Surfing the Cycle: Cyclical Investment Opportunities and Firms' Risky Financial Assets

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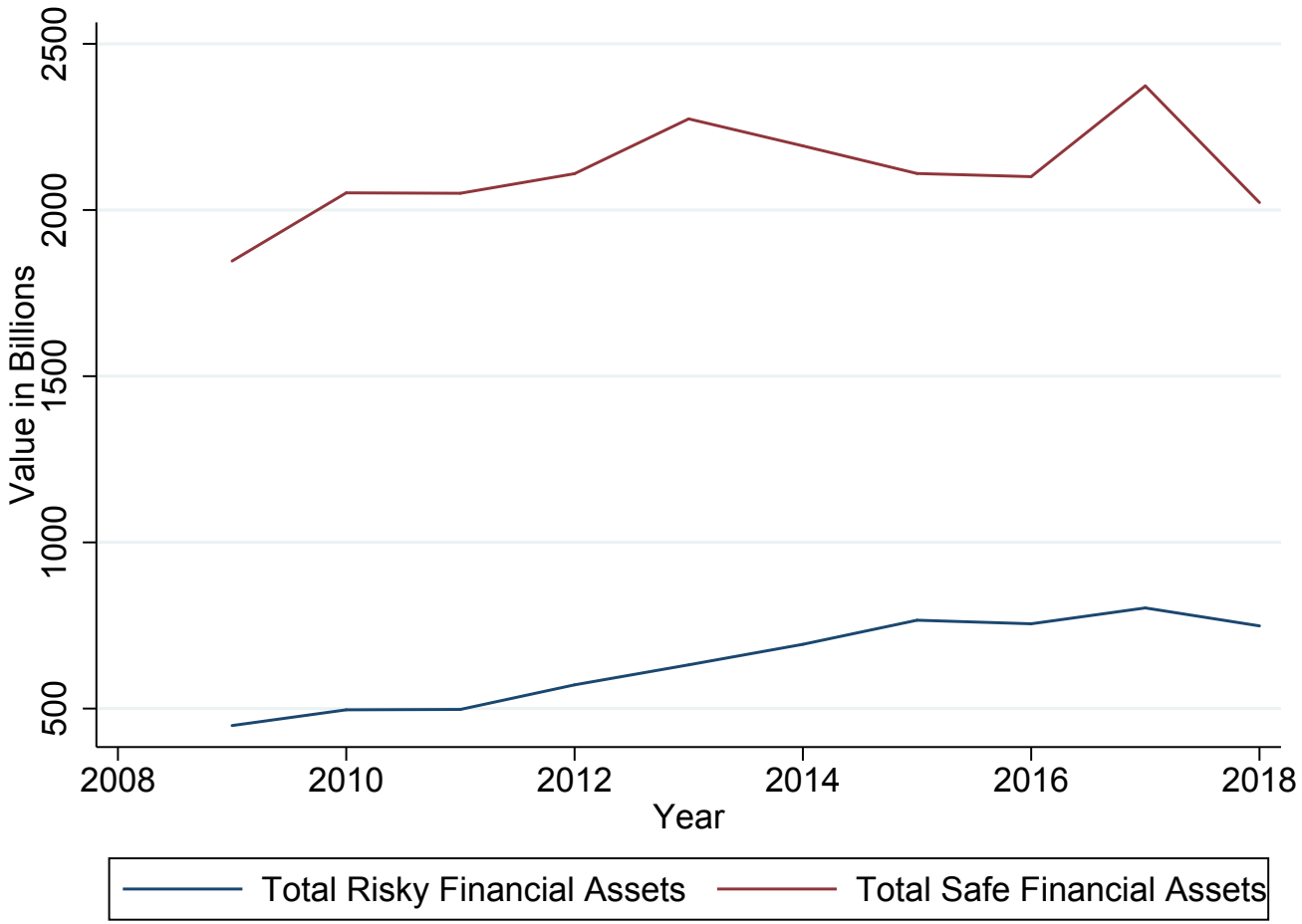
Motivation

