Dun & Bradstreet's US Equity Alpha Factor Library

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Introducing Dun & Bradstreet's US Equity Alpha Factor Library

- **Objective:** We identify Dun & Bradstreet trade factors that have a high degree of statistical significance in forecasting future one-month excess stock returns (or alphas).

- **Methodology:**
  - We sort firms into decile portfolios according to their factor ranking at each month t with the portfolio, take a long position in the top decile and a short position in the bottom decile for each factor at the end of month t, and hold to the close of month t+1.
  - We identify factors that provide **alphas not explained by Carhart's Four-Factor Model** (i.e., the Fama-French 3-Factor Model plus Momentum).
  - We test both equal weighted and cap-weighted returns, and apply two criteria to select factors:
    1. Absolute value of alpha t-statistic (equal-weighted top-bottom decile spread alpha) >= 1.9; OR
    2. Absolute value of alpha t-statistic (market cap-weighted top decile alpha) >= 1.9 OR
       Absolute value of alpha t-statistic (market cap-weighted bottom decile alpha) >= 1.9

- **Results:** We identify 35 factors that pass Criterion 1, 89 factors that pass Criterion 2 and 13 factors that pass both Criteria 1 and 2. Only factors passing Criterion 1 or 2 will be included in the factory library.

- **Data and derived attributes:** all US listed securities are covered. Refer to slide 4 for history coverage by sources.

Four-Factor Alphas – Methodology in Details

- In the below Carhart four-factor model, the intercept in this model, α, is referred to as the "four-factor alpha" and it represents a stock's return that is not explained by the other four common factors:

$$R_t = \alpha + \beta_{Mkt-Rf} \cdot (Mkt - Rf)_t + \beta_{HML} \cdot HML_t + \beta_{SMB} \cdot SMB_t + \beta_{MOM} \cdot MOM_t + \varepsilon_t$$

- $\beta_{Mkt\text{-}Rf}$ is the exposure to the stock market (what we commonly refer to as beta), β_{HML} is exposure the value premium or the high minus low (HML) book-to-market ratio return spread, β_{SMB} is exposure to the small-stock premium or the small minus big (SMB) return spread and β_{MOM} is exposure to the stock price momentum premium (MOM) or the winners minus losers return spread.

- We test for four-factor alphas on long/short equal-weighted portfolios and also on long-only and short-only capitalization-weighted portfolios.

- We show the regression exposures and plot the cumulative total returns for each factor.

Alpha Factor Library Data Sources

Source	Description	Availability	Frequency
Credit Scoring Archive Database (CSAD)	Summarized payment information from 12- month accounts receivable data	2005 - Current	Monthly
Viability Rating	A multi-dimensional score that predicts the likelihood of a business becoming not viable in the next 12 months	Dec 2010 – Current	Monthly
Delinquency Predictor	A score that predicts the likelihood of a business making severely delinquent payments in the next 12 months	Dec 2010 – Current	Monthly
Total Loss Predictor	A score that predicts the likelihood of a business not making a payment in the next 9 months	Dec 2010 – Current	Monthly
Supplier Evaluation Risk (SER)	A score that evaluates the risk of supply chain disruption	2010 – Current	Monthly
Detailed Trade (DTRI)	Monthly trending of payment history	Jan 2010 - Current	Monthly
Inquiry	Transactional level inquiries on a business from a D&B's customer	2001 – Current	Daily

For complete listing of D&B's Predictive Attribute Sources Contributing to Alpha Generation, please contact D&B

13 CSAD Factors that satisfy both criteria 1 AND 2. These are the strongest factors with longest history in our library…

	Equal-Weighted Top-Bottom Decile Spread Alpha		Market Cap-Weighted Top Decile Alpha		Market Cap-Weighted Bottom Decile Alpha			
Variable	**Alpha Coefficient**	**Alpha T-Statistic**	**Alpha Coefficient**	**Alpha T-Statistic**	**Alpha Coefficient**	**Alpha T-Statistic**	**Definition**	**Trend**
ISS_PAYNORM	55.02	3.05	41.3	3.62	-29.9	-1.68	Inverted Standardized Score (ISS) for PAYNORM	Higher value **outperforms**
hicdtavg.adj	-54.88	-2.05	-58.32	-2.56	2.57	0.48	"average high credit" normalized by sales	Low value **outperforms**
d_pm.pc12	-51.32	-4.4	-30.66	-2.35	25.72	2.27	12-month % change in "dollar with a pay manner"	
totdoll.pc12	-49.34	-4.36	-29.2	-2.22	25.41	2.27	12-month % change in "total dollars"	
pexp_s_n.pc12	-45.31	-3.79	-18.65	-1.42	25.29	2.29	12-month % change in "# negative and slow payment experiences"	
hicdtavg.pc12	-41.39	-3.7	-25.29	-2.09	6.54	0.51	12-month % change in "average high credit"	
payref.pc12	-40.23	-3.55	-34.22	-2.37	22.65	2.16	12-month % change in "# of suppliers"	
d_cur.pc12	-37.33	-3.27	-26.72	-2.16	7.61	0.74	12-month % change in "current dollars"	
d_sat.pc12	-36.56	-3.21	-27.42	-2.19	7.47	0.7	12-month % change in "satisfactory dollars"	
npayexp.pc12	-32.12	-2.57	-25.45	-1.91	21.96	2.26	12-month % change in "# payment experiences"	
payref.pc	-30.19	-2.84	-29.97	-2.21	1.47	0.15	1-month % change in "# of suppliers"	
totdoll.pc	-25.79	-2.32	-1.61	-0.15	30.62	3.3	1-month % change in "total dollars"	
d_pm.pc	-23.82	-2.33	-5.87	-0.53	33.55	3.69	1-month % change in "dollar with a pay manner"	

13 DTRI Factors that satisfy both criteria 1 AND 2 (see next 2 slides for definitions)

	Equal-Weighted Top-Bottom Decile Spread Alpha		Market Cap-Weighted Top Decile Alpha		Market Cap-Weighted Bottom Decile Alpha	
Variable	**Alpha Coefficient**	**Alpha T-Statistic**	**Alpha Coefficient**	**Alpha T-Statistic**	**Alpha Coefficient**	**Alpha T-Statistic**
dt_31p_3m_mo_av_amt.adj	-74.8	-4.2	4.19	0.23	32.98	2.26
dt_31p_3m_amt.adj	-71.95	-4.29	13.8	0.77	25.6	1.96
dt_31p_3m_acct_av_amt.adj	-71.74	-3.48	-62.14	-2.65	27.55	2.15
dt_pd_3m_acct_av_amt.adj	-69.14	-2.64	-57.07	-2	17.38	1.1
dt_tot_owd_rcnt_amt.adj	-67.53	-3.16	38.89	2.01	11.77	1
dt_31p_3m_31p_acct_av_amt.adj	-64.4	-2.07	-62.26	-2.25	-6.62	-0.79
dt_61p_3m_61p_acct_av_amt.adj	-57.6	-1.94	-66.88	-2.55	-4.82	-0.53
dt_31p_3m_acct_av_amt	-54.68	-3.35	-2.38	-0.33	24.07	1.97
dt_31p_3m_mo_av_amt.pc12	-50.01	-2.02	-69.28	-2.01	13.49	0.52
dt_31p_by_owd_xpnd_3m_mx_pct	-36.83	-2.97	-13.28	-1.15	24.84	2.06
dt_acct_61p_xpnd_3m_mx_pct	-33.02	-2.51	-15.18	-1.93	4.25	0.41
dt_61p_by_owd_xpnd_3m_mx_pct	-27.26	-2.37	-30.17	-2.7	-0.5	-0.05
dt_61p_by_owd_rcnt_pct	-25.37	-2.21	-31.06	-2.77	-0.08	-0.01

DTRI Variable	Definition	Definition of Original Variable
dt_31p_3m_mo_av_amt.adj	dt_31p_3m_mo_av_amt/sales	The average monthly dollar amount that is more than 30 days beyond terms (past due) across all of the trading relationships between this entity and its suppliers corresponding to trade activity reported to D&B during the 3 most recent months - including the current month and 2 months prior (if their was activity reported in the current month) or the 3 months prior to the current month (if there was no activity reported in the current month)
dt_31p_3m_amt.adj	dt_31p_3m_amt/sales	The sum (across all accounts associated with this business and reported to D&B) of amounts that reached 31 days or more past-due during the most recent month and 3 months prior
dt_31p_3m_acct_av_amt.adj	dt_31p_3m_acct_av_amt/sales	The ratio of total amount 31+ days past due (across all accounts) to the total number of active accounts. Both the numerator and denominator of this ratio are summed over the most recent month and 3 months prior.
dt_pd_3m_acct_av_amt.adj	dt_pd_3m_acct_av_amt/sales	The ratio of total amount owed (across all accounts) to the total number of active accounts. Both the numerator and denominator of this ratio are summed over the most recent month and 3 months prior.
dt_tot_owd_rcnt_amt.adj	dt_tot_owd_rcnt_amt/sales	The total amount owed across all accounts, as reported to D&B, for this business, in the most recent available month
dt_31p_3m_31p_acct_av_amt.adj	dt_31p_3m_31p_acct_av_amt/sales	the ratio of total amount 31 or more days past due to the number of accounts 31 or more days past due during the most recent month and 3 months prior.
dt_61p_3m_61p_acct_av_amt.adj	dt_61p_3m_61p_acct_av_amt/sales	the ratio of total amount 61 or more days past due to the number of accounts 61 or more days past due during the most recent month and 3 months prior.

