

Li and Zhang (2010)

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1 Introduction

- ▶ Q-theory relates the cross-section of corporate investments and expected returns
- ▶ The theory predicts that the investment-return relation is more negative for financially constrained firms
- ▶ If the theory works, then it will capture the (1) more (2) negative relation empirically
- ▶ The author's one—http://theinvestmentcapm.com/LiZhang2010JFE_Notes.pdf—for more details

1 Introduction (cont.)

1. The investment-return relation strengthens in the subsamples with financing frictions
2. However, the constraints do not explain the corporate investments
3. Limits-to-arbitrage variables rather than financial constraint variables better explain the investment-return relation/anomaly

2 Hypothesis Development

- Optimization

$$\max_{\{I_{i0}\}} \Pi K_{i0} - I_{i0} - \frac{\lambda_i}{2} \left(\frac{I_{i0}}{K_{i0}} \right)^2 K_{i0} + \frac{1}{R_i} [\Pi K_{i1} + (1 - \delta) K_{i1}]$$

- First-order condition

$$R_i = \frac{\Pi + 1 - \delta}{1 + \lambda_i (I_{i0}^*/K_{i0})}$$

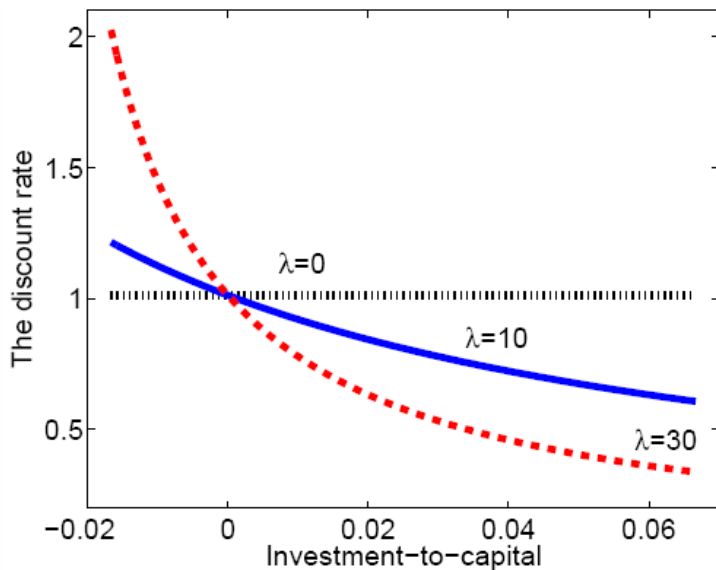
- The investment-return relation is negative

$$\frac{d(I_{i0}^*/K_{i0})}{dR_i} = - \frac{[1 + \lambda_i (I_{i0}^*/K_{i0})]^2}{\lambda_i (\Pi + 1 - \delta)} < 0$$

- Increasing λ_i reinforces the negative relation

$$\frac{d \left| \frac{d(I_{i0}^*/K_{i0})}{dR_i} \right|}{d\lambda_i} = - \frac{[1 + \lambda_i (I_{i0}^*/K_{i0})]^2}{\lambda_i^2 (\Pi + 1 - \delta)} < 0$$

Figure 1: The Negative Relation Steepens as λ Increases



3 Data

- ▶ 1963–2008, end-of-June updating, Fama–MacBeth
- ▶ Financing constraints
 1. Asset size—smaller firms (smallest tercile) are more constrained
 - ▶ Gilchrist and Himmelberg (1995), Erickson and Whited (2000), Almeida and Campello (2007)
 2. Payout ratio—firms paying less (smallest tercile) are more constrained
 - ▶ Fazzari et al. (1988), Almeida et al. (2004), Almeida and Campello (2007)
 3. Bond ratings—unrated firms (positive long-term debt with no rate) are more constrained
 - ▶ Kashyap et al. (1994), Cummins et al. (1999), Almeida et al. (2004), Almeida and Campello (2007)