Figure: Corporate Savings over Time

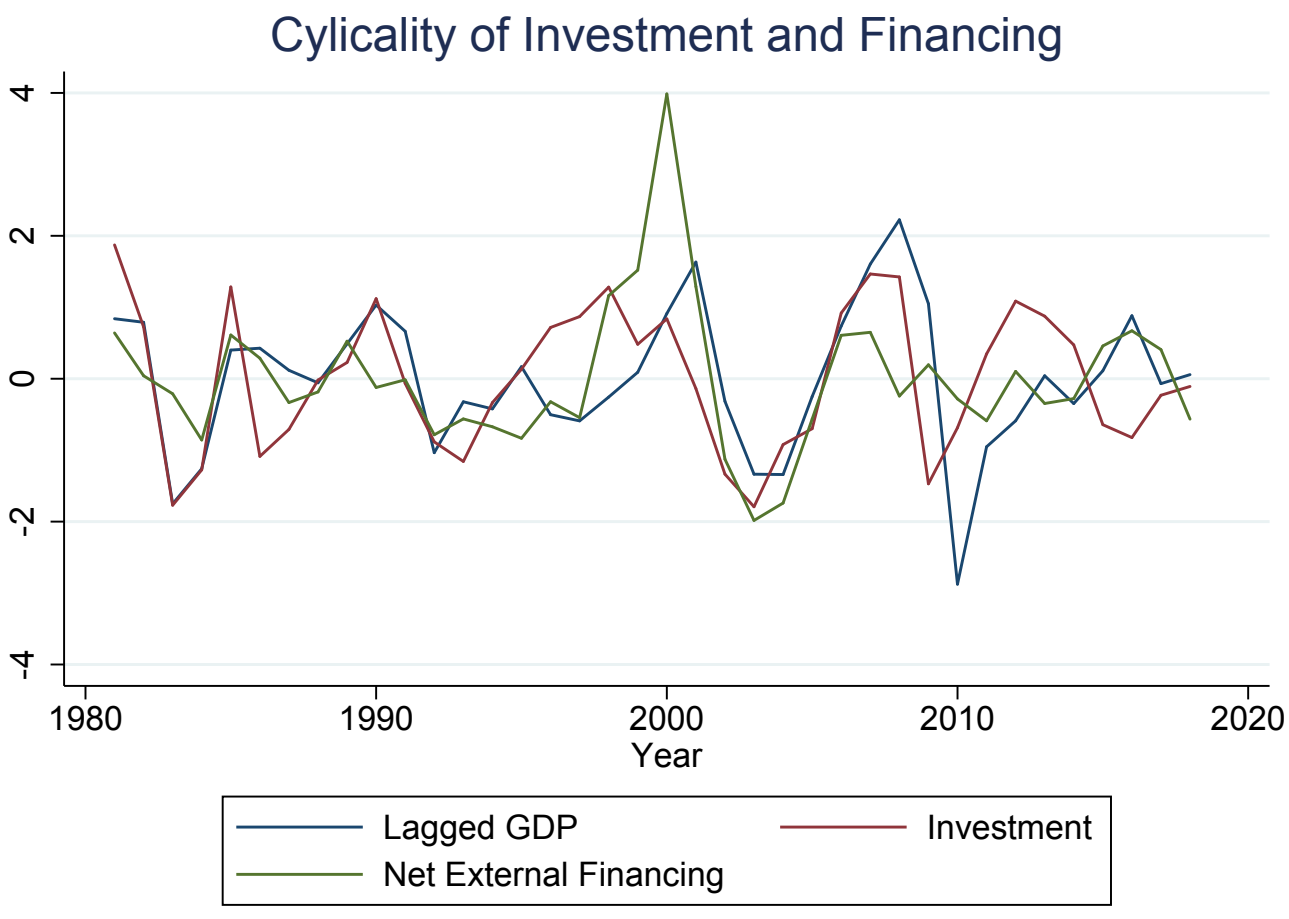


Puzzling Question

Why do non-financial firms hold risky financial assets?

- Without positive abnormal returns, no value creation from holding risky financial assets;
- "Cash" holding is associated with tax costs;
- "Precautionary" saving?

Cyclicality of Investment and Financing



Main Results

- Both profits and investment opportunities are pro-cyclical, investing in risky financial assets is naturally optimal when
  - The firm needs more funding than profits to finance investment in economic booms;
  - External financing is costly.
- Based on a sample of firms' risky financial asset holdings scraped from the SEC 10-K filings, I find
  - Firms with more pro-cyclical "funding gap" (investment funding demand in excess of profits) hold more risky financial assets.

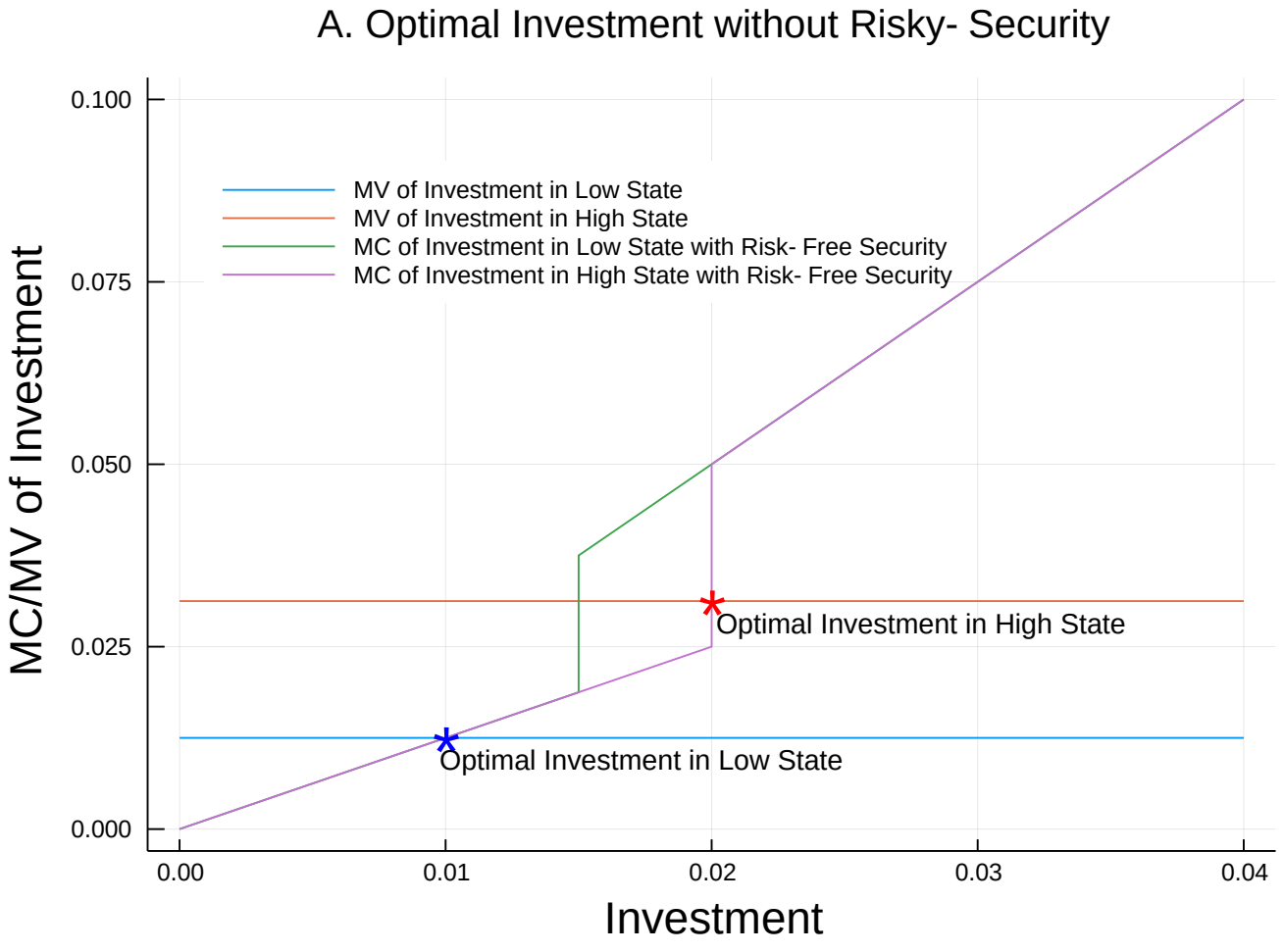
Related Literature

- Determinants of corporate saving compositions
  - Duchin, Gilbert, Harford, and Hrdlicka (2017)
  - Brown (2014); Cardella, Fairhurst, and Klasa (2015)
- Firm/CEO characteristics and corporate cash holdings
  - Opler, Pinkowitz, Stulz, and Williamson (1999); Bates, Kahle, and Stulz (2009); Liu and Mauer (2011)
- Costs incentives and corporate cash holdings
  - Foley, Hartzell, Titman, and Twite (2007); Azar, Kagy, and Schmalz (2016); De Simone, Piotroski, and Tomy (2018)
- Risk Management
  - Smith and Stulz (1985); Froot, Scharfstein, and Stein (1993); Faulkender (2005)

