Online Appendix to "Asset Tangibility, Corporate Decisions, and Cash Flow Shocks: Evidence from the REIT Modernization Act"

In this appendix, I replicate my analysis, using an alternative control group – manufacturing firms, to test the tangibility hypothesis. Manufacturing firms remain the most studied firms in corporate finance literature, and, therefore, using those firms as control group provides a nice benchmark for comparison. Almeida and Campello (2007) also test the tangibility hypothesis with a sample of manufacturing firms. REITs are identified as in section 5.1. Manufacturing firms are identified as the firms with SIC codes between 1999 and 4000. For consistency, only dividend-paying manufacturing firm-years are considered, since REITs are stipulated to pay dividends.

Empirical Tests

Summary Statistics

Figure A1 plots the mean investment for REITs and manufacturing firms. As before, mean investment of REITs remains more or less unchanged for the entire sample period. On the other hand, mean investment of manufacturing firms shows steady but a downward trend until 2000 but the investment started declining 2000 onwards. In particular, mean investment of REITs remains unchanged around the RMA, while the mean investment of manufacturing firms starts falling following the RMA. Since the RMA affected only REITs and not manufacturing firms, the change in the mean investment of manufacturing firms staring 2000 is not due to the RMA. Increase in internal funds due to the RMA does not seem to affect REIT investment, which is fully consistent with the tangibility hypothesis.

Table A1 presents the descriptive statistics of the variables in the sample. Most descriptive statistics exhibit a similar pattern as in Table 2 in section 5.2. The mean size of the manufacturing firms is similar to that of REITs. The mean tangibility of the manufacturing firms, at nearly 0.30, continues to remain significantly lower than that of

REITs, at 0.76. On the other hand, the mean market-to-book ratio of REITs, at 1.05, is slightly lower than that of the manufacturing firms, at nearly 1.5. Finally, a slightly larger proportion of manufacturing firms has a credit rating.

Increase in Internal Funds

The specification remains as in section 6.1. The results are reported in Panel A of Table A2, where the dependent variable, dividend payout, is scaled by total assets. DID is consistently negative and statistically significant across the columns, which implies that REITs reduced their dividend payout in response to the lowered dividend distribution requirement, allowed by the RMA. In panel B of Table A2, the dependent variable, dividend payout, is scaled by sales. The results remain quite similar to those in panel B of Table 3.

Asset Tangibility and Investment

The specifications for investment remain as in section 6.2. Table A3 presents the regression results for equations 2 and 3. The pattern of the results remains similar, which implies that REITs' investment did not change in response to the lowered dividend distribution requirement, triggered by the RMA. Hence, with manufacturing firms as control group, the results continue to support tangibility hypothesis (H1).

Asset Tangibility and Financing Decisions

The specifications for debt issuance, equity issuance, and financial leverage remain the same as in section 6.3. Tables A4, A5, and A6 report the results for debt issuance, equity issuance, and financial leverage, respectively. The effect on debt issuance continues to remain statistically negative in Table A4, which is consistent with the tangibility hypothesis. As previously, the effect on equity issuance also remains negative in Table

A5 In Table A6, the effect on leverage continues to be negative and significant. Thus, the results continue to support the tangibility hypothesis (H2).

Asset Tangibility and Liquidity Demand

The specification for the cash flow sensitivity of cash follows equation 5 in section 6.5. The variable of interest is DID*Cashflow. Table A7 reports the results and shows that DID*Cashflow remains statistically insignificant across the columns. Therefore, REITs' liquidity demand remained unchanged following the RMA, which supports the tangibility hypothesis (H3).

Conclusion

In this appendix, the results continue to remain robust with an alternative control group, manufacturing firms, which suggests that the choice of control group is robust to out-of-sample validity concern.

References

Heitor Almeida and Murillo Campello. Financial constraints, asset tangibility, and corporate investment. *Review of Financial Studies*, 20(5):1429–1460, 2007.

Figure A1: REITs' Investment and the RMA
Investment is measured as the ratio of capital expenditure and beginning-of-year total assets on the vertical axis, and the years are depicted on the horizontal axis.

