

Asymmetric Investment Rates

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What?

Contributions

How to measure the firm-level (fixed) investment rate?

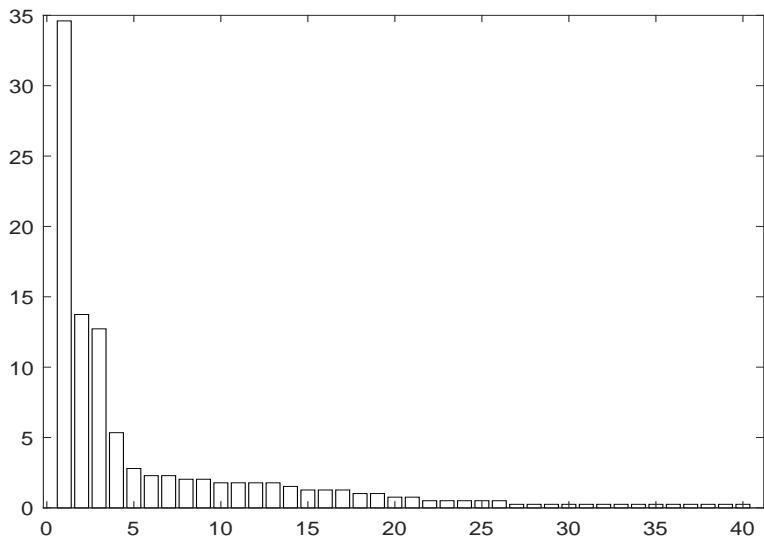
- Building the data infrastructure of **firm-specific current-cost capital stocks for the entire Compustat universe**

What are the basic properties of the firm-level investment rate?

- Characterizing accurately the key properties, including its **asymmetry** and **lumpiness**

Why?

A meta-study of top-five finance journals from 2000 onward:
347 articles with 393 appearances of 40 investment rates



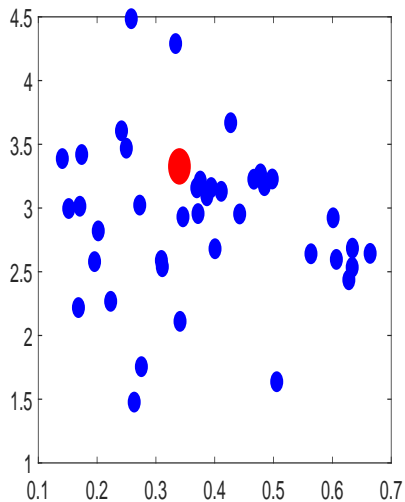
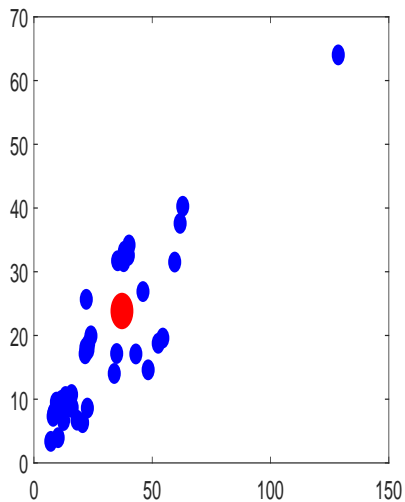
Why?

The list of the 40 investment rates

- | | |
|-------------------------|---|
| (1) CAPX/AT | (21) dBe/Be |
| (2) CAPX/PPENT | (22) (CAPX-SPPE)/avePPENT |
| (3) dAT/AT | (23) dNoa/AT |
| (4) (dPPEGT+dINVT)/AT | (24) dLno/aveAT |
| (5) Inv/AT | (25) dNca/AT |
| (6) CAPX/PPEGT | (26) dBe/AT |
| (7) dPPEGT/AT | (27) (CAPXV+AQC)/PPENT |
| (8) (dPPENT+DP)/PPENT | (28) CAPXV/PPENT |
| (9) (CAPX-SPPE)/PPEGT | (29) CAPXV/PPEGT |
| (10) (CAPX-SPPE)/AT | (30) (CAPX+IVCH-SIV)/(PPENT+IVAEQ+IVAO) |
| (11) dPPENT/AT | (31) (dPPENT+WDP+DPC)/PPEGT |
| (12) (CAPX+AQC)/AT | (32) dNAT/NAT |
| (13) CAPXV/AT | (33) CAPX/(AT-INVT) |
| (14) (CAPX-SPPE)/PPENT | (34) (CAPX+AQC)/PPEGT |
| (15) (CAPX+AQC-SPPE)/AT | (35) CAPX/(PPENT-CAPX+DP) |
| (16) (CAPXV-SPPE)/AT | (36) (CAPXV-SPPE)/(AT-ACT) |
| (17) dPPEGT/PPEGT | (37) (CAPXV-SPPE)/PPENT |
| (18) dPPENT/PPENT | (38) (CAPX-DP)/AT |
| (19) (dPPENT+DP)/AT | (39) CAPX/(AT-CHE) |
| (20) (CAPXV-SPPE)/PPEGT | (40) dNCAT/NCAT |

Why?

Mean versus std; skewness versus ρ_1 across the 40 investment rates, 1963–2020



How?

Firm-specific current-cost capital stocks for the entire Compustat universe

Investment as $dPPENT + DP$ (Hayashi and Inoue 1991)

BEA's industry-specific capital and investment price deflators assigned to firms via a meticulous Compustat firm-NAICS mapping

BEA's industry economic depreciation rates assigned to firms

Initial current-cost capital stocks based on PPEGT and asset age via perpetual inventory method (PIM)

How?

Another meta-study on prior 33 firm-level PIM studies;
only 10 from 2000 onward in the top-five finance journals

Mostly small samples with only manufacturing firms

Investment mostly as capital expenditure

Mostly a single, aggregate capital price deflator

Many use the Salinger-Summers double-declining method for δ

How?