Roadmap

- Model Intuition
- Numerical Experiments
- Data
- Empirical Results
- Conclusion

Key Intuition Illustration



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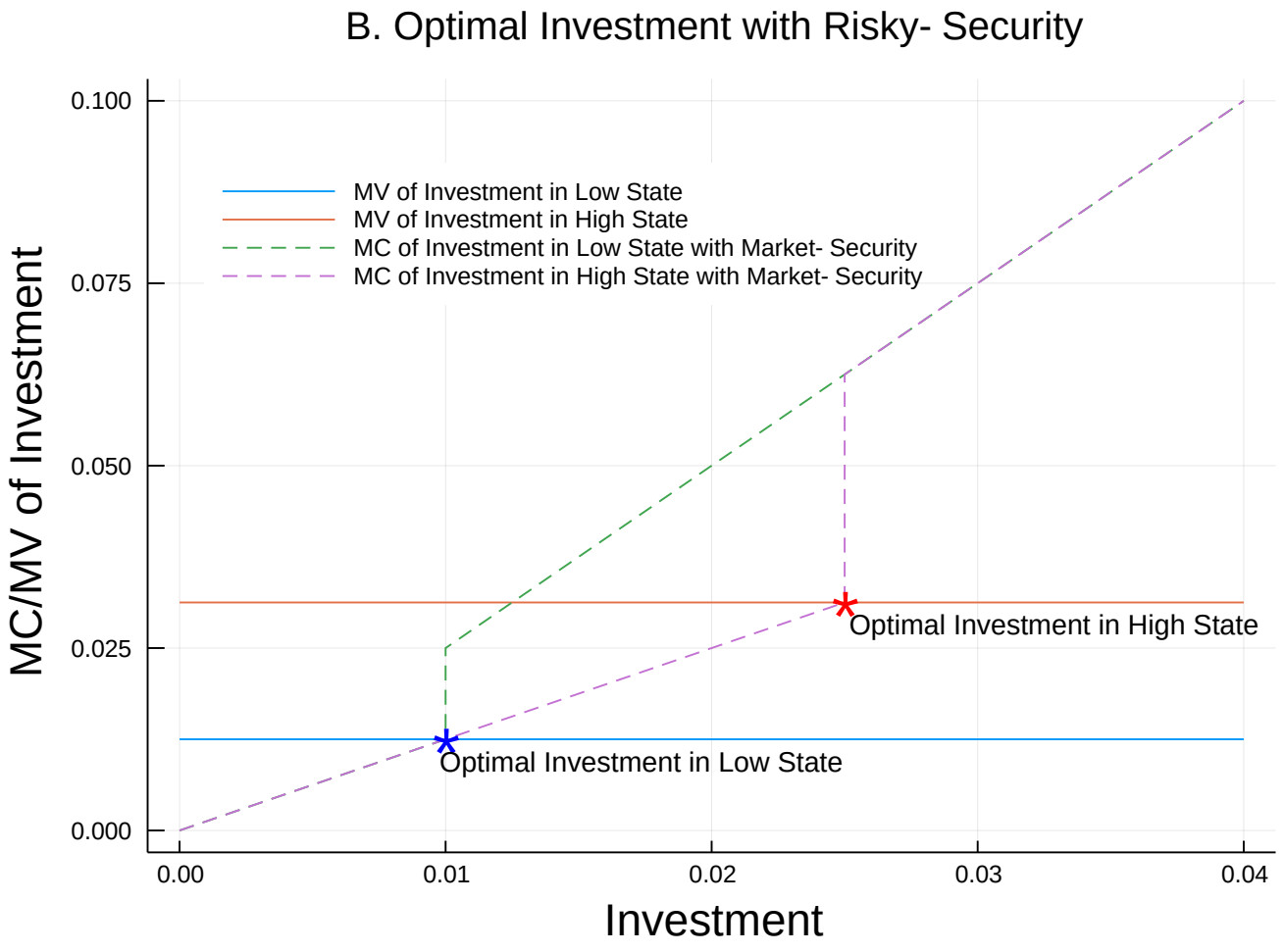


Calibration

Table: Parameter Choices

Parameter	Value	Description	Source
ρ_x	0.95^4	Persistence of x	KP (1982)
σ_x	$0.0248\sqrt{\frac{1+\rho_x}{2}}$	Conditional Standard Deviation of x	Savov (2011)
η	0.95	Time Preference	Savov (2011)
γ_0	9.0	Risk Averse Parameter	Savov (2011)
γ_1	$-\gamma_0/\rho_x$	Risk Averse Parameter	Calibrated
β_π	1.0	Cyclical Intensity of Profits	Standardized
τ	0.20	Tax Rate	NW (2014)
δ	0.15	Depreciation Rate	RW (2009)
ρ_z	0.66	Persistence of z	RW (2009)
σ_z	0.121	Conditional Standard Deviation of z	RW (2009)
f	0.82	Operation Costs	Calibrated
ψ_i	1.281	Quadratic Capital Adjustment Costs	Calibrated
ψ_a	0.0015	Costs of Holding Market-Security	Calibrated
λ_1	0.10	Linear External Financing Costs	BLY(2018)

Empirical Predictions

- Investment/Dividend Cash Holding Sensitivity:
  - Regression analysis of following models on simulated data

$$i_{jt} = \theta_1^i \textit{risky assets}_{jt-1} + \theta_2^i \textit{safe assets}_{jt-1} + \theta_3^i q_{jt-1} + \mu_j + \mu_t + \varepsilon_{jt}$$
$$e_{jt} = \theta_1^e \textit{risky assets}_{jt-1} + \theta_2^e \textit{safe assets}_{jt-1} + \theta_3^e q_{jt-1} + \mu_j + \mu_t + \varepsilon_{jt}$$

i_{jt}	investment rate
e_{jt}	equity payout rate
$\textit{risky assets}_{jt}$	$sc\left[1 + r_M(x^-, x)\right]$
$\textit{safe assets}_{jt}$	$(1-s)c\left[1 + r_f(x^-)\right]$
q_{jt}	Tobin's q

