 (0.0670) (0.000)			-0.4926125 (0.0431) (0.000)	
LAG_D*TGT		-0.2144847 (0.0475) (0.000)			-0.158304 (0.0202) (0.000)			-0.4335685 (0.0379) (0.000)
			28.77(0.0000)			1.85(0.1739)		35.75(0.0000)
Number of observations	162			162			162	
1st order autocorrelation	-1.6084 (0.1077)			-2.2911 (0.0220)			-1.4783 (0.1393)	
2nd order autocorrelation	1.1298 (0.2586)			1.4332 (0.1518)			0.7153 (0.4744)	
Sargan test	25.0680 (0.8671)			25.5539 (0.8511)			30.8582 (0.6224)	
Wald	29268.37 (0.0000)			171488.49 (0.0000)			11380.62 (0.0000)	
Constrained								
LAG_U*TGT	0.8862608 (0.1921) (0.000)			0.2956005 (0.1141) (0.010)			0.6225789 (0.2069) (0.003)	
LAG_D*TGT		0.9186314 (0.1838) (0.000)			0.3084498 (0.1098) (0.005)			0.6967676 (0.2136) (0.001)
			1.25(0.2639)			0.24 (0.6278)		2.82 (0.0929)
Number of observations	506			506			506	
1st order autocorrelation	-2.4775 (0.0132)			-2.2658 (0.0235)			-3.0284 (0.0025)	

2nd order autocorrelation	1.0873 (0.2769)	1.4463 (0.1481)	1.0973 (0.2725)
Sargan test	32.0848 (0.5618)	44.2642 (0.1118)	45.9382 (0.0830)
Wald	1833.94 (0.0000)	7576.76 (0.0000)	246.06 (0.0000)

This table reports regression results for constrained and unconstrained samples as defined by the debt coverage ratio when the lags were changed on certain macroeconomic variables (resulting in changed definitions of macroeconomic states). Regressions were run separately for each macroeconomic indicator. Panels A to C show the results using the various indicators. For the sake of brevity, the firm-characteristic variables are excluded from the results. Instead, the coefficients for the interaction terms between the macroeconomic indicator dummy variables and target leverage are reported. The variables are defined as follows: TERM_U*TGT is the interaction of the upturn term spread dummy with the target leverage term, TERM_D*TGT is the interaction of the downturn term spread dummy with the target leverage term, LEAD_U*TGT is the interaction between the upturn leading indicator dummy and the target leverage term, LEAD_D*TGT is the interaction between the downturn leading indicator dummy and the target leverage term, LAG_U*TGT s the interaction between the upturn lagging indicator dummy and the target leverage term, and LAG_D*TGT is the interaction between the downturn lagging indicator dummy and the target leverage variable. The coefficients on the interaction terms yield the speed of adjustment estimates in upturns (in the case of the upturn interaction terms) and downturns (in the case of the downturn interaction terms). The GMM standard errors and p-values for the adjustment speed coefficients are reported (in this order) below the coefficients. The "difference" column reports the chi-squared statistic and p-value in brackets from a difference in means test between the coefficients on the interaction terms. This significance of the chi-squared statistic determines whether the null hypothesis of no difference in the coefficients should be accepted or rejected. In addition, the number of observations in each regression is reported. The first and second-order autocorrelation test z-statistics are also reported. The p-values for these are reported in brackets, the significance of which determines whether or not to reject the null hypothesis of no autocorrelation. Sargan test chi-squared statistics are also reported, with p-values reported in brackets, in order to test the null hypothesis that the overidentifying restrictions are valid. Wald test chi-squared statistics are also included. The p-values (reported in brackets) related to this determines whether the null hypothesis that all the dependent variables are simultaneously equal to 0 (and therefore are not significant determinants of the dependent variable and can be excluded from the model) should be rejected. Lastly, separate columns are included for each leverage definition as separate sets of regressions were run for short-term, long-term and total leverage.