3 Data (cont.)

► Anomalies

1. Investment-to-assets— $(PPE + \Delta \text{Inventories}) / L\text{Assets}$
 - Lyandres et al. (2008), Chen and Zhang (2010)
2. Assets growth— $\Delta \text{Assets} / L\text{Assets}$
 - Cooper et al. (2008)
3. Investment growth— $\Delta \text{Capex} / L\text{Capex}$
 - Xing (2008)
4. Net stock issues— $\log \text{ of } SHROUT / LSHROUT$
 - Market timing: Ritter (1991), Loughran and Ritter (1995), Ikenberry et al. (1995)
 - Excessive investment: Li et al. (2008), Lyandres et al. (2008)
5. Abnormal corporate investment— $\frac{\text{Capex this year}}{\text{Capex last 3 years}} - 1$
 - Titman et al. (2004)
6. Net operating assets— $(OA - OL) / L\text{Assets}$
 - Hirshleifer et al. (2004)

3 Data (cont.)

- ▶ Limits-to-arbitrage; Ali et al. (2003)
 1. Idiosyncratic volatility—more volatile firms (highest tercile) are more limited
 - ▶ High idiosyncratic volatility means costly and limited arbitrage as arbitrageurs are not diversified so not compensated
 2. Dollar trading volume—firms less traded (lowest tercile) are more limited
 - ▶ High transaction costs limit arbitrage so active trading mitigates this concern and vice versa

4 Empirical Results

Table

1. is the descriptive statistics
2. is the main table—the different negative relations by financing constraints, Fama–MacBeth
3. is the robustness check—January, size/book-to-market/momentum
4. is the different negative relations by limits-to-arbitrage
5. is the corresponding robustness check
6. is the number of observations after the two-way sorts by financing/investment frictions
7. is the different negative relations after controlling financing/investment frictions

Table 1: Descriptive Statistics. Smaller Firms (1) Pay Less, (2) Are Limited to Arbitrage, and (3) Invest Less

Panel A: Descriptive statistics											
	Mean	Std	Min	25%	Median	75%	Max				
Asset size	846.07	2974.09	1.13	23.35	85.50	383.42	44319.00				
Payout ratio	0.14	0.27	0.00	0.00	0.04	0.18	3.12				
d(rating)	0.53	0.50	0.00	0.00	1.00	1.00	1.00				
Ivol	15.51	9.67	3.05	8.70	13.02	19.49	76.31				
Dvol	1.20	6.08	0.00	0.00	0.03	0.26	121.35				
<i>I/A</i>	0.06	0.22	−0.49	−0.01	0.05	0.13	2.37				
$\Delta A/A$	0.12	0.45	−0.63	−0.04	0.07	0.19	7.08				
$\Delta I/I$	0.33	1.64	−0.98	−0.46	0.00	0.50	19.00				
<i>NSI</i>	0.03	0.13	−0.23	0.00	0.00	0.03	1.13				
<i>ACI</i>	−0.20	0.87	−0.99	−0.88	−0.33	0.10	6.88				
<i>NOA</i>	0.64	0.39	−0.46	0.46	0.69	0.84	4.03				
Panel B: Cross correlations (Spearman)											
	Asset size	Payout ratio	d(rating)	Ivol	Dvol	<i>I/A</i>	$\Delta A/A$	$\Delta I/I$	<i>NSI</i>	<i>ACI</i>	<i>NCO</i>
Asset size	1										
Payout ratio	0.45**	1									
d(rating)	−0.37**	−0.21**	1								
Ivol	−0.64**	−0.55**	0.29**	1							
Dvol	0.73**	0.27**	−0.35**	−0.39**	1						
<i>I/A</i>	0.13**	0.00	−0.01	−0.10**	0.21**	1					
$\Delta A/A$	0.17**	0.02**	−0.05**	−0.14**	0.26**	0.73**	1				
$\Delta I/I$	0.12**	0.05**	−0.02**	−0.10**	0.19**	0.54**	0.47**	1			
<i>NSI</i>	0.10**	−0.15**	−0.04**	0.02	0.22**	0.39**	0.47**	0.30**	1		
<i>ACI</i>	0.29**	0.23**	−0.08**	−0.25**	0.26**	0.31**	0.23**	0.54**	0.14**	1	
<i>NOA</i>	0.24**	0.09**	0.00	−0.18**	0.16**	0.56**	0.60**	0.34**	0.36**	0.22**	1