Empirical Predictions

Table: Investment/Dividend Cash Holding Sensitivity — Simulated Sample

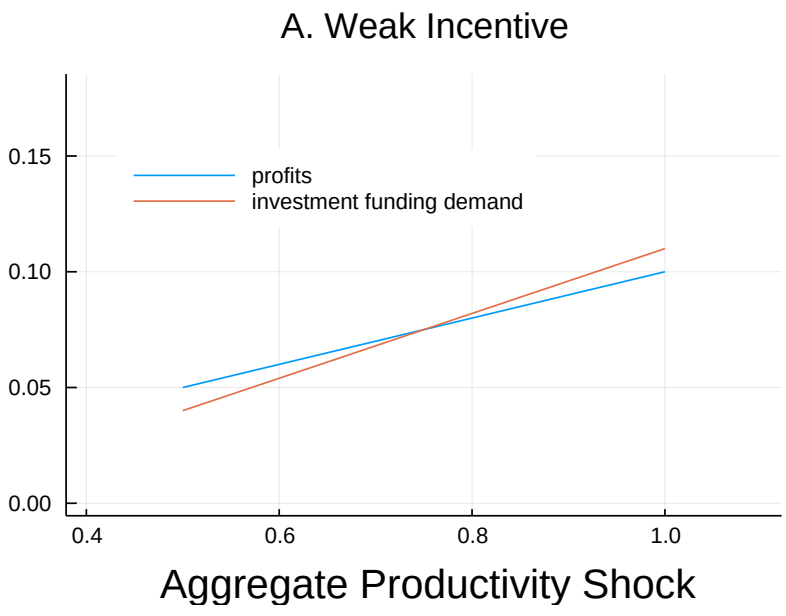
	Investment	Equity Payout
lagged risky assets	0.0802	0.1129
	(0.0007)	(0.0019)
lagged safe assets	0.0525	0.1370
	(0.0004)	(0.0011)
lagged Tobin's q	0.4097	-0.1356
	(0.0002)	(0.0004)
Year FEs	Yes	Yes
Firm FEs	Yes	Yes

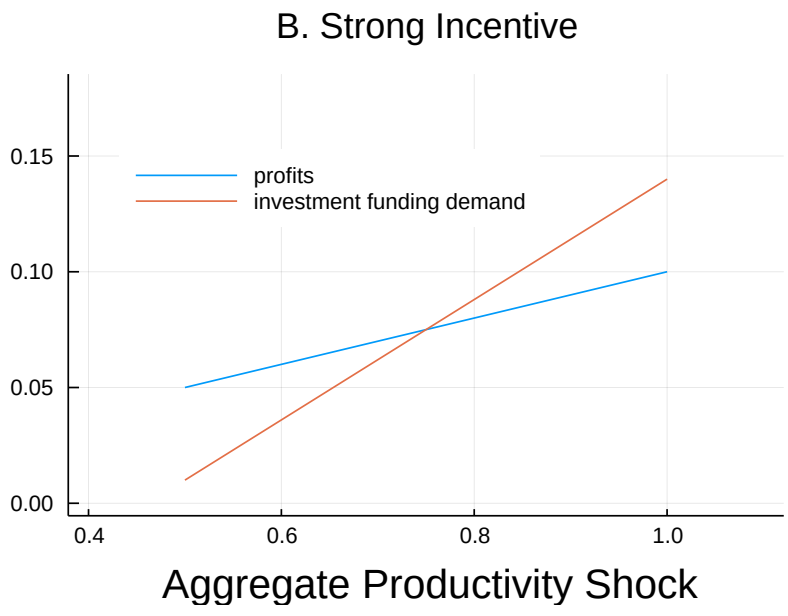
Empirical Predictions

- Investment/Dividend Cash Holding Sensitivity
  - Hypothesis 1: the fair value of risky financial assets is positively correlated with investment rate controlling for safe assets and investment opportunity ($\theta_1^i > 0$).
  - Hypothesis 2: the fair value of risky financial assets is positively correlated with equity payout controlling for safe assets and investment opportunity ($\theta_1^e > 0$).

Empirical Predictions

- Firm Heterogeneity and Saving Behavior





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  - Comparative statics along β_π (the cyclical intensity of profits) and λ_1 (external financing costs)
  - For each value of β_π or λ_1, solve the model, simulate an artificial panel of 3,000 firms over 50 years and estimate following regressions

$$\text{funding gap}_{jt} = \frac{1}{1+\psi_i} q_{jt-1} - (1-\tau)\pi_{jt-1}$$

$$\text{funding gap}_{jt} = \beta_j^F r_{Mt-1} + \mu_j + \varepsilon_{jt}$$

where r_{Mt-1} is the return on the market-security from period $t-2$ to period $t-1$, q_{jt-1} is Tobin's q at the end of period $t-1$, $(1-\tau)\pi_{jt-1}$ is the net-tax profits of the firm.