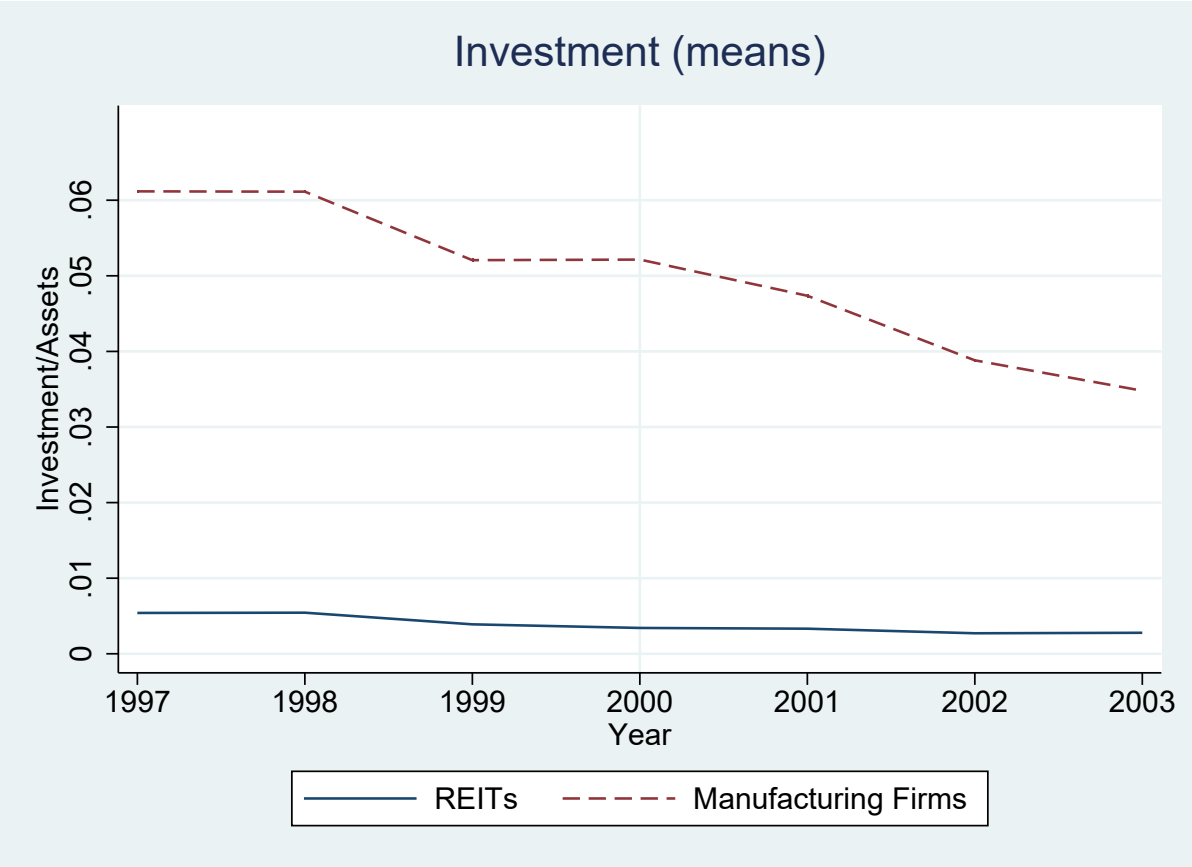

Table A1: Summary statistics

The sample is for US REITs and manufacturing firms. Size is defined as the natural logarithm of total assets. Age is defined based on Ritter's founding-year data, or else the first appearance on CRSP. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to total assets. Div/Assets is defined as dividend payout to beginning-of-year total assets. Div/Sale is defined as dividend payout to beginning-of-year sale. Investment is defined as the ratio of capital expenditure to beginning-of-year total assets. Tangibility (Tang): For REITs, it is defined as the ratio of value of their property to beginning-of-year total assets, and for non-REITs, it is defined as the ratio of net property, plant, and equipment to beginning-of-year total assets. Cash is defined as the ratio of cash to beginning of year total assets. Leverage is defined as ratio of the sum of long term and short term debt to beginning-of-year total assets. Debt issuance is the ratio of long-term debt issuance to beginning-of-year total assets in a fiscal year. Equity issuance is the ratio of equity issuance to beginning-of-year total assets in a fiscal year. Rated is defined if firm has obtained an S&P rating on its long-term debt. Panel A reports univariate statistics for REITs and Panel B for manufacturing firms.