Table 2: Overall Negative and More If I/A and $\Delta A/A$

	Panel A: <i>I/A</i>	Panel B: $\Delta A/A$	Panel C: $\Delta I/I$	Panel D: <i>NSI</i>	Panel E: <i>ACI</i>	Panel F: <i>NOA</i>
Full Sample	-0.69 (-4.92) {3,148}	-0.74 (-8.28) {3,148}	-0.08 (-5.45) {3,148}	-1.87 (-6.98) {3,148}	-0.05 (-1.58) {3,117}	-0.51 (-5.05) {3,148}
Small asset size	-0.85 (-5.12) {1,020}	-0.83 (-7.82) {1,020}	-0.09 (-5.03) {1,020}	-1.27 (-3.78) {1,020}	-0.04 (-0.97) {1,010}	-0.47 (-3.70) {1,020}
Big asset size	-0.33 (-1.63) {1,050}	-0.47 (-3.53) {1,050}	-0.05 (-1.37) {1,050}	-1.50 (-4.70) {1,050}	0.02 (0.44) {1,040}	-0.45 (-5.01) {1,050}
Small-minus-big	-2.13	-2.39	-0.87	0.58	-1.00	-0.11
Low payout ratio	-0.93 (-5.63) {1,269}	-0.81 (-7.81) {1,269}	-0.10 (-4.81) {1,269}	-1.39 (-4.50) {1,269}	-0.08 (-2.10) {1,259}	-0.50 (-4.45) {1,269}
High payout ratio	-0.39 (-2.00) {1,146}	-0.66 (-5.17) {1,146}	-0.06 (-2.49) {1,146}	-2.20 (-6.07) {1,146}	-0.03 (-0.83) {1,136}	-0.56 (-4.24) {1,146}
Low-minus-high	-2.49	-1.24	-1.37	1.91	-1.22	0.52
Without bond rating	-0.86 (-5.95) {1,683}	-0.90 (-9.44) {1,683}	-0.10 (-6.11) {1,683}	-1.86 (-6.04) {1,683}	-0.03 (-0.94) {1,671}	-0.50 (-4.86) {1,683}
With bond rating	-0.47 (-2.61) {1,466}	-0.50 (-4.43) {1,466}	-0.05 (-2.30) {1,466}	-1.82 (-5.85) {1,466}	-0.09 (-2.30) {1,446}	-0.51 (-4.23) {1,466}
Without-minus-with	-2.49	-3.77	-2.41	-0.11	1.61	0.21