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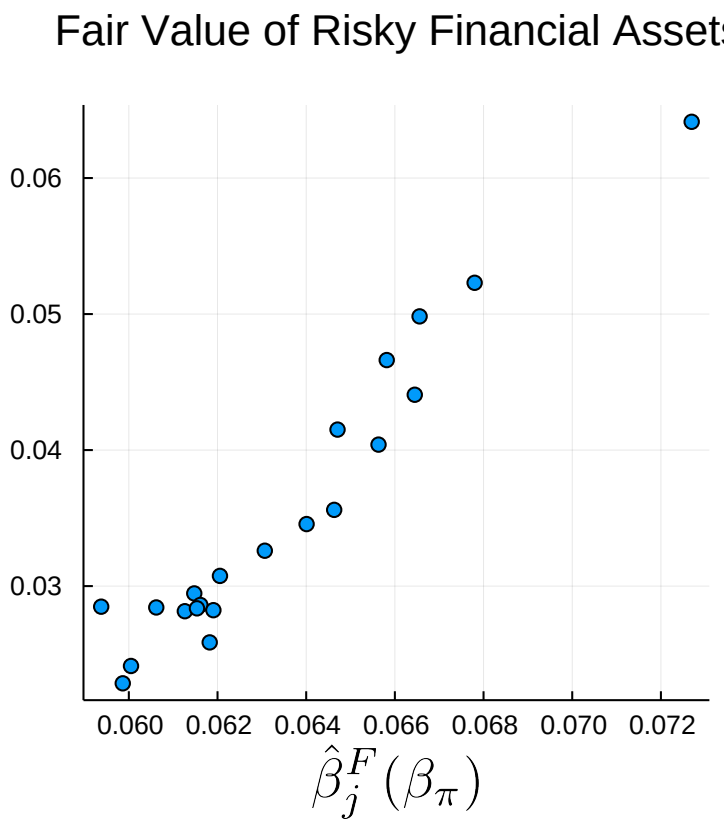
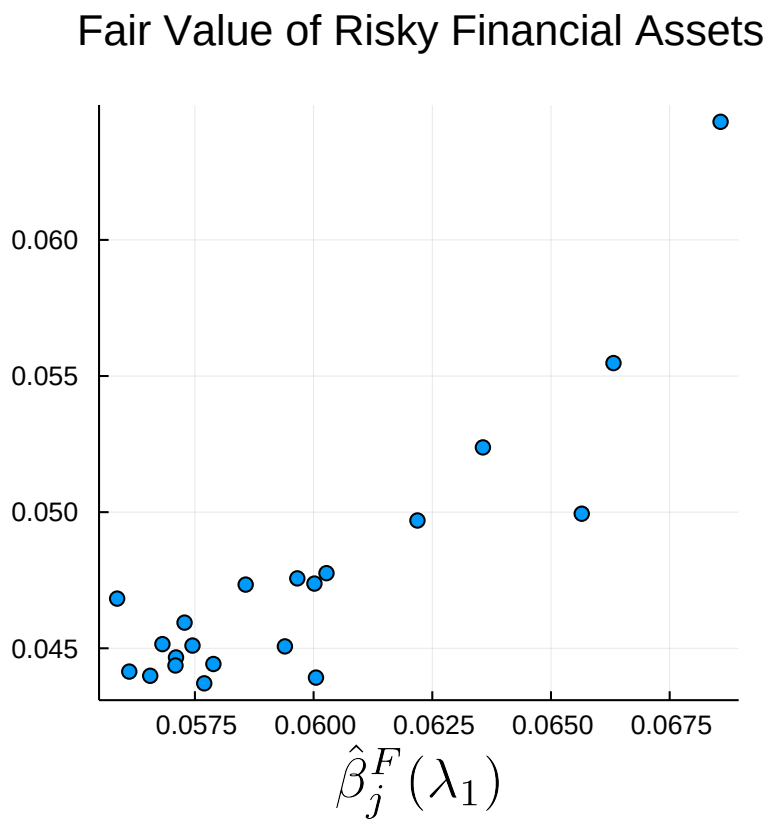
  - Funding gap beta ($\hat{\beta}_j^F$), as the empirical measure of the incentive to invest in risky financial assets.

Empirical Predictions





Empirical Predictions

- Firm Heterogeneity and Saving Behavior
  - Hypothesis 3: Firms with high funding gap beta (large β_j^F) hold more risky financial assets controlling for external financing costs.
  - Hypothesis 4: Firms with high external financing costs (large λ_1) hold more risky financial assets controlling for funding gap beta.

Data

- The fair value of risky financial assets (fiscal year 2009-2018)
  - firm-year observations scraped from SEC 10-K filings through a machine learning algorithm
  - Out of sample overall accuracy rate: 83.93% for a random selected sample with 112 observations
- Compustat annual data (1980-2018)
- Producer Price Index from BLS
- Real GDP chained 2009 dollars from BEA
- Bloomberg-Barclays U.S. Aggregate Bond Index
- Compustat quarterly data (1999-2018) for estimation of funding gap beta

3. FAIR VALUE MEASUREMENTS

The carrying amounts of our financial instruments, including cash and cash equivalents, restricted cash, accounts receivable, accounts payable and accrued liabilities, approximate fair value because of their short maturities.

We follow a three-level fair value hierarchy that prioritizes the inputs used to measure fair value. This hierarchy requires entities to maximize the use of "observable inputs" and minimize the use of "unobservable inputs." The three levels of inputs used to measure fair value are as follows:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs other than quoted prices included in Level 1, such as quoted prices for markets that are not active or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. This includes certain pricing models, discounted cash flow methodologies and similar techniques that use significant unobservable inputs.

The table below segregates all assets that are measured at fair value on a recurring basis (which is measured at least annually) into the most appropriate level within the fair value hierarchy based on the inputs used to determine the fair value at the measurement date.

	March 31, 2018	Quoted prices in active markets for identical assets (level 1)	Significant other observable inputs (level 2)	Significant unobservable inputs (level 3)	Balance Sheet Classification
Money market funds	$ 516,626	$ 516,626	$ —	$ —	Cash and cash equivalents
Bank-time deposits	21	21	—	—	Cash and cash equivalents
Commercial paper	10,796	—	10,796	—	Cash and cash equivalents
Corporate bonds	308,716	—	308,716	—	Short-term investments
US Treasuries	59,725	59,725	—	—	Short-term investments
Commercial paper	25,422	—	25,422	—	Short-term investments
Mutual funds	4,880	—	4,880	—	Short-term investments
Bank-time deposits	216,663	216,663	—	—	Short-term investments
Foreign currency forward contracts	12	—	12	—	Prepaid expenses and other
Foreign currency forward contracts	(43)	—	(43)	—	Accrued and other current liabilities
Cross-currency swap	(15,659)	—	(15,659)	—	Accrued and other current liabilities
Private equity	1,205	—	—	1,205	Other assets
Total recurring fair value measurements, net	$ 1,128,364	$ 793,035	$ 334,124	$ 1,205	

Data

Table: Summary Statistics of Key Variables

	N	mean	sd	min	max
investment	20851	.138	.16	.001	1.35
rd	20873	.398	.999	0	8.956
dividend	19287	-.168	1.402	-14.113	2.648
tex	20851	.541	1.063	.002	9.33
risky financial assets	20726	.353	1.262	0	13.656
safe assets	20728	.97	2.033	0	20.257
lagged risky assets	20719	.29	1.024	0	10.535
lagged safe assets	20742	.856	1.702	0	16.156
lagged Tobin's q	18717	6.754	14.242	-3.323	132.972

Hypothesis 1 and Hypothesis 2

- Regression specification

$$y_{jt} = \theta_1 \textit{risky assets}_{jt-1} + \theta_2 \textit{safe assets}_{jt-1} + \theta_3 q_{jt-1} + \mu_j + \mu_t + \varepsilon_{jt},$$

  - y_{jt} investment rate, R&D expenditure rate, dividend rate, or total expenditure rate
  - $\textit{risky assets}_{jt}$ the fair value of risky financial assets over PPEGT
  - $\textit{safe assets}_{jt}$ cash over PPEGT
  - q_{jt} Tobin's q