Panel A: REITs					
	N	Mean	SD	Min	Max
Size	1,093	6.6586	1.4319	1.0699	10.1585
Age	1,093	9.5590	8.1953	0	41
MB	1,127	1.0469	0.3971	0.2853	11.3976
Cashflow	1,127	0.0289	0.0469	-0.3503	0.2752
Div/Assets	1,093	0.0502	0.0294	0.0001	0.1487
Div/Sale	1,086	0.3564	0.1916	0	0.6681
Investment	1,127	0.0030	0.0174	0	0.3661
Tang	377	0.7517	0.2930	0	0.9323
Cash	1,093	0.0450	0.1208	0.0012	0.9649
Leverage	1,098	0.6287	0.3017	0	0.9989
Debt Issuance	1,084	0.2527	0.3138	0	0.9867
Equity Issuance	1,086	0.0757	0.1830	0	0.7715
Rated	1,127	0.3549	0.4787	0	1
Panel B: Manufacturing Firms					
	N	Mean	SD	Min	Max
Size	5,319	6.6472	2.1175	1.0699	11.7862
Age	5,319	24.2854	20.1328	0	103
MB	5,410	1.5308	1.3982	0.1741	11.3976
Cashflow	5,410	0.0329	0.1482	-1.5035	0.2752
Div/Assets	5,319	0.0223	0.0238	0.0000	0.1487
Div/Sale	5,305	0.0271	0.0554	0	0.6681
Investment	5,410	0.0530	0.0395	0	0.3661
Tang	2,004	0.2973	0.1733	0	0.9244
Cash	5,319	0.1204	0.1912	0.0013	0.9522
Leverage	5,716	0.2682	0.2196	0	0.9986
Debt Issuance	5,407	0.1102	0.2234	0	0.9838
Equity Issuance	5,585	0.0309	0.1528	0	0.8798
Rated	5,410	0.4115	0.4921	0	1

Table A2 Panel A: Dividend-to-Assets: Relation between the RMA and dividend payout

The sample is for US REITs and manufacturing firms. The regression model uses firm fixed-effect panel model where the dependent variable is dividend payout. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. Size is defined as the natural logarithm of total assets. Age is defined based on Ritter's founding-year data, or else the first appearance on CRSP. Cash holding (Cash) is defined as the ratio of cash holding to beginning-of-year total assets. Sale growth is defined as annualized growth in sale. Year dummies are included. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. Panel A reports results for dependent variable as the ratio of dividend payout to beginning-of-year total assets and Panel B for the ratio of dividend payout to beginning-of-year sale.

	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Payout(1)	Payout(2)	Payout(3)	Payout(4)
DiD	-0.008***	-0.010***	-0.008***	-0.010***
	(0.002)	(0.002)	(0.002)	(0.002)
MB	0.002***	0.002***	0.002***	0.004***
	(0.001)	(0.001)	(0.001)	(0.000)
Cashflow	0.021***	0.020***	0.048***	0.029***
	(0.005)	(0.005)	(0.013)	(0.004)
Size	-0.006***	-0.007***	-0.008***	-0.007***
	(0.002)	(0.002)	(0.003)	(0.001)
Age	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Cash	0.013***	0.012***	0.011**	0.013***
	(0.004)	(0.004)	(0.005)	(0.003)
Sale growth	0.001***	0.001***	0.002**	0.000
	(0.000)	(0.000)	(0.001)	(0.000)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.838	0.844	0.842	0.776
N	6391	6202	4150	12999
Panel B: Dividend-to-Sale	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Payout(1)	Payout(2)	Payout(3)	Payout(4)
DiD	-0.110***	-0.122***	-0.115***	-0.112***
	(0.012)	(0.012)	(0.013)	(0.013)
MB	0.004	0.002	0.003	0.004***
	(0.002)	(0.002)	(0.003)	(0.001)
Cashflow	0.032**	0.028**	0.115***	0.036***
	(0.014)	(0.012)	(0.041)	(0.014)
Size	0.007	-0.009	0.014	-0.004
	(0.010)	(0.007)	(0.016)	(0.005)
Age	-0.001	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)
Cash	0.013	0.010	0.005	0.021*
	(0.016)	(0.015)	(0.021)	(0.012)
Sale growth	0.006***	0.007***	0.007	0.001**
	(0.002)	(0.002)	(0.007)	(0.001)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.91	0.926	0.909	0.887
N	6391	6202	4150	12999