Table 3a: Slightly Weakens After January Effect

Panel A: No January returns (July 1963–December 2008, 513 months)						
	I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Full Sample	−0.55 (−3.91)	−0.60 (−6.82)	−0.09 (−6.24)	−2.02 (−7.66)	0.00 (0.09)	−0.39 (−3.79)
Small asset size	−0.72 (−4.40)	−0.73 (−6.95)	−0.08 (−4.80)	−1.79 (−5.82)	−0.03 (−0.62)	−0.44 (−3.35)
Big asset size	−0.30 (−1.45)	−0.39 (−2.95)	−0.06 (−1.61)	−1.62 (−4.94)	0.05 (1.12)	−0.44 (−4.72)
Small-minus-big	[−1.63]	[−2.16]	[−0.43]	[−0.42]	[−1.22]	[0.06]
Low payout ratio	−0.68 (−4.22)	−0.64 (−6.33)	−0.09 (−4.33)	−1.59 (−5.27)	−0.04 (−1.09)	−0.43 (−3.72)
High payout ratio	−0.32 (−1.65)	−0.47 (−3.76)	−0.08 (−3.51)	−2.22 (−6.21)	−0.01 (−0.22)	−0.37 (−2.77)
Low-minus-high	[−1.64]	[−1.41]	[−0.21]	[1.50]	[−0.77]	[−0.50]
Without bond rating	−0.74 (−5.12)	−0.77 (−8.12)	−0.10 (−6.40)	−2.11 (−6.97)	0.01 (0.28)	−0.42 (−4.05)
With bond rating	−0.27 (−1.51)	−0.35 (−3.16)	−0.06 (−2.98)	−1.88 (−6.06)	−0.03 (−0.73)	−0.34 (−2.73)
Without-minus-with	[−3.04]	[−3.94]	[−1.87]	[−0.68]	[1.03]	[−0.93]

Table 3b: More Weakens After Size, B/M, and Momentum

Panel B: Controlling for size, book-to-market, and prior returns (July 1963–December 2008, 558 months)						
	I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Full Sample	−0.49 (−3.84)	−0.52 (−6.43)	−0.07 (−5.22)	−1.28 (−5.66)	−0.02 (−1.03)	−0.56 (−6.83)
Small asset size	−0.68 (−4.28)	−0.57 (−5.65)	−0.07 (−4.13)	−0.88 (−2.84)	−0.07 (−1.81)	−0.67 (−5.54)
Big asset size	−0.20 (−1.06)	−0.38 (−3.25)	−0.04 (−1.33)	−1.38 (−4.94)	0.02 (0.59)	−0.43 (−4.85)
Small-minus-big	[−2.14]	[−1.32]	[−0.58]	[1.39]	[−1.68]	[−1.71]
Low payout ratio	−0.62 (−4.43)	−0.51 (−6.06)	−0.06 (−3.73)	−0.89 (−3.19)	−0.05 (−1.57)	−0.51 (−5.03)
High payout ratio	−0.27 (−1.56)	−0.45 (−3.83)	−0.06 (−2.79)	−1.73 (−5.83)	−0.01 (−0.38)	−0.63 (−6.24)
Low-minus-high	[−1.76]	[−0.50]	[−0.17]	[2.35]	[−0.95]	[1.08]
Without bond rating	−0.65 (−4.80)	−0.65 (−7.57)	−0.08 (−5.23)	−1.28 (−4.86)	−0.01 (−0.37)	−0.59 (−6.36)
With bond rating	−0.23 (−1.42)	−0.29 (−2.74)	−0.05 (−2.41)	−1.28 (−4.79)	−0.05 (−1.49)	−0.44 (−4.85)
Without-minus-with	[−2.83]	[−3.55]	[−1.25]	[−0.03]	[1.08]	[−1.80]