Hypothesis 1 and Hypothesis 2

Table: Investment, Dividend and Savings

VARIABLES	(1) investment	(2) rd	(3) dividend	(4) tex
lagged risky assets	0.0081***	0.0861***	0.0621*	0.0951***
	(0.0017)	(0.0276)	(0.0333)	(0.0268)
lagged safe assets	0.0169***	0.1060***	0.0860***	0.1265***
	(0.0038)	(0.0195)	(0.0217)	(0.0153)
lagged Tobin's q	0.0036***	0.0141***	-0.0115***	0.0174***
	(0.0003)	(0.0030)	(0.0022)	(0.0025)
lagged size	-0.0125**	0.0073	0.3207***	-0.0130
	(0.0055)	(0.0176)	(0.0591)	(0.0212)
Constant	0.1733***	0.1152	-2.2514***	0.3430**
	(0.0350)	(0.1533)	(0.3886)	(0.1700)
Observations	18,176	18,193	16,777	18,176
R-squared	0.107	0.298	0.0365	0.327
Year FEs	Y	Y	Y	Y
Firm FEs	Y	Y	Y	Y

Hypothesis 3 and Hypothesis 4

- Fama-MacBeth cross-sectional regression specification

$$risky\ assets_{jt} = \gamma_t^{\beta}\hat{\beta}_j^F + \gamma_t^{FCH} FCH_{jt-1} + \gamma_t^{FCL}(FCL_{jt-1} + FCH_{jt-1}) + \mu_{sic} + \varepsilon_{jt}$$

where $\hat{\beta}_j^F$'s are estimated from following first-stage model

$$funding\ gap_{jt} = \mu_j + \beta_j^F r_{Mt-1} + \varepsilon_{jt}$$

  - $risky\ assets_{jt}$ the fair value of risky financial assets over PPEGT
  - $\hat{\beta}_j^F$ funding gap beta
  - FCH_{jt} financing constrained dummy
  - FCL_{jt} financing unconstrained dummy

Hypothesis 3 and Hypothesis 4

Table: Saving Behavior — Dividend Payments As Financing Constraints

Panel A. Coefficients on Funding Gap Beta						
Year						
2009	0.0538	0.0471	0.0473	0.0336	0.0307	0.0309
2010	0.0614	0.0588	0.0454	0.0316	0.0342	0.0313
2011	0.0725	0.0659	0.0586	0.0591	0.0598	0.0608
2012	0.0548	0.0532	0.0538	0.0573	0.0573	0.0539
2013	0.0540	0.0516	0.0429	0.0341	0.0513	0.0328
2014	0.0649	0.0637	0.0524	0.0436	0.0568	0.0413
2015	0.0781	0.0775	0.0703	0.0629	0.0722	0.0604
2016	0.0434	0.0381	0.0308	0.0306	0.0296	0.0225
2017	0.0179	0.0163	0.0125	0.0154	0.0146	0.0162
2018	0.0331	0.0264	0.0251	0.0199	0.0063	0.0057
$\hat{\gamma}^{\beta}$	0.0534	0.0498	0.0439	0.0388	0.0413	0.0356
SE($\hat{\gamma}^{\beta}$)	0.0054	0.0056	0.0051	0.0049	0.0064	0.0056
Investment Measure	*i*	*rd*	*tex*	*i*	*rd*	*tex*
q-Theory Investment Measure	Y	Y	Y	N	N	N
Industry FEs	Y	Y	Y	Y	Y	Y

- One unit increase in β_j^F: 3 - 5% increase in risky financial assets

Hypothesis 3 and Hypothesis 4

Table: Saving Behavior — Dividend Payments As Financing Constraints

Panel B. Coefficients on Financing Constraint Dummy						
Year						
2009	0.0899	0.0867	0.0924	0.0870	0.0811	0.0844
2010	0.0512	0.0471	0.0562	0.0493	0.0411	0.0455
2011	0.0175	0.0141	0.0221	0.0094	0.0011	0.0009
2012	0.0390	0.0390	0.0406	0.0290	0.0240	0.0216
2013	0.0916	0.0864	0.0942	0.0923	0.0767	0.0897
2014	0.0786	0.0724	0.0838	0.0794	0.0702	0.0807
2015	0.0744	0.0642	0.0778	0.0725	0.0588	0.0695
2016	0.0329	0.0341	0.0383	0.0348	0.0353	0.0397
2017	0.1291	0.1235	0.1316	0.1276	0.1228	0.1260
2018	0.1566	0.1595	0.1581	0.1617	0.1740	0.1736
$\hat{\gamma}^{FCH}$	0.0761	0.0727	0.0795	0.0743	0.0685	0.0732
SE($\hat{\gamma}^{FCH}$)	0.0130	0.0131	0.0128	0.0139	0.0151	0.0152
Investment Measure	*i*	*rd*	*tex*	*i*	*rd*	*tex*
q-Theory Investment Measure	Y	Y	Y	N	N	N
Industry FEs	Y	Y	Y	Y	Y	Y

- Financially constrained firms: 6 - 8% more risky financial assets

Robustness Checks

- Robustness Checks
  - Other financing constraint indices
  - Control variables by Bates et al. (2009); Duchin et al. (2017)
  - Peters and Taylor (2017)'s total q

Endogeneity Concerns — Measurement Errors

- Regression Specification

$$y_{jt} = \theta_1 \textit{risky assets}^*_{jt-1} + \theta_2 \textit{safe assets}_{jt-1} + \theta_3 q^*_{jt-1} + \mu_j + \mu_t + \varepsilon_{jt},$$

where both *risky assets* and q contain measurement errors

$$\begin{aligned} \textit{risky assets}_{jt-1} &= \textit{risky assets}^*_{jt-1} + \varepsilon^{rf}_{jt-1} \\ q_{jt-1} &= q^*_{jt-1} + \varepsilon^{q}_{jt-1}. \end{aligned}$$

- y_{jt} investment rate, R&D expenditure rate, dividend rate, or total expenditure rate
- $\textit{risky assets}_{jt}$ the fair value of risky financial assets over PPEGT
- $\textit{safe assets}_{jt}$ cash over PPEGT
- q_{jt} Tobin's q

Endogeneity Concerns — Measurement Errors

Table: Investment, Dividend and Savings — Measurement Errors

VARIABLES	(1) investment	(2) rd	(3) dividend	(4) tex
lagged risky financial assets	0.0044	0.0759	0.1365	0.0679
	(0.0096)	(0.0699)	(0.4842)	(0.0758)
lagged Tobin's q	0.0058***	0.0468***	-0.1398***	0.0542***
	(0.0010)	(0.0172)	(0.0402)	(0.0174)
lagged safe assets	0.0200***	0.0087	0.3907***	0.0303
	(0.0065)	(0.0313)	(0.0830)	(0.0368)
lagged size	-0.0662***	-0.0473*	1.1439***	-0.1237***
	(0.0094)	(0.0258)	(0.2299)	(0.0247)
Constant	0.0129**	-0.0607***	0.1295***	-0.0512**
	(0.0059)	(0.0210)	(0.0392)	(0.0223)
Observations	13,263	13,281	12,016	13,263
Kleibergen-Paap F	60.1643	60.0585	65.8374	60.1643
Year FEs	Y	Y	Y	Y
Firm FEs	Y	Y	Y	Y