Table A3: Investment-cash flow sensitivity in the presence of Tangible Assets

The sample is for US REITs and manufacturing firms. The regression model uses firm fixed-effect panel model where the dependent variable is investment (Investment) defined as the ratio of capital expenditure to beginning-of-year total assets. DID*Cashflow is the interaction of DID and Cash flow. Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. RMA*Cashflow is the interaction of RMA and Cash flow. REIT*Cashflow is the interaction of REIT and Cash flow. DID_2003*Cashflow is the interaction of DID_2003 and Cash flow. DID_2003, an interaction of REIT and DIVTAX_2003, is the difference-in-differences estimator. DIVTAX_2003 takes the value one if the year is above 2003, else zero. DIVTAX_2003*Cashflow is the interaction of DIVTAX_2003 and Cash flow. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

	All REITs	Equity REITs	Healthy REITs	Extended Sample	2003 Dividend Tax
Dependent Variable	Investment(1)	Investment(2)	Investment(3)	Investment(4)	Investment(5)
DID*Cashflow	0.008	-0.021	0.010	-0.019	
	(0.035)	(0.037)	(0.054)	(0.042)	
DiD	0.013***	0.013***	0.013***	0.016***	
	(0.002)	(0.003)	(0.002)	(0.002)	
RMA*Cashflow	0.007	0.008	0.007	-0.001	
	(0.016)	(0.028)	(0.016)	(0.012)	
REIT*Cashflow	-0.022	-0.008	-0.028	0.008	0.009
	(0.042)	(0.039)	(0.062)	(0.044)	(0.024)
DID_2003*Cashflow					-0.018
					(0.033)
DiD_2003					0.001
					(0.002)
RMA_2003*Cashflow					0.032***
					(0.012)
MB	0.002**	0.001	0.002**	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cashflow	0.001	0.020	0.001	0.010	-0.013
	(0.017)	(0.025)	(0.017)	(0.012)	(0.013)
Firm-fixed effects	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes
R^2	0.741	0.803	0.731	0.677	0.798
N	6537	4235	6328	13552	5018

Table A4: Relation between the RMA and Debt Issuance

The sample is for US REITs and manufacturing firms. The regression model uses fixed-effect estimation where the dependent variable, Debt Issuance (Debt Issuance), is the ratio of long-term debt issuance to beginning-of-year total assets in a fiscal year. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. Size is defined as the natural logarithm of the total assets. Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Cash is defined as the ratio of cash holding to beginning-of-year total assets. CapEx is defined as the ratio of capital expenditure to beginning-of-year total assets. Sale growth is defined as annualized growth in sale. Year dummies are included. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Debt Issuance(1)	Debt Issuance(2)	Debt Issuance(3)	Debt Issuance(4)
DiD	-0.175***	-0.190***	-0.183***	-0.162***
	(0.026)	(0.026)	(0.026)	(0.021)
Size	0.160***	0.162***	0.109***	0.099***
	(0.022)	(0.021)	(0.026)	(0.010)
Cashflow	-0.082	-0.080	-0.015	-0.126***
	(0.051)	(0.049)	(0.091)	(0.037)
MB	-0.002**	-0.002**	-0.003***	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	0.096	0.065	0.067	0.102**
	(0.060)	(0.049)	(0.080)	(0.041)
CapEx	0.038	0.023	0.138	0.248***
	(0.147)	(0.147)	(0.151)	(0.090)
Sale growth	0.017***	0.016***	0.027***	0.001
	(0.005)	(0.006)	(0.009)	(0.002)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.574	0.566	0.608	0.5
N	6364	6180	4154	13037