Table 4: The Investment Anomalies by Limits-to-Arbitrage

The Anomalies Are Stronger in the Subsamples with Limits-to-Arbitrage

	Panel A: I/A	Panel B: $\Delta A/A$	Panel C: $\Delta I/I$	Panel D: NSI	Panel E: ACI	Panel F: NOA
Low Ivol	-0.10 (-0.56) {1,052}	-0.16 (-1.24) {1,052}	-0.02 (-0.65) {1,052}	-1.49 (-4.98) {1,052}	-0.01 (-0.32) {1,042}	-0.29 (-3.61) {1,052}
High Ivol	-1.01 (-5.95) {1,021}	-0.99 (-9.57) {1,021}	-0.10 (-5.10) {1,021}	-1.54 (-5.07) {1,021}	-0.05 (-1.25) {1,011}	-0.61 (-5.06) {1,021}
High-minus-low Ivol	-4.20 (-6.08) {922}	-5.65 (-6.27) {922}	-2.72 (-4.30) {922}	-0.11 (-4.92) {922}	-0.77 (-2.94) {916}	-2.39 (-5.60) {922}
Low Dvol	-1.18 (-6.08) {922}	-0.94 (-6.27) {922}	-0.09 (-4.30) {922}	-1.82 (-4.92) {922}	-0.12 (-2.94) {916}	-0.80 (-5.60) {922}
High Dvol	-0.45 (-2.20) {954}	-0.50 (-3.40) {954}	-0.09 (-2.65) {954}	-1.54 (-4.28) {954}	-0.02 (-0.40) {948}	-0.47 (-3.98) {954}
Low-minus-high Dvol	-2.75 (-6.08) {922}	-2.19 (-6.27) {922}	-0.02 (-4.30) {922}	-0.61 (-4.92) {922}	-1.79 (-2.94) {916}	-2.19 (-5.60) {922}

Table 5: Ivol Is Robust After Controlling but Dvol Is Not

	I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Panel A: No January returns (July 1963–December 2008, 513 months)						
Low Ivol	−0.07 (−0.40)	−0.06 (−0.48)	−0.03 (−1.07)	−1.28 (−4.14)	−0.01 (−0.16)	−0.26 (−3.14)
High Ivol	−0.92 (−5.45)	−0.89 (−8.75)	−0.10 (−5.04)	−1.82 (−6.34)	−0.03 (−0.79)	−0.60 (−4.90)
High-minus-low Ivol	−3.82 [−3.82]	−5.58 [−5.58]	−2.19 [−2.19]	−1.37 [−1.37]	−0.49 [−0.49]	−2.44 [−2.44]
Low Dvol	−0.90 (−4.64)	−0.67 (−4.57)	−0.09 (−4.51)	−2.14 (−6.11)	−0.06 (−1.56)	−0.60 (−4.14)
High Dvol	−0.42 (−1.93)	−0.50 (−3.30)	−0.10 (−2.94)	−1.71 (−4.70)	0.01 (0.28)	−0.47 (−3.76)
Low-minus-high Dvol	−1.76 [−1.76]	−0.81 [−0.81]	0.28 [0.28]	−0.95 [−0.95]	−1.35 [−1.35]	−0.86 [−0.86]
Panel B: Controlling for size, book-to-market, and prior returns (July 1963–December 2008, 558 months)						
Low Ivol	0.01 (0.04)	−0.11 (−0.98)	−0.03 (−1.49)	−1.15 (−4.47)	0.00 (0.14)	−0.33 (−4.34)
High Ivol	−0.83 (−5.17)	−0.70 (−7.28)	−0.08 (−4.08)	−0.98 (−3.31)	−0.04 (−1.09)	−0.71 (−6.07)
High-minus-low Ivol	−4.09 [−4.09]	−4.41 [−4.41]	−1.48 [−1.48]	0.46 [0.46]	−0.91 [−0.91]	−2.89 [−2.89]
Low Dvol	−0.90 (−5.01)	−0.73 (−5.41)	−0.07 (−3.57)	−1.50 (−4.35)	−0.07 (−2.17)	−0.71 (−5.58)
High Dvol	−0.25 (−1.46)	−0.36 (−3.40)	−0.07 (−2.48)	−1.38 (−4.79)	−0.02 (−0.60)	−0.50 (−4.91)
Low-minus-high Dvol	−2.84 [−2.84]	−2.26 [−2.26]	−0.00 [−0.00]	−0.26 [−0.26]	−1.08 [−1.08]	−1.41 [−1.41]