Prior 33 firm-level PIM studies

	Sample	Investment flows	Price deflators	Depreciation rates
Lindenberg and Ross (1981)	246 firms, 1960–1977	“gross investment (book) in plant and equipment”	Nonresidential fixed investment price deflator	Accounting depreciation, also tech. progress
Salinger and Summers (1983)	30 Dow Jones companies, 1959–1978	proportional to aggregate investment and aligned with gross PPE in 1959	CPI	double declining
Smirlock, Gilligan, and Marshall (1984)	231 manuf. firms,	change in gross PPE	GNP implicit price deflator	5%
Fazzari, Hubbard, and Petersen (1988)	Manuf. firms, 1970–198, Value Line	“capital spending”	Implicit price deflator for fixed nonresid. investment	single declining
Hall (1990)	Compustat, 1979–1987		GNP deflator for fixed nonresidential investment	Accounting depreciation rate
Hoshi and Kashyap (1990)	580 Japanese manuf. firms	change in net PPE plus depreciation	the wholesale price index for investment goods	constant δ , average exponential rate, or $1 - \alpha^{1/\text{average life}}$
Hayashi and Inoue (1991)	687 Japanese manuf. firms, 1977–1986	change in net PPE plus accounting depreciation	nonresid. buildings and structures as the construction material part of Wholesale Price Index (WPI) from BoJ; machinery and instruments and tools as weighted averages of subcomponents in WPI; transportation equipment as the matching component of WPI; the urban land prices index	4.7% for nonresid. buildings; 5.64% for structures; 9.489% for machinery; 14.7% for transportation equipments; 8.838% for instruments and tools; 0% for land

How?

Prior 33 firm-level PIM studies

	Sample	Investment flows	Price deflators	Depreciation rates
Blundell, Bond, and Devereux (1992)	532 U.K. manuf. firms, Datastream	total new fixed assets	implicit price deflator for gross fixed investment by manuf. industry	8.19% for plant and machinery; 2.5% for buildings
Whited (1992)	325 manuf. firms, 1972–1986	capital expenditure on PPE	GNP price deflator for nonresid. investment	double declining
Lang and Stulz (1994)	1,449 Compustat firms in 1984	change in gross PPE	implicit GNP price deflator	5%
Bond and Meghir (1994)	626 U.K. manuf. firms, Datastream	total new fixed assets	implicit price deflator for gross fixed investment by manuf. industry	8.19% for plant and machinery; 2.5% for land and buildings
Hubbard, Kashyap, and Whited (1995)	428 manuf. firms, 1976–1987	capital expenditure on PPE	GNP price deflator for nonresid. investment	double declining
Leahy and Whited (1996)	772 manuf. firms, 1981–1987	capital expenditure on PPE	GNP price deflator for nonresid. investment	double declining
Eberly (1997)	Global Vantage industrial database, 1981–1994	capital expenditure	implicit price deflator for nonresid. investment/producer price index	2-digit SIC-industry, double declining
Lewellen and Badrinath (1997)	678 firms, 1975–1991	change in PPENT plus accounting depreciation	GNP deflator for fixed nonresid. investment	straight-line depreciation
Barnett and Sakellaris (1998)	manuf. firms from Hall (1990)	capital expenditure on PPE	GNP deflator for fixed nonresid. investment	accounting depreciation rate
Erickson and Whited (2000)	737 manuf. firms, 1992–1995	capital expenditure on PPE	nonresid. investment price deflator	double declining
Abel and Eberly (2001)	Compustat, 604 firms on average per year, 1974–1993	capital expenditure on PPE minus sales of PPE	implicit price deflator for nonresid. investment	2-digit SIC-industry, double declining

How?

Prior 33 firm-level PIM studies

	Sample	Investment flows	Price deflators	Depreciation rates
Gomes (2001)	Compustat, 1979–1988	spending on PPE minus capital retirements	deflator for nonresid. fixed investment	double declining
Chirinko and Schaller (2004)	193 Canadian firms, 1973–1986	capital expenditure on PPE	implicit price index for investment in machinery and equipment	double declining
Hennessy (2004)	278 manuf. firms, 1992–1995	capital expenditure on PPE	nonresid. investment price deflator	double declining
Bloom, Bond, and Reenen (2007)	U.K. manuf. firms, Datastream	total new fixed assets minus sales of fixed assets	an aggregate series for investment goods prices	8%
Gan (2007a)	847 Japanese manuf. firms	change in net PPE plus accounting depreciation	same in Hayashi and Inoue (1991)	same in Hayashi and Inoue (1991)
Gan (2007b)	420 Japanese manuf. firms	change in net PPE plus accounting depreciation	same in Hayashi and Inoue (1991)	same in Hayashi and Inoue (1991)
Gaspar and Massa (2007)	about 847 firms per year	change in net PPE	CPI	5%
Benfratello, Schiantarelli, and Sembenelli (2008)	Italian manuf. firms	investment in plants and machinery	the aggregate business investment price index	5%
Bloom (2009)	Compustat, 1981–2000	capital expenditure on PPE minus sales of PPE	industry-level investment price deflators, NBER-CES manuf. database	industry-level depreciation rates, NBER-CES manuf. database
Chirinko and Schaller (2009)	Compustat, 1980–2001	CAPX; for acquisition, change in PPEGT plus PPE retirements; for disinvestment, change in PPENT plus economic depreciation	sector-specific investment price deflators based on chained dollars from BEA	sector-specific current-cost depreciation rates based on chained dollars from BEA

How?

Prior 33 firm-level PIM studies

	Sample	Investment flows	Price deflators	Depreciation rates
Eberly, Rebelo, and Vincent (2012)	776 firms, 1981–2003, top quartile on capital stock in 1981	capital expenditure on PPE	implicit price deflator for nonresid. investment	2-digit SIC industry, double declining
Panousi and Papanikolaou (2012)	Compustat, 1970–2005	CAPX	price deflator for fixed nonresid. investment	3-digit SIC industry, double declining
Moyen and Platikanov (2013)	Compustat, 1988–2009	CAPX	producer price index for finished goods: capital equipment	double declining
Bustamante (2016)	Compustat, 1980–2014	CAPX minus SPPE	nonresid. investment deflator	accounting depreciation
Belo, Gala, Salomao, and Vitorino (2022)	Compustat, 1975–2016	change in PPENT plus accounting depreciation	equipment and structure deflators	accounting depreciation

What?