DTRI Variable	Definition	Definition of Original Variable
dt_31p_3m_acct_av_amt		The ratio of total amount 31+ days past due (across all accounts) to the total number of active accounts. Both the numerator and denominator of this ratio are summed over the most recent month and 3 months prior.
dt_31p_3m_mo_av_amt.pc12	12-mth percentage changes in "dt_31p_3m_mo_av_amt"	The average monthly dollar amount that is more than 30 days beyond terms (past due) across all of the trading relationships between this entity and its suppliers corresponding to trade activity reported to D&B during the 3 most recent months - including the current month and 2 months prior (if their was activity reported in the current month) or the 3 months prior to the current month (if there was no activity reported in the current month)
dt_31p_by_owd_xpnd_3m_mx_pct		Highest ratio of cumulative 31+ days past due amounts divided by cumulative amounts owed for most recent month and 3 months prior. For this 4 month period we take the highest of following 4 ratios: The total amount 31+ days past due divided by the total amount owed for month 1, the sum of (the total amounts 31+ days past due in month 1 and month 2) divided by the sum of (the total amounts owed in month 1 and month 2), the sum of (the total amounts past due in months 1, 2, and 3) divided by the sum of (the totals owed in months 1,2 and 3), the sum of (the total amounts past due in months 1, 2, 3, and 4) divided by the sum of (the total amounts owed in months 1,2, 3, and 4)
dt_acct_61p_xpnd_3m_mx_pct		Highest ratio of cumulative 31+ days past due amounts divided by cumulative amounts owed for most recent month and 3 months prior. For this 4 month period we take the highest of following 4 ratios: The total amount 31+ days past due divided by the total amount owed for month 1, the sum of (the total amounts 31+ days past due in month 1 and month 2) divided by the sum of (the total amounts owed in month 1 and month 2), the sum of (the total amounts past due in months 1, 2, and 3) divided by the sum of (the totals owed in months 1,2 and 3), the sum of (the total amounts past due in months 1, 2, 3, and 4) divided by the sum of (the total amounts owed in months 1,2, 3, and 4)
dt_61p_by_owd_xpnd_3m_mx_pct		Highest ratio of cumulative 31+ days past due amounts divided by cumulative amounts owed for most recent month and 3 months prior. For this 4 month period we take the highest of following 4 ratios: The total amount 31+ days past due divided by the total amount owed for month 1, the sum of (the total amounts 31+ days past due in month 1 and month 2) divided by the sum of (the total amounts owed in month 1 and month 2), the sum of (the total amounts past due in months 1, 2, and 3) divided by the sum of (the totals owed in months 1,2 and 3), the sum of (the total amounts past due in months 1, 2, 3, and 4) divided by the sum of (the total amounts owed in months 1,2, 3, and 4)
dt_61p_by_owd_rcnt_pct		Highest ratio of cumulative 31+ days past due amounts divided by cumulative amounts owed for most recent month and 3 months prior. For this 4 month period we take the highest of following 4 ratios: The total amount 31+ days past due divided by the total amount owed for month 1, the sum of (the total amounts 31+ days past due in month 1 and month 2) divided by the sum of (the total amounts owed in month 1 and month 2), the sum of (the total amounts past due in months 1, 2, and 3) divided by the sum of (the totals owed in months 1,2 and 3), the sum of (the total amounts past due in months 1, 2, 3, and 4) divided by the sum of (the total amounts owed in months 1,2, 3, and 4)

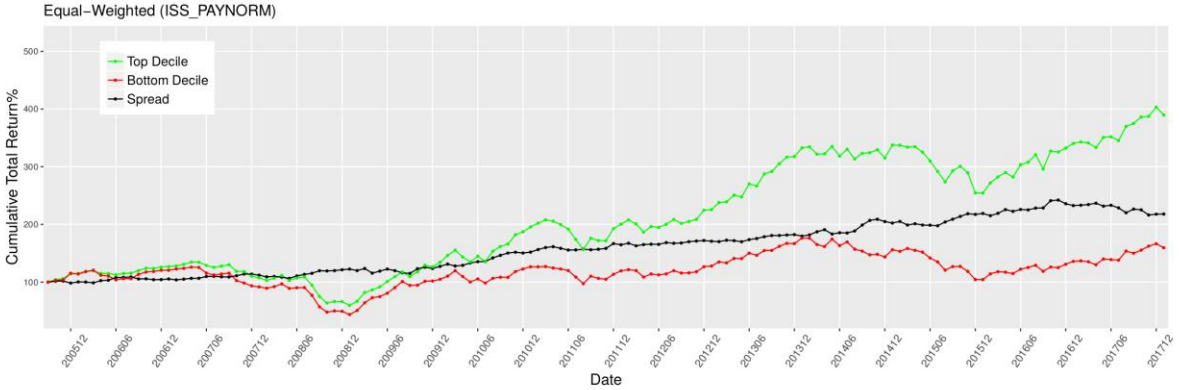
Consistent late payer peer groups (top decile) outperform inconsistent early payers

- **Factor** ISS_PAYNORM = inversed standard score (ISS) for paynorm
- **Equal-weighted**: top decile outperforms bottom decile (+55.0 basis points); **Market cap-weighted**: top decile outperforms market (+41.3 basis points)

Equal-Weighted

	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	56.37	109.42	53.04
2	Alpha	55.02*** (3.05)	23.98* (1.77)	-31.05 (-1.58)
3	Mkt-Rf	0.01 (0.29)	1.05 (28.87)	1.04 (19.71)
4	SMB	-0.06 (-0.72)	0.86 (13.37)	0.92 (9.92)
5	HML	-0.03 (-0.31)	-0.11 (-1.66)	-0.08 (-0.87)
6	MOM	0.16 (2.54)	-0.16 (-3.45)	-0.33 (-4.73)

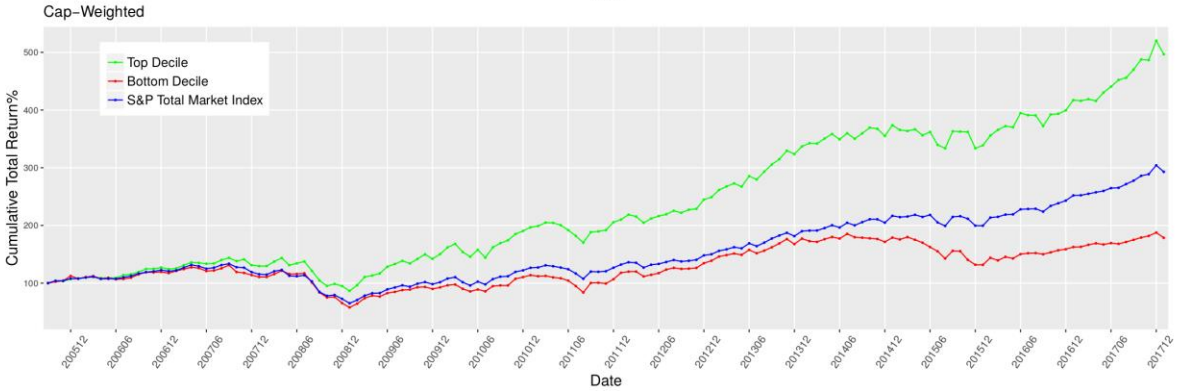
*, **, and *** denote significance at the 10%, 5%, and 1% level



Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	119.15	52.94
2	Alpha	41.30*** (3.62)	-29.90* (-1.68)
3	Mkt-Rf	1.01 (33.08)	1.10 (22.91)
4	SMB	0.18 (3.38)	0.09 (1.08)
5	HML	-0.16 (-2.79)	0.03 (0.39)
6	MOM	-0.08 (-1.87)	-0.04 (-0.70)