Table 6: Number of Observations After Two-Way Sorts

Panel A: Idiosyncratic volatility (Ivol) as the limits-to-arbitrage proxy							
		I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Small asset	Low Ivol	397	397	397	397	393	397
	High Ivol	1,160	1,160	1,160	1,160	1,150	1,160
Big asset	Low Ivol	1,191	1,191	1,191	1,191	1,180	1,191
	High Ivol	395	395	395	395	391	395
Low payout ratio	Low Ivol	439	439	439	439	433	439
	High Ivol	1,058	1,058	1,058	1,058	1,048	1,058
High payout ratio	Low Ivol	1,146	1,146	1,146	1,146	1,136	1,146
	High Ivol	493	493	493	493	487	493
Without bond rating	Low Ivol	662	662	662	662	657	662
	High Ivol	1,021	1,021	1,021	1,021	1,013	1,021
With bond rating	Low Ivol	928	928	928	928	916	928
	High Ivol	538	538	538	538	530	538
Panel B: Dollar trading volume (Dvol) as the limits-to-arbitrage proxy							
		I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Small asset	Low Dvol	1,034	1,034	1,034	1,034	1,026	1,034
	High Dvol	268	268	268	268	266	268
Big asset	Low Dvol	364	364	364	364	362	364
	High Dvol	1,163	1,163	1,163	1,163	1,156	1,163
Low payout ratio	Low Dvol	766	766	766	766	761	766
	High Dvol	521	521	521	521	517	521
High payout ratio	Low Dvol	628	628	628	628	624	628
	High Dvol	906	906	906	906	901	906
Without bond rating	Low Dvol	953	953	953	953	948	953
	High Dvol	498	498	498	498	495	498
With bond rating	Low Dvol	446	446	446	446	441	446
	High Dvol	934	934	934	934	927	934

Table 7a: Ivol Survives After Frictions but Not Vice Versa

Panel A: Idiosyncratic volatility (Ivol) as the limits-to-arbitrage proxy						
	I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Low Ivol, small-minus-big asset	0.06 [0.29]	0.04 [0.31]	-0.06 [-1.68]	-0.58 [-1.26]	-0.04 [-0.87]	0.10 [0.89]
High Ivol, small-minus-big asset	-0.14 [-0.56]	-0.16 [-1.06]	0.01 [0.38]	-0.07 [-0.15]	-0.01 [-0.25]	0.05 [0.36]
Low Ivol, low-minus-high payout	-0.40 [-2.07]	-0.18 [-1.42]	-0.05 [-1.58]	-0.31 [-0.75]	-0.12 [-2.62]	-0.06 [-0.55]
High Ivol, low-minus-high payout	-0.16 [-0.70]	-0.15 [-1.02]	-0.01 [-0.25]	0.47 [0.99]	0.00 [0.05]	-0.02 [-0.14]
Low Ivol, without-minus-with rating	-0.19 [-1.13]	-0.15 [-1.14]	-0.04 [-1.49]	-0.29 [-0.77]	-0.02 [-0.41]	0.16 [1.69]
High Ivol, without-minus-with rating	-0.21 [-1.03]	-0.33 [-2.46]	-0.03 [-1.10]	-0.04 [-0.10]	0.08 [1.49]	-0.06 [-0.52]
Small asset, high-minus-low Ivol	-0.63 [-2.85]	-0.57 [-3.75]	-0.01 [-0.56]	0.83 [1.80]	0.03 [0.73]	-0.25 [-1.94]
Big asset, high-minus-low Ivol	-0.43 [-1.81]	-0.37 [-2.43]	-0.09 [-2.18]	0.32 [0.74]	0.01 [0.09]	-0.20 [-1.58]
Low payout, high-minus-low Ivol	-0.38 [-1.92]	-0.43 [-3.11]	-0.02 [-0.81]	0.54 [1.26]	0.09 [1.85]	-0.18 [-1.52]
High payout, high-minus-low Ivol	-0.61 [-2.38]	-0.46 [-2.70]	-0.06 [-1.84]	-0.24 [-0.50]	-0.03 [-0.50]	-0.22 [-1.58]
Without rating, high-minus-low Ivol	-0.59 [-2.75]	-0.61 [-4.15]	-0.05 [-1.62]	0.40 [0.96]	0.03 [0.67]	-0.32 [-2.68]
With rating, high-minus-low Ivol	-0.57 [-2.42]	-0.43 [-2.74]	-0.06 [-1.63]	0.16 [0.35]	-0.06 [-1.03]	-0.09 [-0.68]