Endogeneity Concerns — Omitted Variables

- Fama-MacBeth cross-sectional regression specification

$$\begin{aligned} risky\ assets_{jt} =& \gamma_t^{\beta} \hat{\beta}_j^F + \gamma_t^{FCH} FCH_{jt-1} + \gamma_t^{FCL}(FCL_{jt-1} + FCH_{jt-1}) \\ &+ CG + RS + OC + controls + \mu_{sic} + \varepsilon_{jt} \end{aligned}$$

  - $risky\ assets_{jt}$ the fair value of risky financial assets over PPEGT
  - $\hat{\beta}_j^F$ funding gap beta
  - FCH_{jt} financing constrained dummy
  - FCL_{jt} financing unconstrained dummy
  - CG control variables for corporate governance
  - RS control variables for CEO risk-seeking
  - OC control variables for CEO overconfidence

Endogeneity Concerns

Table: Saving Behavior — Governance, Risk-Seeking and Overconfidence

Panel A. Non-Dividend Payer as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.1016	0.1126	0.1182	0.1145	0.0893	0.0912
SE($\hat{\gamma}^{\beta}$)	0.0239	0.0260	0.0257	0.0236	0.0254	0.0224
Panel B. Credit Rating as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.1023	0.1135	0.1190	0.1148	0.0895	0.0909
SE($\hat{\gamma}^{\beta}$)	0.0251	0.0275	0.0271	0.0248	0.0267	0.0237
Panel C. KZ Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.1071	0.1169	0.1221	0.1167	0.0939	0.0929
SE($\hat{\gamma}^{\beta}$)	0.0270	0.0289	0.0287	0.0249	0.0289	0.0241
Panel D. WW Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.1010	0.1121	0.1174	0.1124	0.0879	0.0888
SE($\hat{\gamma}^{\beta}$)	0.0253	0.0273	0.0269	0.0245	0.0258	0.0225
Panel E. HP Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.1037	0.1135	0.1192	0.1189	0.0884	0.0910
SE($\hat{\gamma}^{\beta}$)	0.0253	0.0275	0.0269	0.0252	0.0270	0.0240
Investment Measure	*i*	*rd*	*tex*	*i*	*rd*	*tex*
q-Theory Investment Measure	Y	Y	Y	N	N	N
Controls	Y	Y	Y	Y	Y	Y
Industry FEs	Y	Y	Y	Y	Y	Y

Conclusion

- Theoretically
  - Due to uncertainty and firm heterogeneity, firm's investment funding demand is unlikely to be perfectly correlated with internal profits
  - Risk-free assets is unlikely to be the perfect instrument in corporate liquidity management
  - Risky financial assets with state-contingent returns can be more valuable than risk-free assets
- Empirically
  - Time-serially, the value of risky financial assets is positively correlated with investment and dividend rates
  - Cross-sectionally, firms with more pro-cyclical funding gap invest more in risky financial assets

Table: Saving Behavior — Other Financing Constraint Indices

Panel A. Credit Rating as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0537	0.0501	0.0441	0.0391	0.0415	0.0358
SE($\hat{\gamma}^{\beta}$)	0.0052	0.0054	0.0049	0.0047	0.0061	0.0053
$\hat{\gamma}^{FCH}$	0.1010	0.0964	0.1024	0.1013	0.0935	0.0992
SE($\hat{\gamma}^{FCH}$)	0.0143	0.0137	0.0144	0.0147	0.0137	0.0148
Panel B. KZ Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0514	0.0476	0.0416	0.0366	0.0380	0.0326
SE($\hat{\gamma}^{\beta}$)	0.0072	0.0071	0.0065	0.0063	0.0075	0.0066
$\hat{\gamma}^{FCH}$	-0.4439	-0.4449	-0.4463	-0.4451	-0.4429	-0.4425
SE($\hat{\gamma}^{FCH}$)	0.0495	0.0497	0.0495	0.0505	0.0512	0.0518
Panel C. WW Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0592	0.0541	0.0481	0.0449	0.0451	0.0401
SE($\hat{\gamma}^{\beta}$)	0.0080	0.0081	0.0073	0.0068	0.0089	0.0075
$\hat{\gamma}^{FCH}$	-0.1528	-0.1533	-0.1460	-0.1461	-0.1539	-0.1475
SE($\hat{\gamma}^{FCH}$)	0.0350	0.0353	0.0352	0.0338	0.0309	0.0315
Panel D. HP Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0536	0.0500	0.0441	0.0395	0.0412	0.0357
SE($\hat{\gamma}^{\beta}$)	0.0054	0.0056	0.0052	0.0051	0.0065	0.0057
$\hat{\gamma}^{FCH}$	0.3727	0.3695	0.3733	0.3771	0.3625	0.3698
SE($\hat{\gamma}^{FCH}$)	0.0649	0.0652	0.0656	0.0669	0.0676	0.0677
Investment Measure	*i*	*rd*	*tex*	*i*	*rd*	*tex*
q-Theory Investment Measure	Y	Y	Y	N	N	N
Industry FEs	Y	Y	Y	Y	Y	Y

Main

Table: Investment, Dividend and Savings — Control Variables

VARIABLES	(1) investment	(2) rd	(3) dividend	(4) tex
lagged risky assets	0.0120***	0.0942***	0.0715**	0.1074***
	(0.0018)	(0.0297)	(0.0313)	(0.0294)
lagged safe assets	0.0187***	0.0929***	0.1112***	0.1155***
	(0.0039)	(0.0139)	(0.0207)	(0.0111)
lagged Tobin's q	0.0027***	0.0165***	-0.0077***	0.0187***
	(0.0003)	(0.0028)	(0.0028)	(0.0025)
lagged size	-0.0155***	0.0012	0.2885***	-0.0209
	(0.0058)	(0.0143)	(0.0496)	(0.0175)
Constant	0.1710***	0.1784	-1.8720***	0.3970***
	(0.0400)	(0.1104)	(0.2850)	(0.1271)
Observations	16,077	16,089	14,838	16,077
R-squared	0.163	0.299	0.0497	0.326
Controls	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Firm FEs	Y	Y	Y	Y