*, **, and *** denote significance at the 10%, 5%, and 1% level



High relative trade credit (top decile) underperforms

- **Factor** hicdtavg.adj = "high credit average" normalized by sales
- **Equal-weighted**: top decile underperforms bottom decile (-54.9 basis points). **Market cap-weighted**: top decile underperforms market (-58.3 basis points)

Equal–Weighted

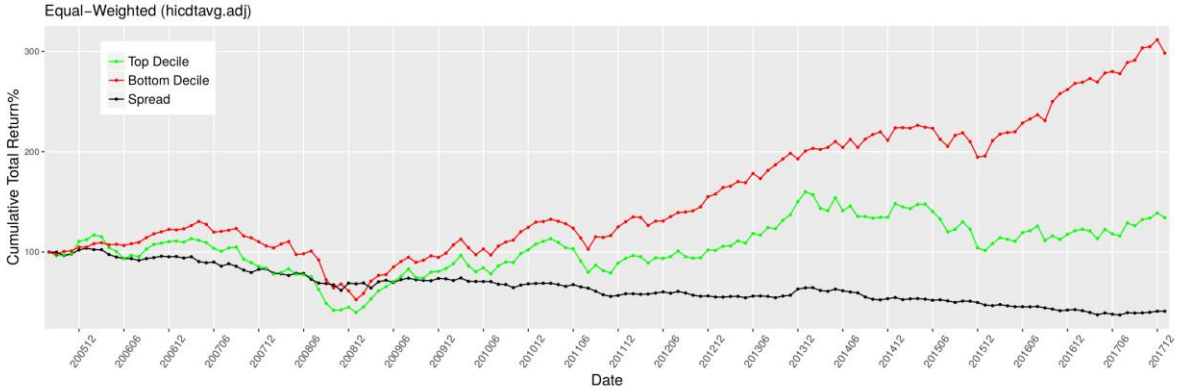
	Variable	Top–Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−44.68	42.00	86.68
2	Alpha	−54.88** (−2.05)	−41.12 (−1.52)	13.76** (2.02)
3	Mkt−Rf	0.05 (0.72)	1.03 (14.06)	0.97 (53.06)
4	SMB	0.76 (5.98)	1.13 (8.78)	0.37 (11.44)
5	HML	−0.71 (−5.25)	−0.40 (−2.98)	0.30 (8.78)
6	MOM	−0.27 (−2.86)	−0.29 (−3.01)	−0.02 (−0.71)

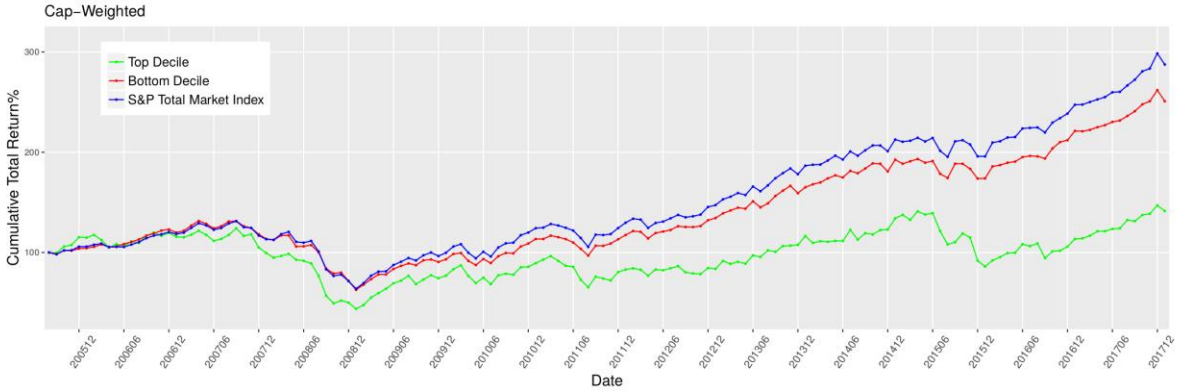
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap–Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	46.41	70.10
2	Alpha	−58.32** (−2.56)	2.57 (0.48)
3	Mkt−Rf	1.34 (21.91)	0.95 (66.49)
4	SMB	0.79 (7.29)	−0.24 (−9.35)
5	HML	−0.49 (−4.28)	0.21 (7.86)
6	MOM	−0.12 (−1.49)	0.07 (3.56)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increased year-o-year dollars with pay manner group (top decile) underperforms

- **Factor** d_pm.pc12 = 12-month percentage change in “dollars with a pay manner”
- **Equal-weighted**: top decile underperforms bottom decile (-51.3 basis points). **Market cap-weighted**: top decile under performs market (-30.7 basis points) while bottom decile outperforms market (+25.7 basis points)

Equal-Weighted

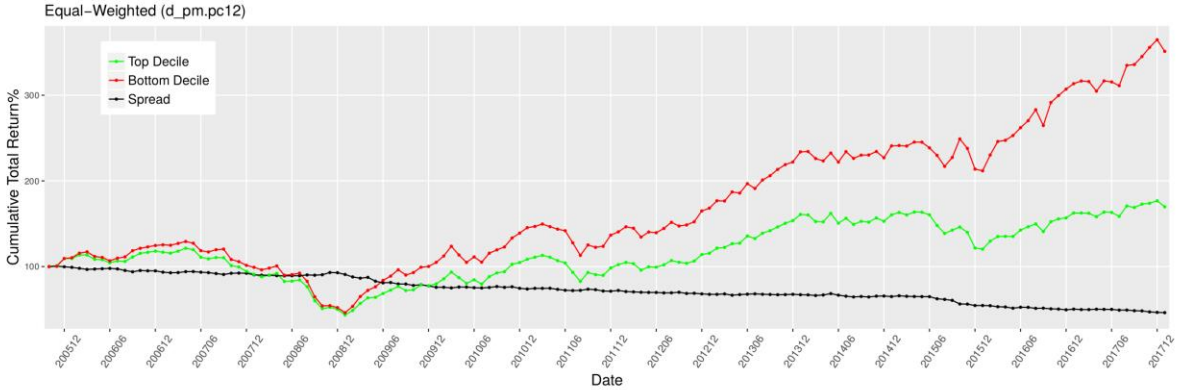
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	-51.10	51.71	102.81
2	Alpha	-51.32*** (-4.40)	-25.54** (-1.99)	25.78* (1.73)
3	Mkt-Rf	0.00 (0.03)	0.98 (28.28)	0.98 (24.42)
4	SMB	-0.02 (-0.34)	0.80 (13.25)	0.82 (11.71)
5	HML	-0.02 (-0.28)	0.14 (2.25)	0.16 (2.17)
6	MOM	0.06 (1.58)	-0.00 (-0.02)	-0.07 (-1.25)

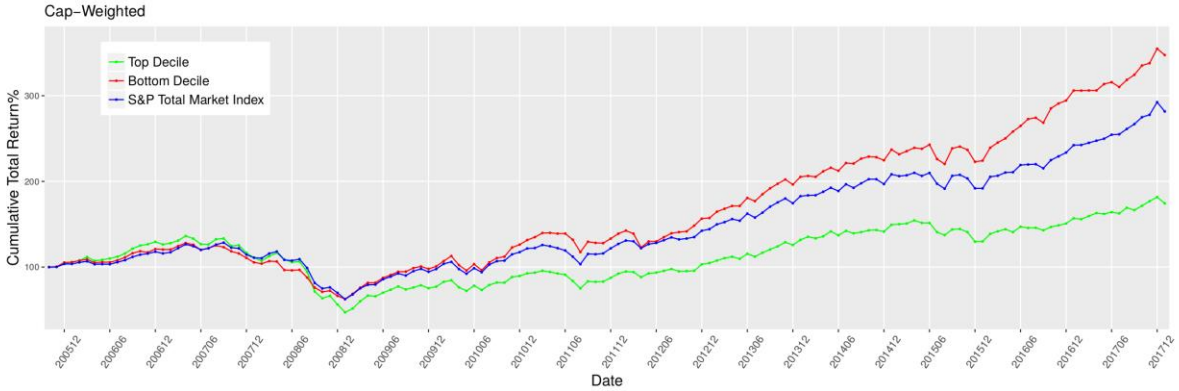
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	51.84	94.32
2	Alpha	-30.66** (-2.35)	25.72** (2.27)
3	Mkt-Rf	1.13 (32.28)	0.94 (30.82)
4	SMB	0.04 (0.64)	0.01 (0.24)
5	HML	0.12 (1.88)	0.12 (2.06)
6	MOM	-0.01 (-0.26)	0.02 (0.57)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increased year-o-year total dollars group (top decile) underperforms