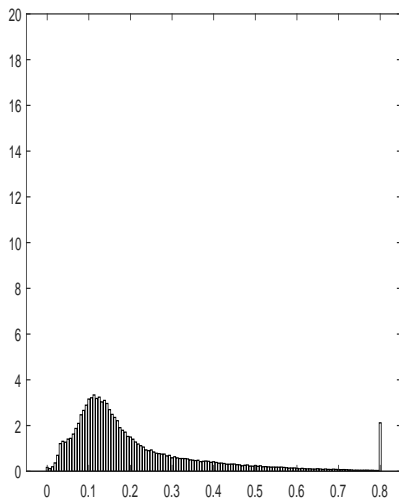
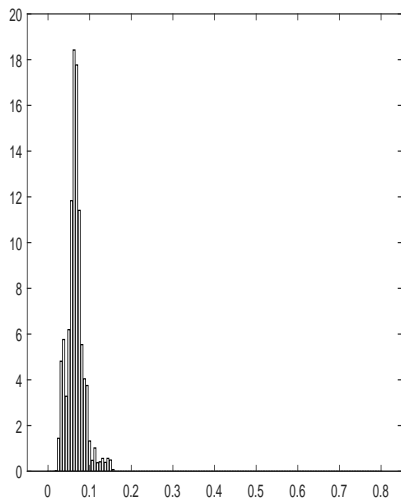
Basic moments of I_{it}^S/K_{it}^S , the 1963–2020 sample, 169,828 firm-years

	I_{it}^S/K_{it}^S	I_{it}^H/K_{it}^H	K_{it}^S/K_{it}^H	δ_{it}	δ_{it}^H
Mean	0.238	0.403	2.11	6.90	20.94
Median	0.130	0.228	1.61	6.86	16.10
Standard deviation	0.372	0.629	1.79	1.96	16.65
Autocorrelation	0.34	0.25	0.9	0.98	0.79
Skewness	3.33	3.47	3.58	0.65	2.01
Excess kurtosis	14.28	15.84	16.82	1.37	6.08

What?

Economic depreciation rates, δ_{it} (169,792 firm-years);

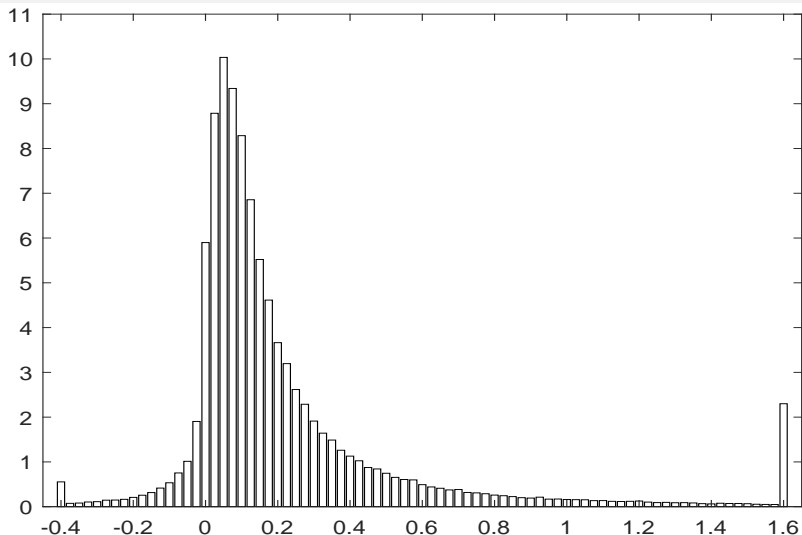
accounting depreciation rates, δ_{it}^H (177,412 firm-years)



What?

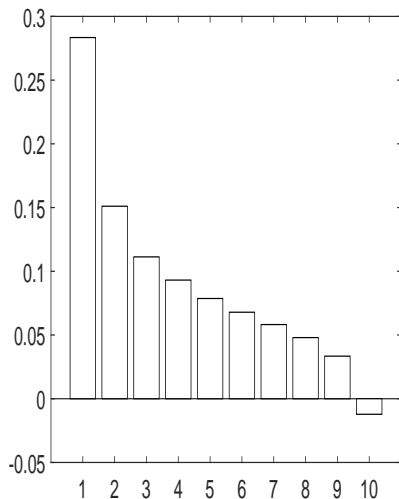
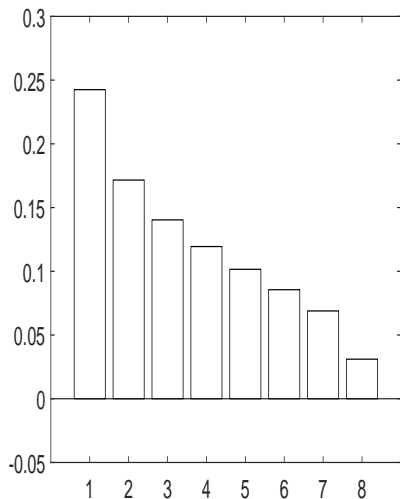
The asymmetric firm-level I_{it}^s/K_{it}^s distribution;

fractions of negative, inactive, and positive I_{it}^s/K_{it}^s : 5.51%, 2.85%, and 91.64%;
1.26% for negative spikes ($< -20\%$) versus 32.7% for positive spikes ($> 20\%$)



What?

For a typical firm, 39% of total $|I_{it}^S|$ done within 20% of the years in the Doms-Dunne (1998) tests; balanced panels by decade: 1963–1970 and 2011–2020



- 1 Meta-Analysis: A Macro-Micro Disconnect
- 2 Economic Accounting of Investment Rates
- 3 Salient Properties of Investment Rates

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Meta-Analysis

A top-down supply-side approach in the BEA's (2003) fixed assets accounts

Obtain the domestic supply of each capital good from its **producers**

Subtract capital purchases by government and consumers

Distribute investment totals by asset across industries with assumptions on the employment-capital relation

Form capital stocks by industry-asset via PIM

Meta-Analysis

Economic depreciation in the BEA's fixed assets accounts

Geometric depreciation roughly matches actual profiles of used capital price declines in the data (Hulten and Wykoff 1981a, b)

Asset-level economic depreciation rate: $\delta = B/L$, in which B is the **declining-balance rate** and L the **average service life**

B on average **1.65** for equipment and **0.91** for nonresidential structures; $\ll 2$ (the double-declining-balance rate)

Firm-level estimates of L unstable

Meta-Analysis

Plant-level studies; balanced panels from Longitudinal Research Database (LRD) in the 1972–1988 sample; left-censored at 1972; mostly sampling rotation every 5 year