Table A5: Relation between the RMA and Equity Issuance

The sample is for US REITs and manufacturing firms. The regression model uses fixed-effect estimation where the dependent variable, Equity Issuance (Equity Issuance), is the ratio of equity issuance to beginning-of-year total assets in a fiscal year. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. Size is defined as the natural logarithm of the total assets. Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Cash is defined as the ratio of cash holding to beginning-of-year total assets. CapEx is defined as the ratio of capital expenditure to beginning-of-year total assets. Sale growth is defined as annualized growth in sale. Year dummies are included. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Equity Issuance(1)	Equity Issuance(2)	Equity Issuance(3)	Equity Issuance(4)
DiD	-0.073***	-0.086***	-0.064***	-0.079***
	(0.014)	(0.016)	(0.014)	(0.012)
Size	-0.001	-0.013	0.006	0.009*
	(0.013)	(0.013)	(0.018)	(0.005)
Cashflow	-0.075	-0.069	-0.143	-0.071**
	(0.056)	(0.057)	(0.117)	(0.034)
MB	-0.001*	-0.001*	-0.002*	-0.001**
	(0.001)	(0.001)	(0.001)	(0.000)
Cash	0.596***	0.586***	0.635***	0.522***
	(0.074)	(0.075)	(0.099)	(0.053)
CapEx	0.103*	0.102*	0.106	0.135***
	(0.061)	(0.060)	(0.108)	(0.043)
Sale growth	0.000	-0.005	0.014*	0.001
	(0.007)	(0.003)	(0.008)	(0.001)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.702	0.712	0.727	0.657
N	6538	6351	4244	13278

Table A6: Relation between the RMA and Leverage

The sample is for US REITs and manufacturing firms. The regression model uses firm fixed-effect panel model where the dependent variable is total leverage (Leverage) defined as ratio of the sum of long term and short term debt to beginning-of-year total assets. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. Size is defined as the natural logarithm of the total assets. Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Cash is defined as the ratio of cash holding to beginning-of-year total assets. CapEx is defined as the ratio of capital expenditure to beginning-of-year total assets. Sale growth is defined as annualized growth in sale. Year dummies are included. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Leverage(1)	Leverage(2)	Leverage(3)	Leverage(4)
DiD	-0.090***	-0.105***	-0.093***	-0.069***
	(0.018)	(0.019)	(0.019)	(0.019)
Size	0.233***	0.222***	0.195***	0.141***
	(0.017)	(0.019)	(0.021)	(0.010)
Cashflow	-0.221***	-0.221***	-0.125	-0.307***
	(0.063)	(0.063)	(0.081)	(0.042)
MB	0.000	0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Cash	0.052	0.026	0.028	0.072*
	(0.045)	(0.043)	(0.058)	(0.037)
CapEx	-0.081	-0.092	0.078	0.037
	(0.136)	(0.137)	(0.136)	(0.080)
Sale growth	0.013***	0.013**	0.020**	0.001
	(0.005)	(0.005)	(0.009)	(0.001)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.8	0.783	0.858	0.737
N	6681	6493	4323	13599

Table A7: Cash flow sensitivity of Cash

The sample is for US REITs and manufacturing firms. The regression model uses firm fixed-effect panel model where the dependent variable is cash (Cash) defined as the ratio of cash holding to beginning-of-year total assets. DID*Cashflow is the interaction of DID and Cash flow. DID, an interaction of REIT and RMA, is the difference-in-differences estimator. REIT takes the value one if the firm is a REIT, else zero. RMA takes the value one if the year is 2000 or above, else zero. RMA*Cashflow is the interaction of RMA and Cash flow. REIT*Cashflow is the interaction of REIT and Cash flow. Cash flow (Cashflow) is defined as the ratio of income before extraordinary items to beginning-of-year total assets. Market-to-book ratio (MB) is defined as in Frank and Goyal (2009). Size is defined as the natural logarithm of the total assets. Year dummies are included. Standard errors, clustered at firm level, are in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

	All REITs	Equity REITs	Healthy REITs	Extended Sample
Dependent Variable	Cash(1)	Cash(2)	Cash(3)	Cash(4)
DID*Cashflow	-0.316	-0.495	-0.489	0.107
	(0.333)	(0.336)	(0.398)	(0.212)
DiD	-0.016	-0.006	-0.015	-0.032***
	(0.016)	(0.014)	(0.024)	(0.010)
RMA*Cashflow	0.020	0.013	0.127	0.125*
	(0.085)	(0.085)	(0.188)	(0.072)
REIT*Cashflow	0.196	0.350	0.043	-0.218**
	(0.348)	(0.350)	(0.412)	(0.111)
Cashflow	0.242***	0.242***	0.487**	0.279***
	(0.083)	(0.082)	(0.202)	(0.053)
MB	0.011	0.011	0.005	0.009
	(0.009)	(0.009)	(0.009)	(0.006)
Size	0.031**	0.043***	0.035**	0.006
	(0.012)	(0.015)	(0.016)	(0.006)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R^2	0.792	0.799	0.836	0.737
N	6412	6217	4163	13037