- **Factor** totdoll.pc12 = 12-month percentage change in "total dollars"
- **Equal-weighted**: top decile underperforms bottom decile (-49.3 basis points). **Market cap-weighted**: top decile underperforms market (-29.2 basis points) while bottom decile outperforms market (+25.4 basis points)

Equal–Weighted

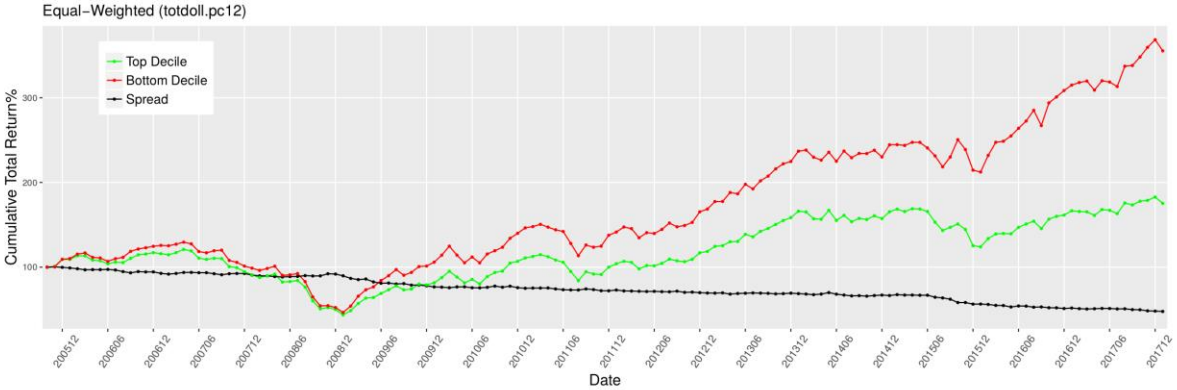
	Variable	Top–Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−49.79	53.99	103.79
2	Alpha	−49.34*** (−4.36)	−23.47* (−1.82)	25.87* (1.81)
3	Mkt–Rf	−0.01 (−0.30)	0.98 (28.39)	0.99 (25.85)
4	SMB	−0.01 (−0.25)	0.80 (13.18)	0.81 (12.08)
5	HML	−0.02 (−0.30)	0.15 (2.27)	0.16 (2.28)
6	MOM	0.07 (1.70)	−0.01 (−0.12)	−0.07 (−1.46)

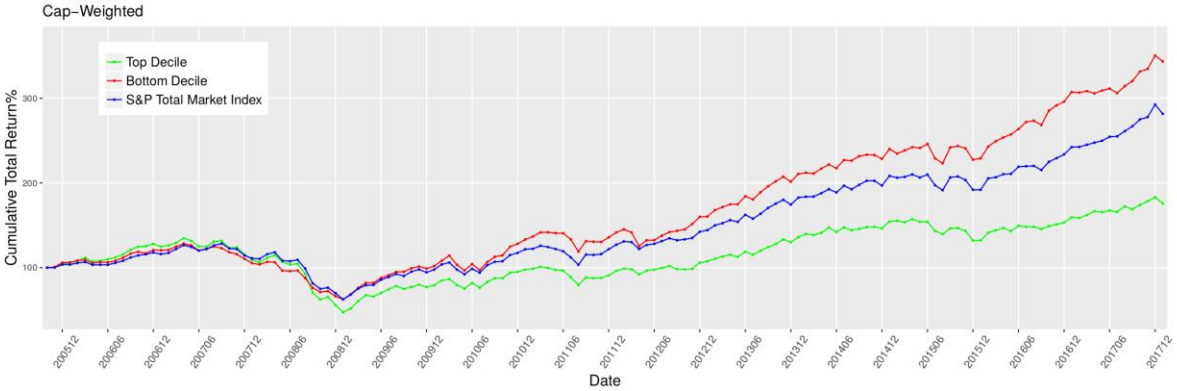
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap–Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	52.16	93.46
2	Alpha	−29.20** (−2.22)	25.41** (2.27)
3	Mkt–Rf	1.11 (31.46)	0.93 (30.91)
4	SMB	0.04 (0.69)	0.03 (0.50)
5	HML	0.11 (1.65)	0.12 (2.12)
6	MOM	−0.03 (−0.69)	0.02 (0.46)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increased year-o-year # of slow/negative payment experiences group (top decile) underperforms

- **Factor** pexp_s_n.pc12 = 12-month percent change in "# negative & slow payment experiences"
- **Equal-weighted**: top decile underperforms bottom decile (-45.3 basis points). **Market cap-weighted:** bottom decile outperforms market (+25.3 basis points)

Equal-Weighted

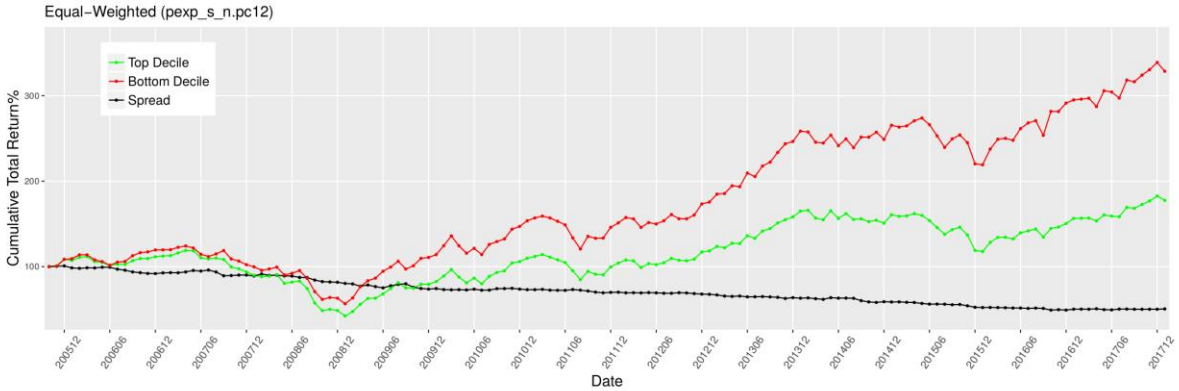
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−40.20	55.85	96.05
2	Alpha	−45.31*** (−3.79)	−22.27 (−1.54)	23.04* (1.91)
3	Mkt−Rf	0.09 (2.65)	1.00 (25.66)	0.91 (28.18)
4	SMB	−0.13 (−2.32)	0.75 (10.98)	0.88 (15.48)
5	HML	0.04 (0.73)	0.11 (1.55)	0.07 (1.13)
6	MOM	−0.01 (−0.12)	−0.09 (−1.74)	−0.08 (−1.97)

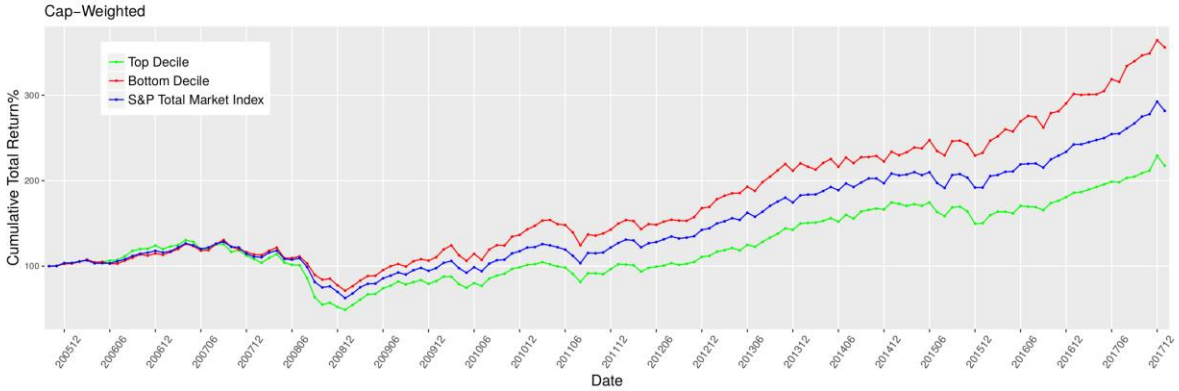
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	66.75	95.88
2	Alpha	−18.65 (−1.42)	25.29** (2.29)
3	Mkt−Rf	1.16 (32.97)	0.96 (32.29)
4	SMB	0.06 (1.04)	0.07 (1.32)
5	HML	−0.10 (−1.46)	0.14 (2.49)
6	MOM	−0.07 (−1.60)	0.12 (3.03)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increase year-o-year high credit group (top decile) underperforms