Cooper and Haltiwanger (2006):

- A “striking **asymmetry** between positive and negative investment”: A fraction of 10.4% for negative, 8.1% for inactive, and 81.5% for positive investment rates

Doms and Dunne (1998):

- **Lumpiness**: For each plant, calculate the fraction of investment each year out of total investment; top 3 years account for **50.1%**

Meta-Analysis

An essential tension arising from the macro-micro disconnect

National accounting: Top-down, supply-based; geometric δ

Financial accounting: Bottom-up, demand-based; straight-line δ

- Net PPE as net capital
- Yet many scale with gross PPE (book assets)
- Accounting $\delta \gg$ geometric δ
- Scaling by gross PPE (book assets) brings basic moments closer to the BEA's

Building current-cost capital stocks with economic δ

Outline

- 1 Meta-Analysis: A Macro-Micro Disconnect
- 2 Economic Accounting of Investment Rates**
- 3 Salient Properties of Investment Rates

Economic Accounting

Conceptual framework

The quantity of capital stock accumulates as:

$$K_{it+1} = (1 - \delta_{it})K_{it} + I_{it}$$

δ_{it} : Economic depreciation rate

Rewriting in terms of current costs yields:

$$K_{it+1}^{\$} = \left((1 - \delta_{it}) \frac{K_{it}^{\$}}{P_{it}^K} + \frac{I_{it}^{\$}}{P_{it}^I} \right) P_{it+1}^K$$

P_{it}^K : Capital price deflator; P_{it}^I : Investment price deflator

PIM requires: (i) current-cost investment flows, $I_{it}^{\$}$; (ii) P_{it}^K and P_{it}^I ; (iii) δ_{it} ; and (iv) the initial current-cost capital stock, $K_{i0}^{\$}$

Economic Accounting

$I_{it}^{\$}$ = change in PPENT + accounting depreciation (Hayashi and Inoue 1991)

Net PPE = gross PPE minus accumulated depreciation:

$$\text{PPENT}_t = \text{PPEGT}_t - \text{DPACT}_t$$

ACQ_t : Gross book value of acquired fixed assets;

SR_t : Gross value of disposed fixed assets:

$$\text{PPEGT}_{t+1} = \text{PPEGT}_t + \text{ACQ}_t - \text{SR}_t$$

ACDACQ_t : Accumulated depreciation of acquired fixed assets;

ACDSR_t : **Accumulated depreciation for disposed fixed assets:**

$$\text{DPACT}_{t+1} = \text{DPACT}_t + \text{DP}_t + \text{ACDACQ}_t - \text{ACDSR}_t$$

Economic Accounting

Assume current-cost equals historical-cost investment flows

The chicken-egg problem of measuring investment and capital:

$$\begin{aligned} I_{it}^H &= \text{PPENT}_{t+1} - \text{PPENT}_t + \text{DP}_t \\ &= \text{PPEGT}_{t+1} - \text{PPEGT}_t - \text{ACDACQ}_t + \text{ACDSR}_t \\ &= \text{NACQ}_t - \text{NSR}_t \end{aligned}$$

dPPEGT **underestimates** $|I_{it}^{\$}|$ by 17% (median) or 71% (mean)

Poor coverage of $\text{NACQ}_t - \text{NSR}_t$ in Compustat

For acquired assets, historical costs are close to current costs; for disposed assets, typically, historical costs \neq current costs

Economic Accounting

Measuring disinvestment

Sales of PPE underestimate disinvestment:

- Ignores asset-for-equity and asset-for-debt sales
- Ignores other disposition methods, such as exchanges of nonmonetary assets, involuntary conversion (fire, flood, theft, and condemnation), and retirements
- Ignores spin-offs and changes in consolidation status (when a subsidiary is no longer consolidated)

However, $dPPENT + DP$ likely overstates disinvestment via restructuring charges, impairment losses, and FX translations

Economic Accounting

Capital and investment price deflators;
based on our extensive discussion with the BEA staff

Detailed tables for 63 private industries (the fixed assets accounts):

- **Current-cost** (current-dollar) capital stocks in private non-residential equipment, $K_{jt}^{\mathcal{E}\$}$, and structure, $K_{jt}^{S\$}$; **fixed-cost** (constant-dollar) capital stocks in private non-residential equipment, $K_{jt}^{\mathcal{E}}$, and structure, K_{jt}^S
- Current-cost investments in private non-residential equipment, $I_{jt}^{\mathcal{E}\$}$, and structure, $I_{jt}^{S\$}$; fixed-cost investments in private non-residential equipment, $I_{jt}^{\mathcal{E}}$, and structure, I_{jt}^S

Economic Accounting

Calculating industry- and sector-specific capital and investment price deflators

Industry j 's capital and investment price deflators:

$$P_{jt}^K = \frac{K_{jt}^{\mathcal{E}\$} + K_{jt}^{S\$}}{K_{jt}^{\mathcal{E}} + K_{jt}^S}; \quad P_{jt}^I = \frac{I_{jt}^{\mathcal{E}\$} + I_{jt}^{S\$}}{I_{jt}^{\mathcal{E}} + I_{jt}^S}$$

Sector s 's capital and investment price deflators:

$$P_{st}^K = \frac{\sum_{j \in s} K_{jt}^{\mathcal{E}\$} + \sum_{j \in s} K_{jt}^{S\$}}{\sum_{j \in s} K_{jt}^{\mathcal{E}} + \sum_{j \in s} K_{jt}^S}; \quad P_{st}^I = \frac{\sum_{j \in s} I_{jt}^{\mathcal{E}\$} + \sum_{j \in s} I_{jt}^{S\$}}{\sum_{j \in s} I_{jt}^{\mathcal{E}} + \sum_{j \in s} I_{jt}^S}$$

Economic Accounting

Annual growth rates in the BEA's capital price deflators, 1963–2020;
the BEA's ratios of capital-to-investment price deflators, 1963–2020

$$K_{it+1}^{\$} = \left((1 - \delta_{it}) \frac{K_{it}^{\$}}{P_{it}^K} + \frac{I_{it}^{\$}}{P_{it}^I} \right) P_{it+1}^K$$

	Mean	Std	Skew	Median	ρ_1
Aggregate	4.14	3.40	1.36	3.23	0.66
Sector	4.04	3.69	1.60	3.38	0.61
Industry	3.98	3.61	1.57	3.30	0.63