Table: Saving Behavior — Control Variables

Panel A. Non-Dividend Payer as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0473	0.0471	0.0402	0.0336	0.0381	0.0326
SE($\hat{\gamma}^{\beta}$)	0.0054	0.0054	0.0045	0.0054	0.0068	0.0062
$\hat{\gamma}^{FCH}$	0.0815	0.0775	0.0814	0.0762	0.0771	0.0761
SE($\hat{\gamma}^{FCH}$)	0.0169	0.0168	0.0167	0.0180	0.0181	0.0184
Panel B. Credit Rating as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0482	0.0480	0.0409	0.0344	0.0390	0.0333
SE($\hat{\gamma}^{\beta}$)	0.0053	0.0052	0.0043	0.0052	0.0066	0.0060
$\hat{\gamma}^{FCH}$	0.1668	0.1636	0.1653	0.1614	0.1630	0.1626
SE($\hat{\gamma}^{FCH}$)	0.0148	0.0140	0.0153	0.0155	0.0144	0.0158
Panel C. KZ Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0438	0.0444	0.0370	0.0306	0.0348	0.0293
SE($\hat{\gamma}^{\beta}$)	0.0073	0.0071	0.0061	0.0065	0.0081	0.0072
$\hat{\gamma}^{FCH}$	-0.4812	-0.4702	-0.4832	-0.4863	-0.4723	-0.4856
SE($\hat{\gamma}^{FCH}$)	0.0679	0.0681	0.0671	0.0682	0.0703	0.0699
Panel D. WW Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0461	0.0455	0.0382	0.0339	0.0373	0.0328
SE($\hat{\gamma}^{\beta}$)	0.0086	0.0088	0.0074	0.0075	0.0100	0.0084
$\hat{\gamma}^{FCH}$	-0.1927	-0.1946	-0.1889	-0.1912	-0.1953	-0.1897
SE($\hat{\gamma}^{FCH}$)	0.0989	0.0985	0.0993	0.0981	0.0965	0.0974
Panel E. HP Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0490	0.0487	0.0415	0.0350	0.0386	0.0330
SE($\hat{\gamma}^{\beta}$)	0.0055	0.0055	0.0047	0.0056	0.0070	0.0064
$\hat{\gamma}^{FCH}$	0.4081	0.4030	0.4053	0.4037	0.3914	0.3962
SE($\hat{\gamma}^{FCH}$)	0.0685	0.0686	0.0692	0.0718	0.0713	0.0726
Investment Measure	*i*	*rd*	*tex*	*i*	*rd*	*tex*
q-Theory Investment Measure	Y	Y	Y	N	N	N
Controls	Y	Y	Y	Y	Y	Y
Industry FEs	Y	Y	Y	Y	Y	Y

Main

Table: Investment, Dividend and Savings — Peters and Taylor (2017)'s Total q

VARIABLES	(1) investment	(2) rd	(3) dividend	(4) tex
lagged risky assets	0.0121**	0.0334***	0.0494**	0.0562***
	(0.0055)	(0.0095)	(0.0228)	(0.0143)
lagged safe assets	0.0429***	0.0309***	0.0706***	0.1258***
	(0.0081)	(0.0046)	(0.0186)	(0.0112)
lagged Tobin's q	0.0089***	0.0051***	-0.0075	0.0219***
	(0.0018)	(0.0009)	(0.0064)	(0.0020)
lagged size	-0.0108***	0.0030	0.0660***	-0.0210***
	(0.0027)	(0.0023)	(0.0070)	(0.0035)
Constant	0.1003***	0.0074	-0.4227***	0.2440***
	(0.0183)	(0.0147)	(0.0461)	(0.0236)
Observations	14,925	14,937	13,775	14,925
R-squared	0.145	0.171	0.0681	0.255
Controls	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Firm FEs	Y	Y	Y	Y

Table: Saving Behavior — Peters and Taylor (2017)'s Total q

Panel A. Non-Dividend Payer as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0230	0.0231	0.0240	0.0149	0.0199	0.0171
SE($\hat{\gamma}^{\beta}$)	0.0052	0.0050	0.0050	0.0033	0.0043	0.0026
$\hat{\gamma}^{FCH}$	0.0032	0.0032	0.0036	0.0027	0.0033	0.0025
SE($\hat{\gamma}^{FCH}$)	0.0013	0.0013	0.0013	0.0014	0.0012	0.0014
Panel B. Credit Rating as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0238	0.0242	0.0245	0.0152	0.0205	0.0172
SE($\hat{\gamma}^{\beta}$)	0.0051	0.0049	0.0050	0.0032	0.0042	0.0026
$\hat{\gamma}^{FCH}$	0.0243	0.0241	0.0242	0.0238	0.0236	0.0236
SE($\hat{\gamma}^{FCH}$)	0.0032	0.0032	0.0033	0.0033	0.0032	0.0033
Panel C. KZ Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0242	0.0260	0.0237	0.0157	0.0219	0.0168
SE($\hat{\gamma}^{\beta}$)	0.0055	0.0057	0.0055	0.0033	0.0047	0.0026
$\hat{\gamma}^{FCH}$	-0.0472	-0.0466	-0.0469	-0.0467	-0.0465	-0.0464
SE($\hat{\gamma}^{FCH}$)	0.0084	0.0082	0.0084	0.0083	0.0082	0.0083
Panel D. WW Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0226	0.0223	0.0237	0.0143	0.0190	0.0167
SE($\hat{\gamma}^{\beta}$)	0.0055	0.0053	0.0054	0.0035	0.0045	0.0028
$\hat{\gamma}^{FCH}$	-0.0207	-0.0206	-0.0206	-0.0204	-0.0199	-0.0207
SE($\hat{\gamma}^{FCH}$)	0.0081	0.0080	0.0082	0.0082	0.0080	0.0082
Panel E. HP Index as Financing Constraint Index						
$\hat{\gamma}^{\beta}$	0.0276	0.0282	0.0273	0.0180	0.0240	0.0189
SE($\hat{\gamma}^{\beta}$)	0.0056	0.0054	0.0055	0.0036	0.0046	0.0029
$\hat{\gamma}^{FCH}$	0.0428	0.0450	0.0422	0.0410	0.0442	0.0409
SE($\hat{\gamma}^{FCH}$)	0.0108	0.0113	0.0106	0.0111	0.0114	0.0107
Investment Measure	i	rd	tex	i	rd	tex
q-Theory Investment Measure	Y	Y	Y	N	N	N
Controls	Y	Y	Y	Y	Y	Y
Industry FEs	Y	Y	Y	Y	Y	Y

Main