- **Factor** hicdtavg.pc12 = 12-month percentage change in “high credit average”
- **Equal-weighted**: top decile underperforms bottom decile (-41.4 basis points). **Market cap-weighted**: top decile underperforms market (-25.3 basis points)

Equal–Weighted

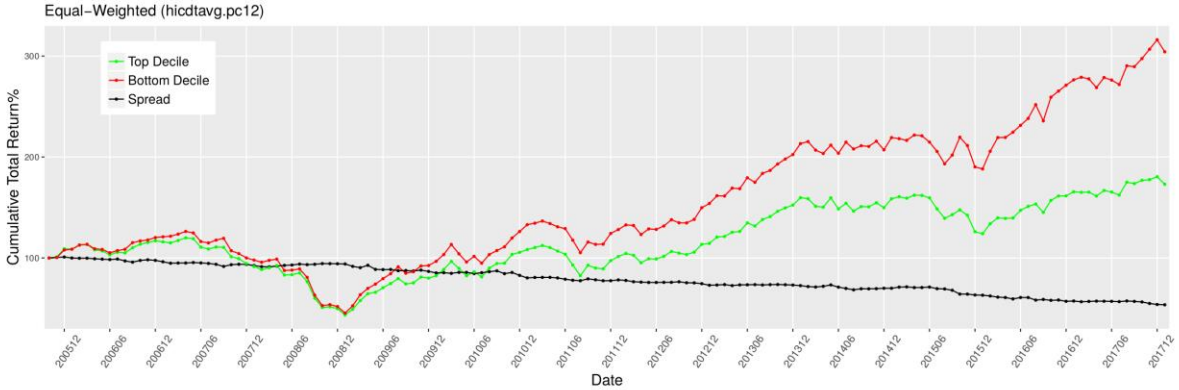
	Variable	Top–Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−39.32	52.88	92.20
2	Alpha	−41.39*** (−3.70)	−23.87* (−1.85)	17.52 (1.15)
3	Mkt–Rf	0.03 (0.84)	0.97 (28.12)	0.95 (23.11)
4	SMB	−0.00 (−0.04)	0.78 (12.89)	0.79 (10.90)
5	HML	−0.03 (−0.46)	0.15 (2.39)	0.18 (2.35)
6	MOM	0.05 (1.15)	−0.01 (−0.17)	−0.05 (−0.98)

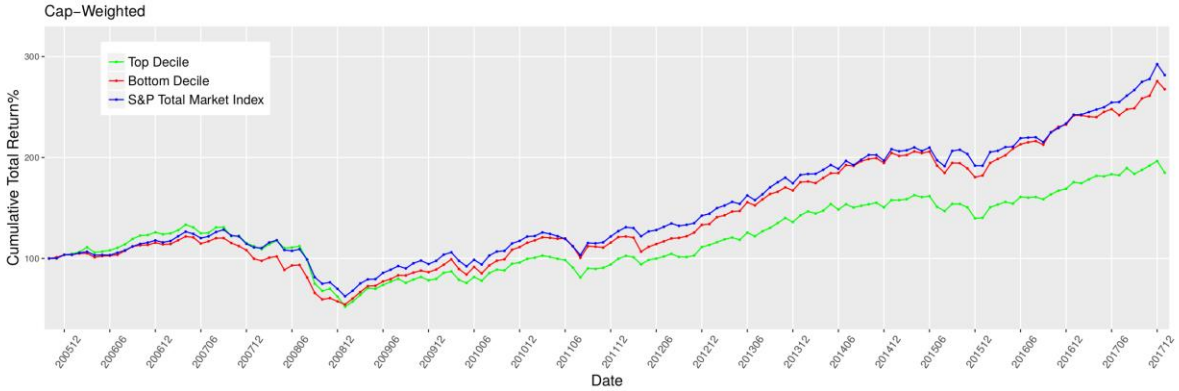
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap–Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	54.48	77.92
2	Alpha	−25.29** (−2.09)	6.54 (0.51)
3	Mkt–Rf	1.09 (33.54)	0.98 (28.22)
4	SMB	0.01 (0.23)	0.00 (0.05)
5	HML	0.13 (2.21)	0.12 (1.79)
6	MOM	0.03 (0.82)	−0.02 (−0.53)

*, **, and *** denote significance at the 10%, 5%, and 1% level





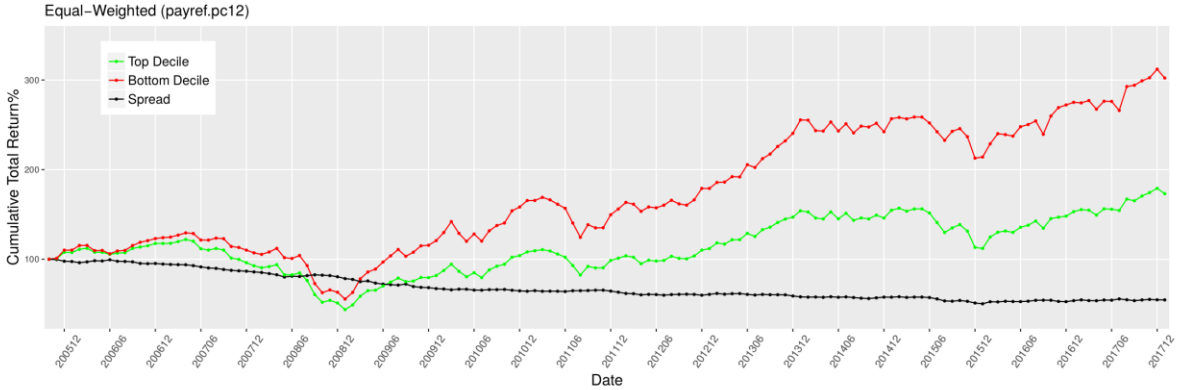
Increase year-o-year # of suppliers group (top decile) underperforms

- **Factor** payref.pc12 = 12-month percentage change in "# of suppliers"
- **Eequal-weighted**: top decile underperforms bottom decile (-40.2 basis points). **Market cap-weighted**: top decile underperforms market (-34.2 basis points) while bottom decile outperforms market (+22.7 basis points)

Equal−Weighted

	Variable	Top−Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−38.12	53.14	91.25
2	Alpha	−40.23*** (−3.55)	−22.89* (−1.88)	17.34 (1.36)
3	Mkt−Rf	0.03 (0.96)	0.97 (29.63)	0.94 (27.45)
4	SMB	−0.02 (−0.42)	0.77 (13.51)	0.80 (13.28)
5	HML	−0.04 (−0.68)	0.14 (2.36)	0.18 (2.87)
6	MOM	0.01 (0.28)	−0.06 (−1.44)	−0.07 (−1.62)

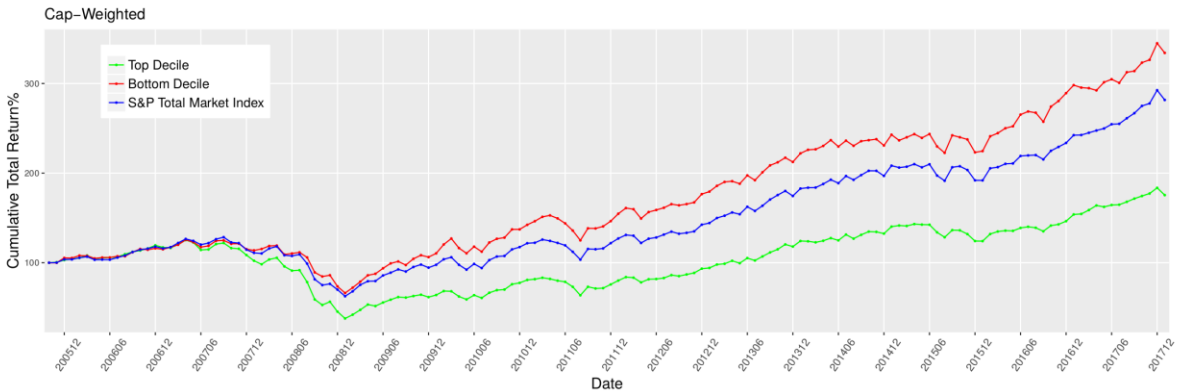
*, **, and *** denote significance at the 10%, 5%, and 1% level