	Mean	Std	Skew	Median	ρ_1
Aggregate	0.91	0.09	0.78	0.88	0.972
Sector	0.91	0.11	0.00	0.91	0.966
Industry	0.91	0.12	-0.69	0.92	0.960

Economic Accounting

The detailed tables for 63 private industries from BEA's fixed assets accounts

Fixed-cost depreciation in private non-residential equipment, $D_{jt}^{\mathcal{E}}$, and structure, $D_{jt}^{\mathcal{S}}$; **fixed-cost** capital in private non-residential equipment, $K_{jt}^{\mathcal{E}}$, and structure, $K_{jt}^{\mathcal{S}}$; and **fixed-cost** investment in private non-residential equipment, $I_{jt}^{\mathcal{E}}$, and structure, $I_{jt}^{\mathcal{S}}$

Industry j 's economic depreciation rate in year t :

$$\delta_{jt} = \frac{D_{jt}^{\mathcal{E}} + D_{jt}^{\mathcal{S}}}{(K_{jt-1}^{\mathcal{E}} + K_{jt-1}^{\mathcal{S}}) + 0.5 \times (I_{jt}^{\mathcal{E}} + I_{jt}^{\mathcal{S}})}$$

Different from current-cost depreciation rate, $\delta_{jt}^{\$}$

Economic Accounting

The BEA's economic depreciation rates, 1963–2020

	Mean	Std	Skew	Median	ρ_1
Aggregate	5.71	0.48	0.51	5.61	0.994
Sector	5.90	2.21	1.00	5.37	0.999
Industry	6.49	2.51	0.96	6.32	0.999

Economic Accounting

The initial values of current-cost capital stocks via the PIM based on asset age; inspired by Salinger and Summers (1983) but differ in many details

Left-censoring still in Compustat (no sampling rotation)

In year 0 (first year with available net and gross PPE), estimate oldest asset age, A_i , as $DPACT/DP$ times 2

Estimate $K_{i0}^{\$}$ from iterating from year $-A_i$ to year 0, with the initial capital of 0 and investment $PPEGT_{i0}/(A_i + 1)$ each year

Outline

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Properties

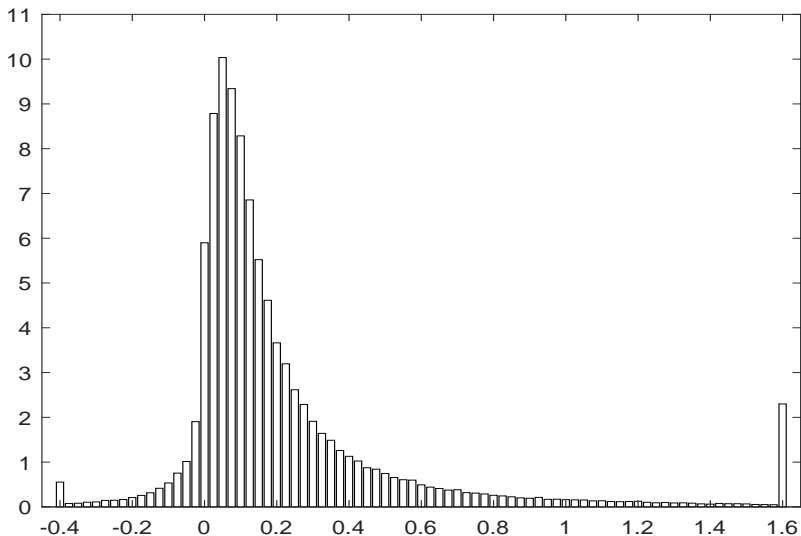
Basic moments, 1963–2020, $I_{it}^{\$}/K_{it}^{\$}$: Current-cost investment rates;

$I_{it}/K_{it} \equiv (I_{it}^{\$}/K_{it}^{\$})(P_{it}^K/P_{it}^I)$: Real investment rates

	Mean	Std	Skew	Kurt	5th	50th	95th	ρ_1		
$I_{it}^{\$}/K_{it}^{\$}$	23.84	37.20	3.33	14.28	-1.97	13.03	87.07	0.34		
I_{it}/K_{it}	20.43	31.48	3.30	14.15	-1.72	11.37	73.97	0.33		
$(CAPX-SPPE)/K_{it}^{\$}$	19.36	24.71	3.08	11.99	1.44	11.89	63.80	0.51		
	f_-	f_0	$f_{0.2}^-$	$f_{0.3}^-$	$f_{0.4}^-$	$f_{0.5}^-$	$f_{0.2}^+$	$f_{0.3}^+$	$f_{0.4}^+$	$f_{0.5}^+$
$I_{it}^{\$}/K_{it}^{\$}$	5.51	2.85	1.26	0.73	0.44	0.28	32.66	20.70	14.49	10.80
I_{it}/K_{it}	5.42	3.26	1.08	0.58	0.33	0.21	28.19	17.34	11.88	8.76
$(CAPX-SPPE)/K_{it}^{\$}$	1.81	2.72	0.36	0.22	0.15	0.10	27.52	15.85	10.26	7.24

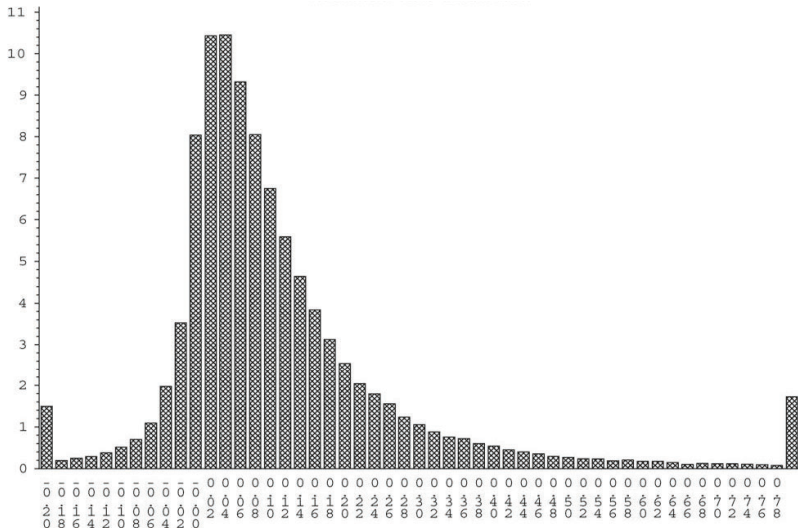
Properties

Asymmetric firm-level investment rates; the fractions of negative, inactive, and positive rates: 5.51%, 2.85%, and 91.64%, respectively