Table 7b: Whereas Dvol Partially Survives After Frictions

Panel B: Dollar trading volume (Dvol) as the limits-to-arbitrage proxy						
	I/A	$\Delta A/A$	$\Delta I/I$	NSI	ACI	NOA
Low Dvol, small-minus-big asset	-0.96 [-3.08]	-0.34 [-1.60]	-0.06 [-1.30]	-0.21 [-0.35]	-0.10 [-1.62]	-0.18 [-0.90]
High Dvol, small-minus-big asset	0.10 [0.28]	-0.10 [-0.44]	-0.01 [-0.21]	0.31 [0.39]	-0.10 [-1.27]	0.17 [0.86]
Low Dvol, low-minus-high payout	-0.41 [-1.59]	-0.21 [-1.20]	-0.04 [-1.42]	1.16 [2.01]	-0.03 [-0.58]	0.06 [0.38]
High Dvol, low-minus-high payout	-0.33 [-1.40]	-0.13 [-0.85]	-0.02 [-0.58]	0.35 [0.65]	-0.05 [-0.81]	0.09 [0.59]
Low Dvol, without-minus-with rating	-0.57 [-2.02]	-0.71 [-3.68]	-0.03 [-0.82]	-0.62 [-1.10]	0.04 [0.82]	-0.18 [-1.13]
High Dvol, without-minus-with rating	-0.37 [-1.68]	-0.25 [-1.64]	-0.06 [-1.70]	-0.25 [-0.58]	0.08 [1.48]	-0.04 [-0.28]
Small asset, low-minus-high Dvol	-0.80 [-2.28]	-0.37 [-1.57]	-0.04 [-0.82]	-0.51 [-0.65]	0.00 [0.05]	-0.28 [-1.37]
Big asset, low-minus-high Dvol	0.26 [1.00]	-0.13 [-0.58]	0.01 [0.14]	0.01 [0.01]	0.01 [0.11]	0.07 [0.42]
Low payout, low-minus-high Dvol	-0.57 [-2.40]	-0.38 [-2.23]	-0.01 [-0.36]	-0.15 [-0.25]	-0.03 [-0.61]	-0.26 [-1.68]
High payout, low-minus-high Dvol	-0.49 [-2.09]	-0.30 [-1.59]	0.01 [0.22]	-0.96 [-1.94]	-0.05 [-0.99]	-0.23 [-1.51]
Without rating, low-minus-high Dvol	-0.50 [-2.00]	-0.44 [-2.51]	0.00 [0.15]	-0.26 [-0.53]	-0.10 [-1.88]	-0.22 [-1.53]
With rating, low-minus-high Dvol	-0.30 [-1.04]	0.03 [0.16]	-0.03 [-0.74]	0.11 [0.21]	-0.07 [-1.16]	-0.08 [-0.44]

5 Conclusion

- ▶ Theory: Q -theory says
 1. The investment-return relation to be negative
 2. The negativity deepens as more financially constrained
- ▶ Evidence: According to the results
 1. The investment-return relation (the investment anomalies) is negative overall (I/A , $\Delta A/A$, $\Delta I/I$, NSI, ACI, NOA)
 2. The negative relation steepens in the subsamples with financial frictions but weak (I/A , $\Delta A/A$, weakens after the January effect or size, B/M , momentum)
 3. Limits-to-arbitrage variables (investment frictions, $Ivol$, $Dvol$) better explain the investment anomalies
 4. The difference in the negative relations due to financial frictions (I/A , $\Delta A/A$) disappears after investment frictions ($Ivol$, $Dvol$), but not vice versa, advocating the Limits-to-Arbitrage story rather than the Q -theory