Cap−Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	53.86	91.75
2	Alpha	−34.22** (−2.37)	22.65** (2.16)
3	Mkt−Rf	1.22 (31.45)	0.94 (33.40)
4	SMB	−0.12 (−1.70)	0.04 (0.82)
5	HML	0.14 (1.97)	0.27 (5.15)
6	MOM	0.01 (0.24)	0.15 (4.13)

*, **, and *** denote significance at the 10%, 5%, and 1% level



Increase year-o-year current dollars group (top decile) underperforms

- **Factor** d_cur.pc12 = 12-month percent change in "current dollars"
- **Equal-weighted**: top decile underperforms bottom decile (-37.3 basis points); **Market cap-weighted**: top decile underperforms market (-26.7 basis points)

Equal-Weighted

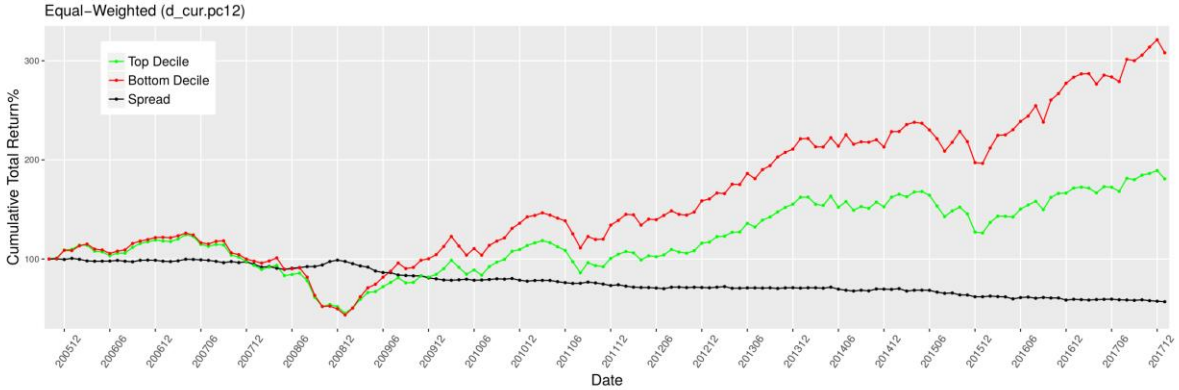
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−38.03	56.21	94.24
2	Alpha	−37.33*** (−3.27)	−20.22 (−1.55)	17.11 (1.14)
3	Mkt−Rf	−0.02 (−0.79)	0.96 (27.60)	0.99 (24.50)
4	SMB	0.08 (1.43)	0.83 (13.51)	0.75 (10.61)
5	HML	0.00 (0.01)	0.16 (2.46)	0.16 (2.12)
6	MOM	0.12 (2.87)	−0.01 (−0.16)	−0.12 (−2.32)

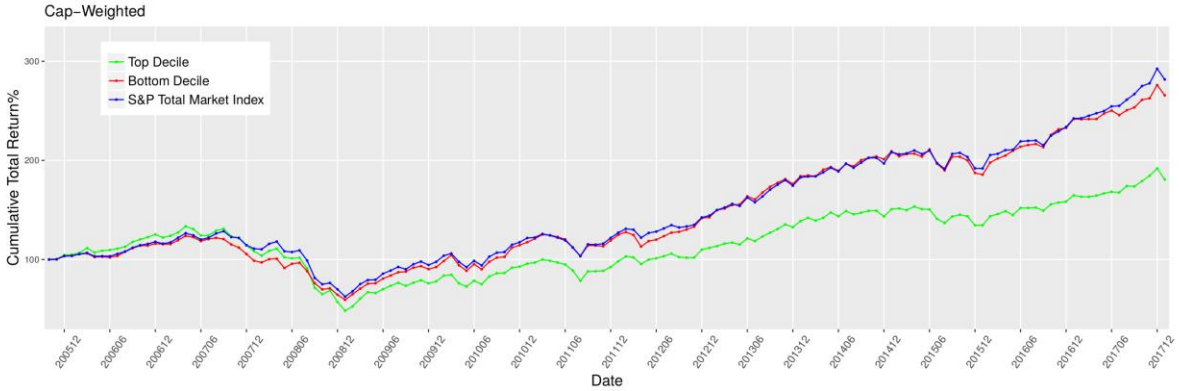
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	53.35	75.60
2	Alpha	−26.72** (−2.16)	7.61 (0.74)
3	Mkt−Rf	1.10 (33.07)	0.94 (34.07)
4	SMB	0.00 (0.06)	−0.03 (−0.61)
5	HML	0.19 (3.13)	0.17 (3.31)
6	MOM	0.04 (0.96)	0.06 (1.61)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increase year-o-year satisfactory dollars group (top decile) underperforms

- **Factor** d_sat.pc12 = 12-month percentage change in "satisfactory dollars"
- **Equal-weighted**: top decile underperforms bottom decile (-36.6 basis points). **Market cap-weighted**: top decile underperforms market (-27.4 basis points)

Equal-Weighted

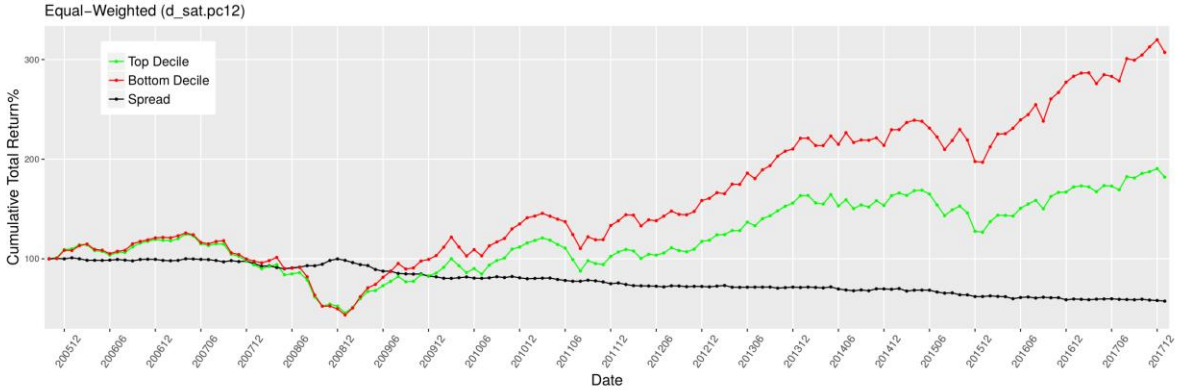
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	-37.27	56.73	93.99
2	Alpha	-36.56*** (-3.21)	-19.89 (-1.53)	16.67 (1.12)
3	Mkt-Rf	-0.02 (-0.77)	0.97 (27.75)	0.99 (24.85)
4	SMB	0.08 (1.42)	0.83 (13.51)	0.75 (10.72)
5	HML	-0.01 (-0.13)	0.15 (2.33)	0.16 (2.14)
6	MOM	0.10 (2.54)	-0.02 (-0.36)	-0.12 (-2.26)

*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	51.94	75.58
2	Alpha	-27.42** (-2.19)	7.47 (0.70)
3	Mkt-Rf	1.09 (32.52)	0.94 (32.69)
4	SMB	-0.02 (-0.29)	-0.03 (-0.51)
5	HML	0.20 (3.26)	0.17 (3.25)
6	MOM	0.04 (0.96)	0.06 (1.57)

*, **, and *** denote significance at the 10%, 5%, and 1% level



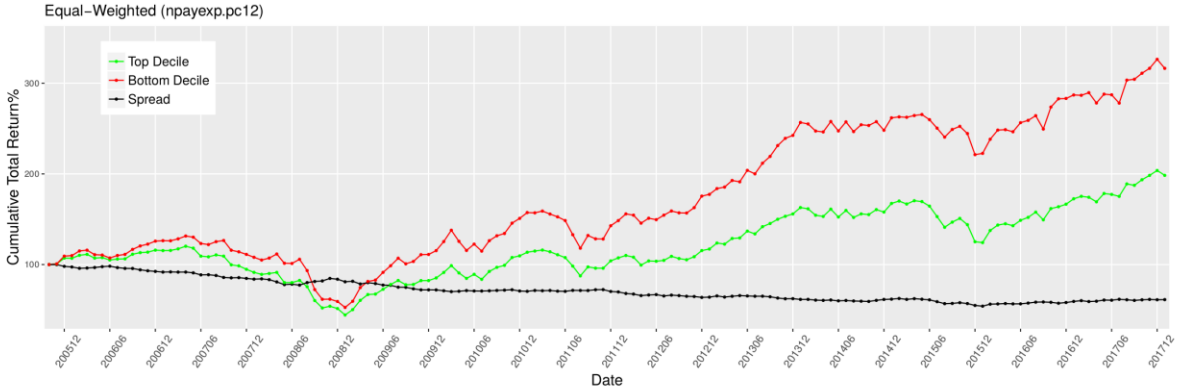
Increased year-o-year # of payment experiences group (top decile) underperforms