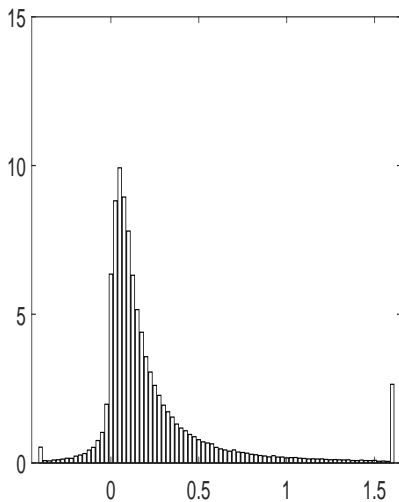
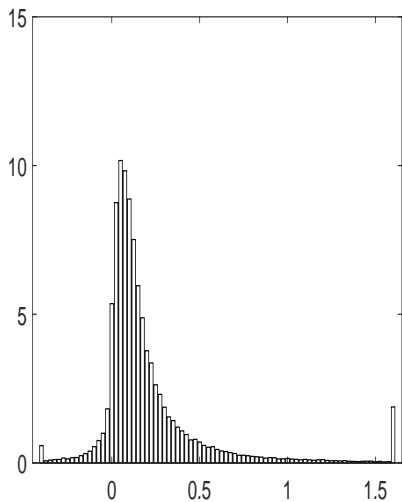
Properties

Asymmetric plant-level investment rates (Cooper and Haltiwanger 2006); the fractions of negative, inactive, and positive rates: 10.4%, 8.1%, and 81.5%, respectively



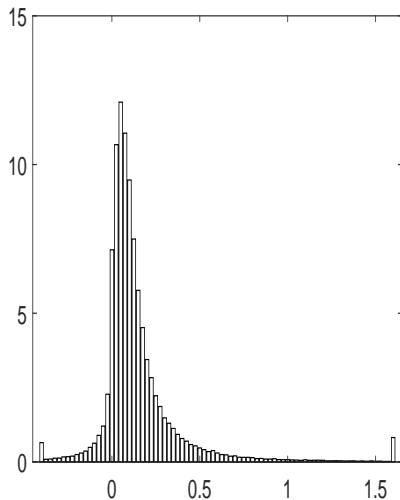
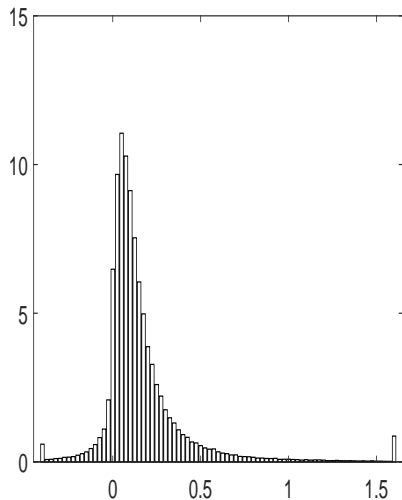
Properties

1963–1991 versus 1992–2020; skewness: 3.25, 3.4



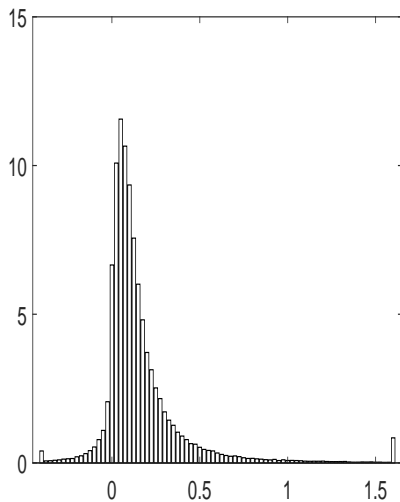
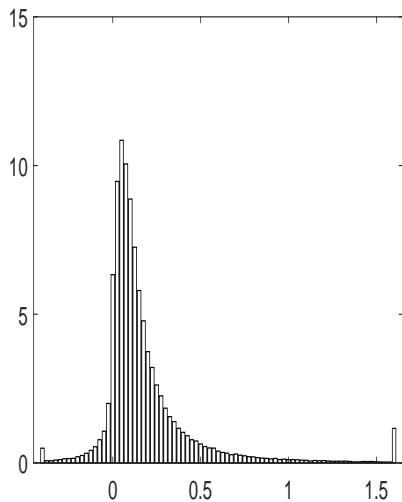
Properties

$(I-CAPX)/K^{\$} \leq 15\%$ versus $(I-CAPX)/K^{\$} \leq 5\%$; skewness: 3.83, 4.09



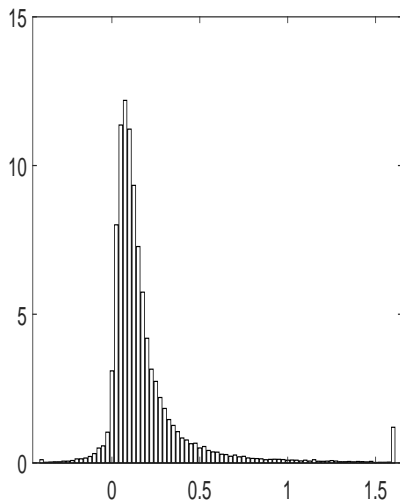
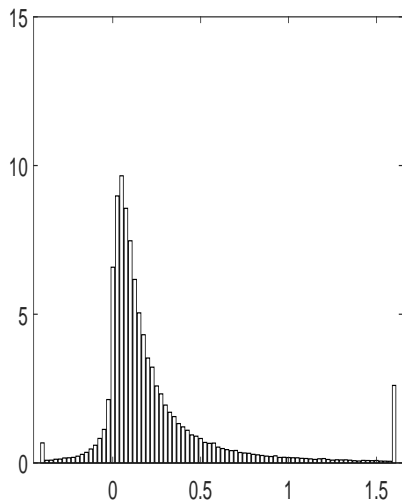
Properties

No first 3 versus no first 5 years; skewness: 3.8, 4.13



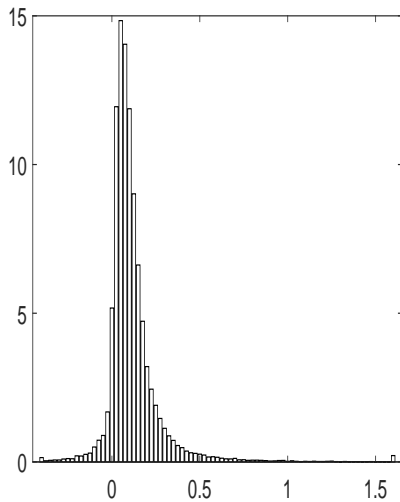
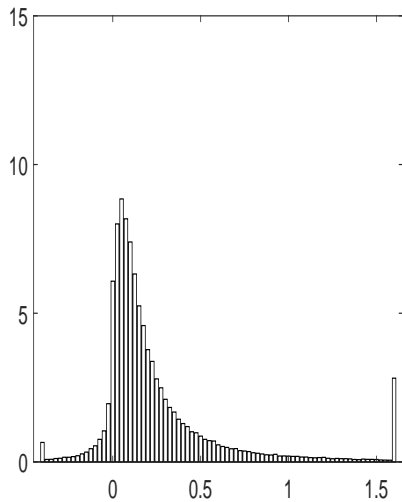
Properties

Small versus big market equity; skewness: 3.14, 3.98



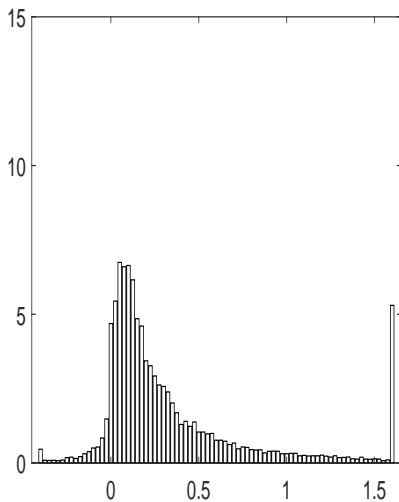
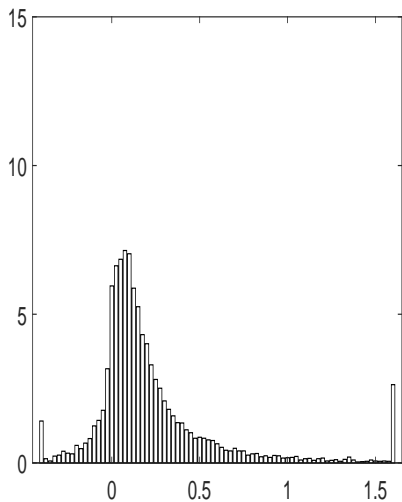
Properties

Small versus big K^S ; skewness: 3.02, 3.79



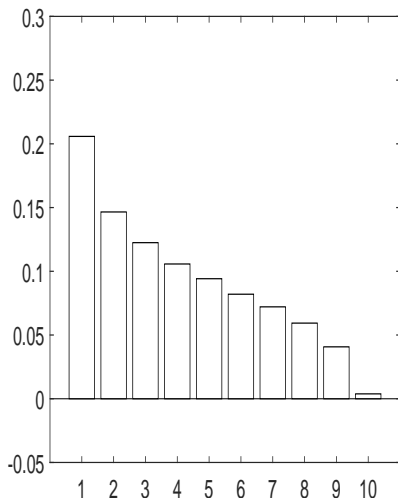
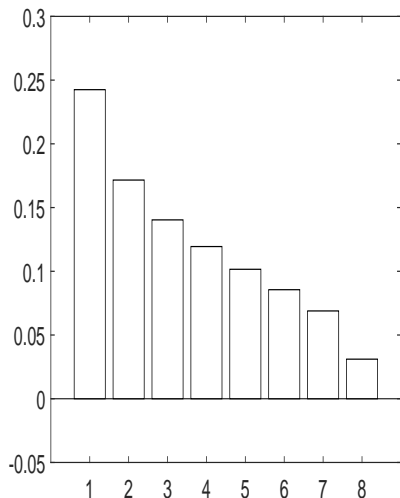
Properties

Mining versus information sector (2 out of 19); skewness: 3.94, 4.6



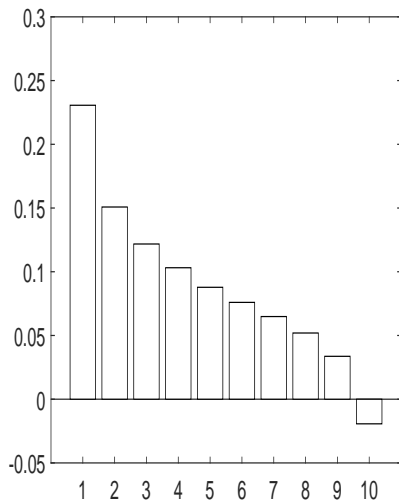
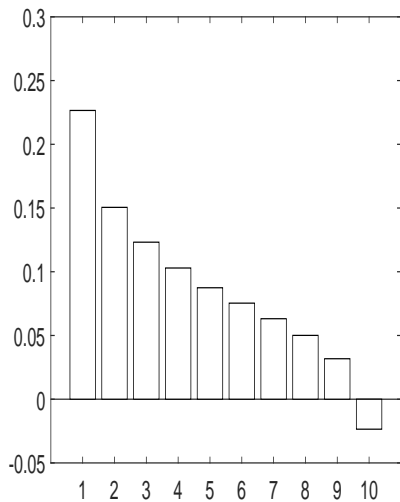
Properties

For a typical firm, 39% of total $|I_{it}^S|$ done within 20% of the years; balanced panels by decade; 1963–1970 (768, 41.41%) and 1971–1980 (1,218, 35.24%)