- **Factor** npayexp.pc12 = 12-month percentage change in "# payment experiences"
- **Equal-weighted**: top decile underperforms bottom decile (-32.1 basis points). **Market cap-weighted**: top decile underperforms market (-25.5 basis points) while bottom decile outperforms market (+22.0 basis points)

Equal-Weighted

	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	-32.87	62.11	94.98
2	Alpha	-32.12** (-2.57)	-12.14 (-0.98)	19.98 (1.60)
3	Mkt-Rf	-0.01 (-0.27)	0.95 (28.46)	0.95 (28.43)
4	SMB	-0.03 (-0.50)	0.76 (12.99)	0.79 (13.35)
5	HML	-0.07 (-1.19)	0.15 (2.46)	0.23 (3.63)
6	MOM	-0.02 (-0.34)	-0.08 (-1.80)	-0.06 (-1.43)

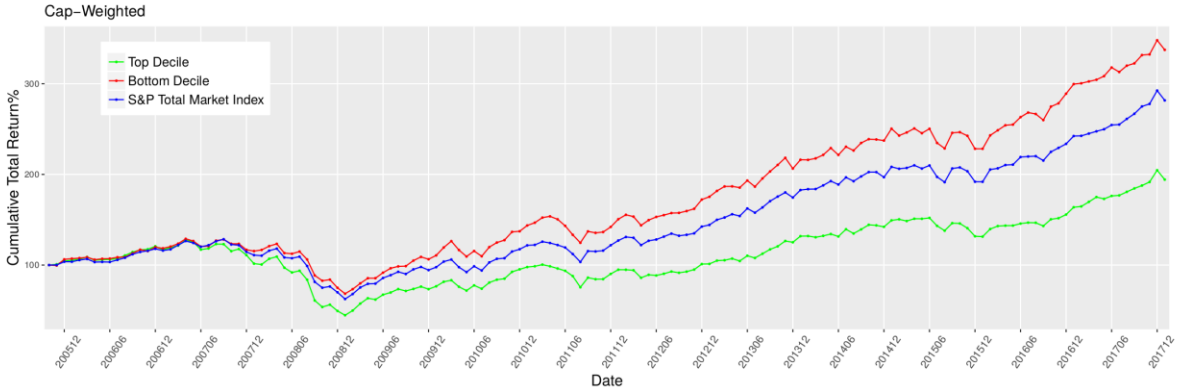
*, **, and *** denote significance at the 10%, 5%, and 1% level



Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	60.08	91.97
2	Alpha	-25.45* (-1.91)	21.96** (2.26)
3	Mkt-Rf	1.17 (32.73)	0.95 (36.52)
4	SMB	0.02 (0.39)	0.02 (0.43)
5	HML	0.05 (0.81)	0.15 (3.13)
6	MOM	-0.06 (-1.20)	0.11 (3.35)

*, **, and *** denote significance at the 10%, 5%, and 1% level



Increased monthly # of suppliers group (top decile) underperforms

- **Factor** payref.pc = 1-month percentage change in "# of suppliers"
- **Equal-weighted**: top decile underperforms bottom decile (-30.2 basis points). **Market cap-weighted**: top decile underperforms market (-30.0 basis points)

Equal-Weighted

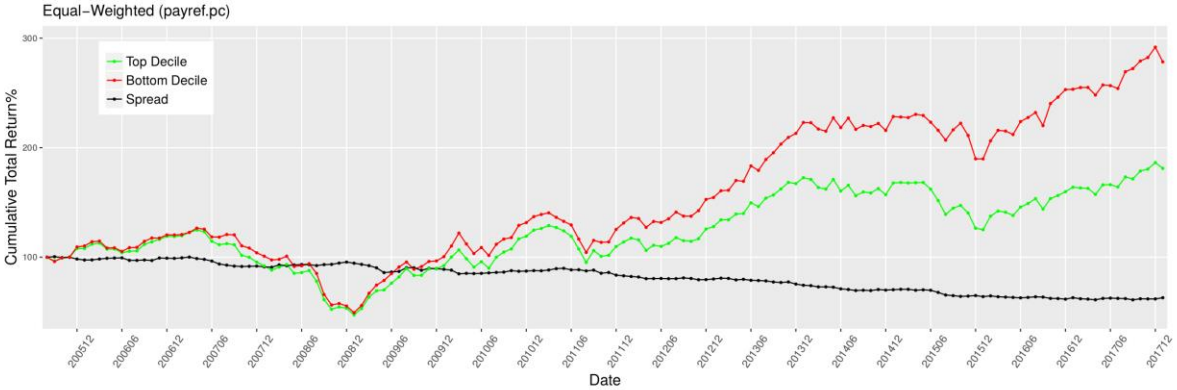
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	-28.65	55.50	84.16
2	Alpha	-30.19*** (-2.84)	-20.62* (-1.71)	9.57 (0.76)
3	Mkt-Rf	0.02 (0.57)	0.97 (29.91)	0.96 (28.30)
4	SMB	0.04 (0.70)	0.78 (13.64)	0.75 (12.53)
5	HML	-0.13 (-2.41)	0.05 (0.84)	0.18 (2.85)
6	MOM	-0.08 (-2.18)	-0.12 (-2.70)	-0.03 (-0.76)

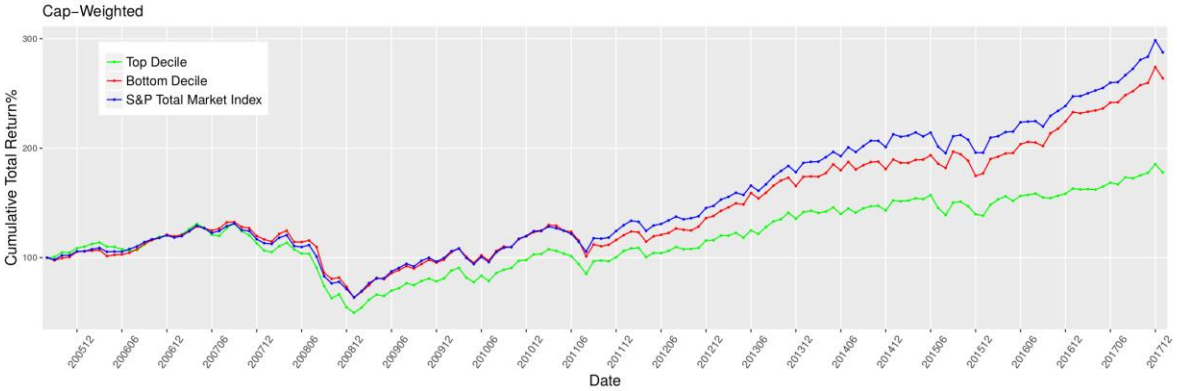
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	51.34	75.64
2	Alpha	-29.97** (-2.21)	1.47 (0.15)
3	Mkt-Rf	1.11 (30.33)	1.02 (39.38)
4	SMB	0.06 (1.01)	-0.02 (-0.41)
5	HML	0.06 (0.92)	0.21 (4.31)
6	MOM	0.03 (0.67)	0.12 (3.44)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increased monthly total dollars group (top decile) underperforms

- **Factor** totdoll.pc = 1-month percentage change in “total dollars”
- **Equal-weighted**: top decile underperforms bottom decile (-25.8 basis points). **Market cap-weighted**: bottom decile outperforms market (+30.6 basis points)