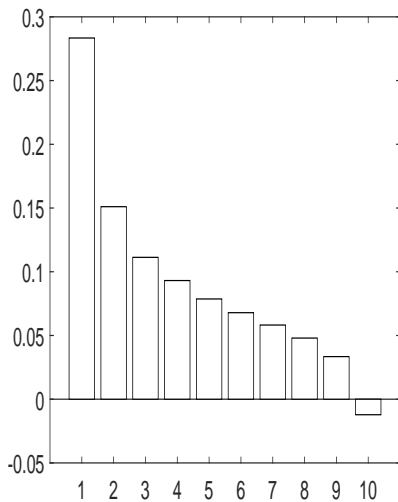
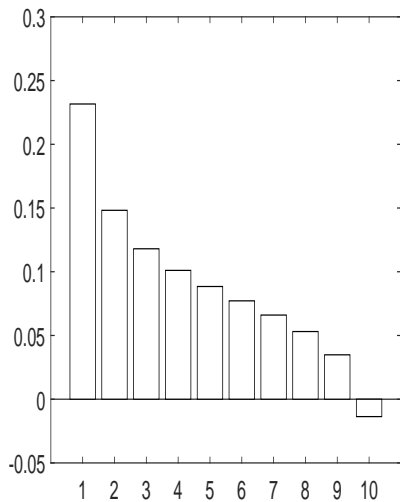
Properties

Lumpy investment: 1981–1990 (1,361, 37.71%) and 1991–2000 (1,490, 38.14%)



Properties

Lumpy investment: 2001–2010 (1,637, 37.98%) and 2011–2020 (1,281, 43.45%)



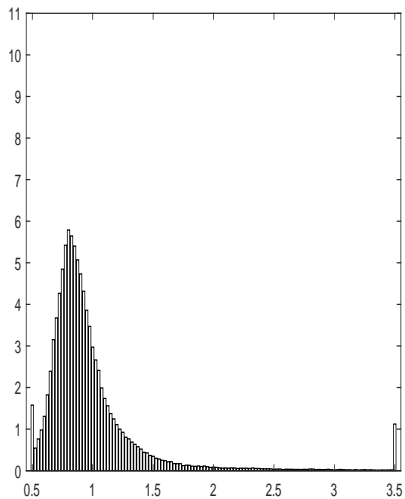
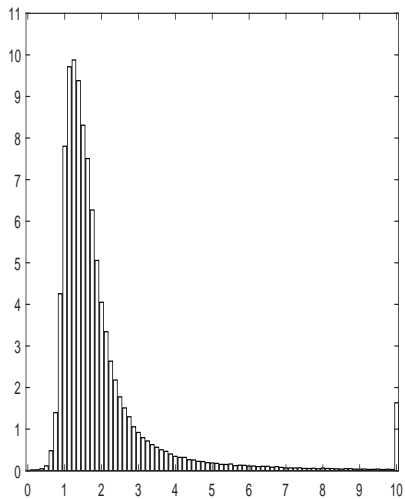
Properties

Differences between K^S , PPENT, and PPEGT, 1963–2020

	Mean	Std	Skew	Kurt	5th	25th	50th	75th	95th	ρ_1
$K_{it}^S/PPENT$	2.11	1.79	3.58	16.82	1.01	1.29	1.61	2.16	4.85	0.90
$K_{it}^S/PPEGT$	0.98	0.42	3.23	14.86	0.64	0.78	0.88	1.03	1.61	0.91
K_{it}^S/AT	0.53	0.39	1.22	1.48	0.09	0.24	0.43	0.73	1.30	0.97
I_{it}^S/K_{it}^S	23.84	37.20	3.33	14.28	-1.97	6.19	13.03	26.70	87.07	0.34
$I_{it}^H/PPEGT$	21.47	34.16	3.48	15.62	-2.11	5.82	11.82	23.66	77.37	0.33
$I_{it}^S/K_{it}^S - I_{it}^H/PPEGT$	2.66	9.64	1.04	10.89	-6.79	-0.39	1.35	4.22	16.91	0.48
	f_-	f_0	$f_{0.2}^-$	$f_{0.3}^-$	$f_{0.4}^-$	$f_{0.5}^-$	$f_{0.2}^+$	$f_{0.3}^+$	$f_{0.4}^+$	$f_{0.5}^+$
I_{it}^S/K_{it}^S	5.51	2.85	1.26	0.73	0.44	0.28	32.66	20.70	14.49	10.80
$I_{it}^H/PPEGT$	5.59	2.87	1.16	0.64	0.35	0.21	28.92	17.99	12.46	9.20

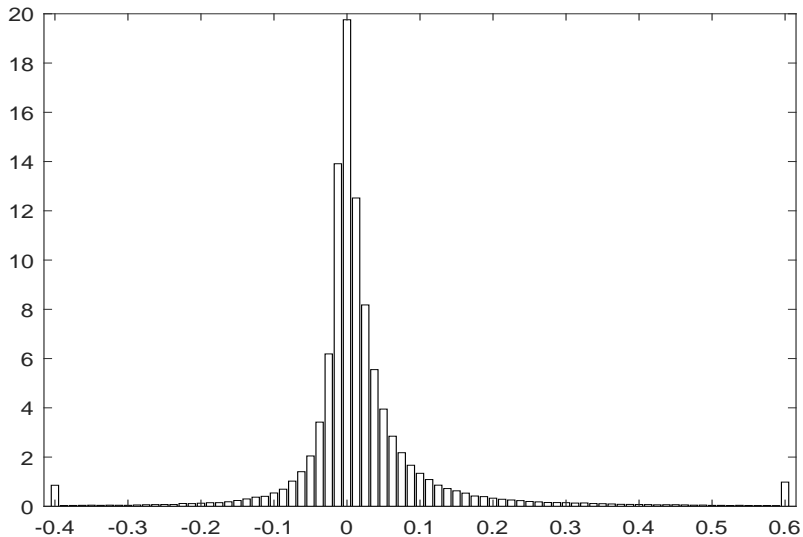
Properties

$K_{it}^{\$}/PPENT$ (169,828 firm-years) versus $K_{it}^{\$}/PPEGT$ (169,509 firm-years)



Properties

$I_{it}^S/K_{it}^S - I_{it}^H/PPEGT$ (169,509 firm-years); $I_{it}^H/PPEGT$ not in the prior literature



Conclusion

“Asymmetric Investment Rates”

Building the data infrastructure of **firm-specific current-cost capital stocks for the entire Compustat universe**

Characterizing accurately firm-level investment rate properties, including its **asymmetry** and **lumpiness**

Potential impact on empirical finance, applied theories, and macro