Equal–Weighted

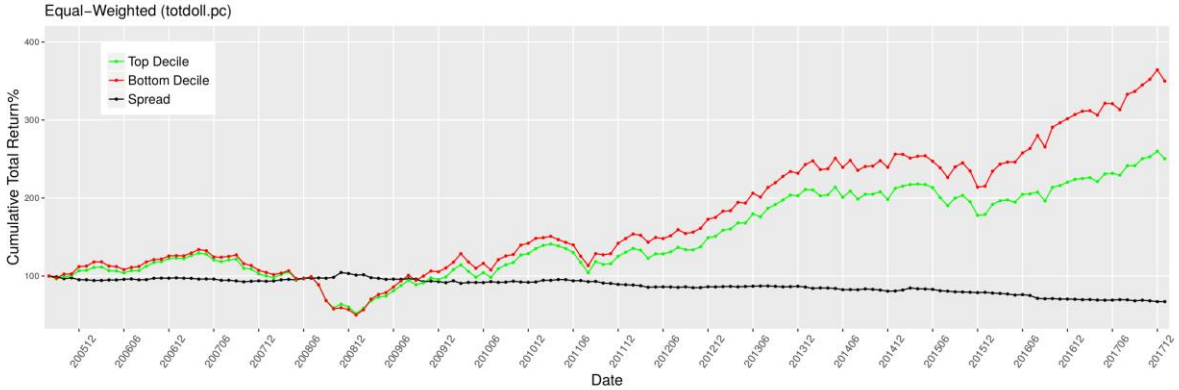
	Variable	Top–Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−23.88	77.09	100.97
2	Alpha	−25.79** (−2.32)	−3.99 (−0.38)	21.79** (2.00)
3	Mkt–Rf	0.03 (1.14)	1.05 (37.52)	1.02 (34.72)
4	SMB	−0.13 (−2.48)	0.65 (13.17)	0.78 (15.12)
5	HML	−0.01 (−0.20)	0.10 (1.95)	0.11 (2.07)
6	MOM	0.08 (2.03)	−0.02 (−0.51)	−0.10 (−2.56)

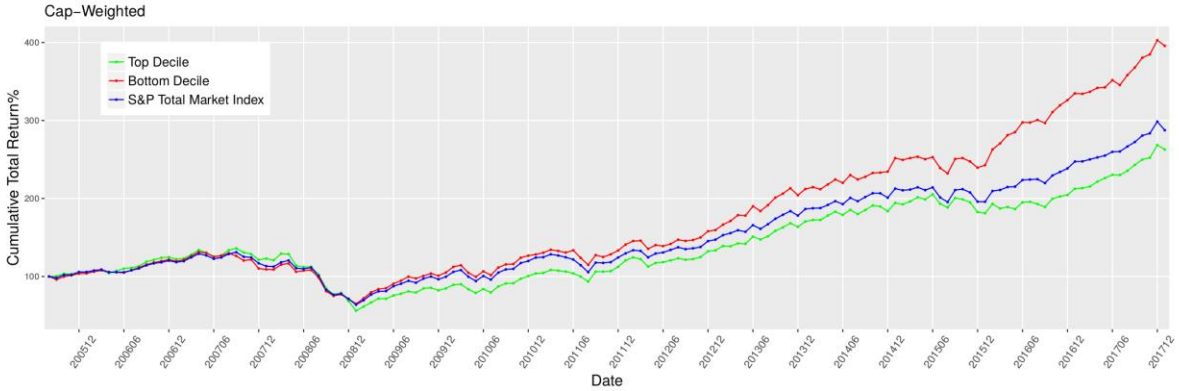
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap–Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	75.90	101.93
2	Alpha	−1.61 (−0.15)	30.62*** (3.30)
3	Mkt–Rf	1.08 (37.39)	0.98 (39.06)
4	SMB	−0.24 (−4.64)	0.00 (0.09)
5	HML	0.15 (2.78)	0.03 (0.69)
6	MOM	0.07 (1.94)	−0.01 (−0.17)

*, **, and *** denote significance at the 10%, 5%, and 1% level





Increased monthly dollars with pay manner group (top decile) underperforms

- **Factor** d_pm.pc = 1-month percentage change in “dollar with a pay manner”
- **Equal-weighted**: top decile underperforms bottom decile (-23.8 basis points). **Market cap-weighted**: bottom decile outperforms market (+33.6 basis points)

Equal-Weighted

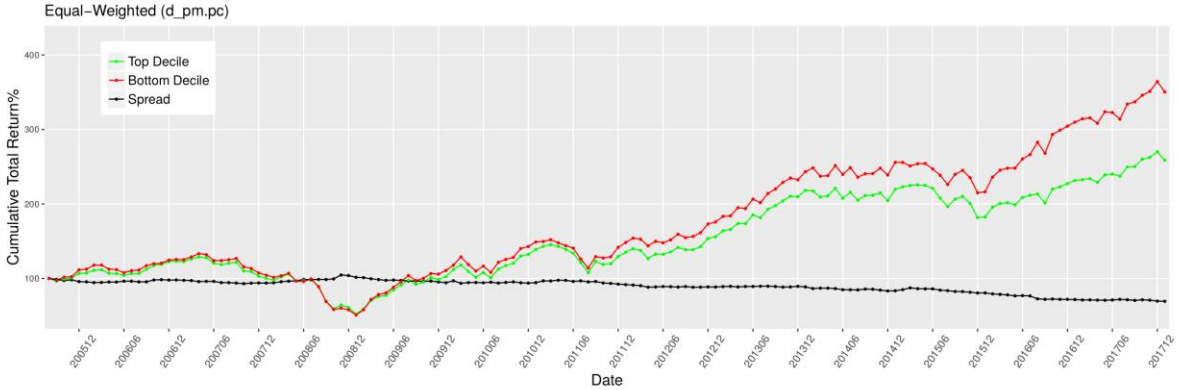
	Variable	Top-Bottom (Spread)	Top	Bottom
1	Mean Monthly Return	−21.42	79.57	100.99
2	Alpha	−23.82** (−2.33)	−1.16 (−0.12)	22.66** (2.13)
3	Mkt-Rf	0.04 (1.54)	1.05 (40.39)	1.00 (35.10)
4	SMB	−0.13 (−2.70)	0.68 (14.83)	0.81 (16.02)
5	HML	−0.01 (−0.18)	0.10 (1.98)	0.10 (1.96)
6	MOM	0.05 (1.51)	−0.06 (−1.63)	−0.11 (−2.92)

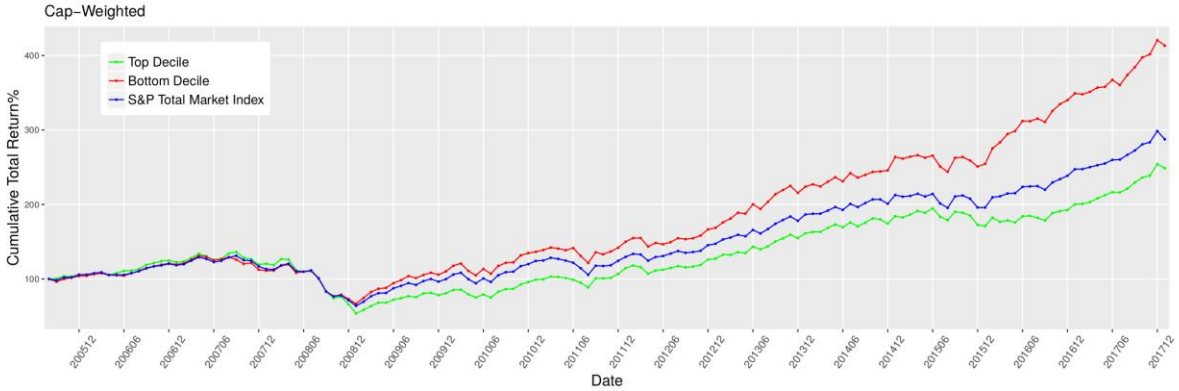
*, **, and *** denote significance at the 10%, 5%, and 1% level

Cap-Weighted

	Variable	Top	Bottom
1	Mean Monthly Return	72.45	105.02
2	Alpha	−5.87 (−0.53)	33.55*** (3.69)
3	Mkt-Rf	1.09 (36.69)	0.98 (39.87)
4	SMB	−0.23 (−4.37)	0.02 (0.47)
5	HML	0.17 (2.98)	0.06 (1.42)
6	MOM	0.08 (2.14)	0.01 (0.17)

*, **, and *** denote significance at the 10%, 5%, and 1% level





White Papers

In Depth Analysis of Equity Alpha Factors From Trade Credit Payment Data
http://www.dnb.com/perspectives/finance-credit-risk/capital-markets-study-payment-data-stock-returns.html

Payment Power and the Cross Section of Stock Returns: Does it Pay to Pay Consistently Late?
http://www.dnb.com/content/dam/english/dnb-solutions/payment-power-and-the-cross-section-of-stock-returns.pdf

The Many Rewards of Paying Bills Late
https://www.bloomberg.com/view/articles/2017-05-10/the-many-rewards-of-paying-bills-late

Explaining the variation in U.S. corporate bond credit spreads using Dun & Bradstreet data and analytics
http://www.dnb.com/content/dam/english/dnb-data-insight/explaining-credit-spreads-using-dnb-data-and-analyt

Thank You

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