A Appendix

A.1 Stocks-Specific Features

Table 1: Stock-specific Features

Feature	**Acronym**	**Reference**
Firm age	age	Jiang Lee and Zhang (2005)
Liquidity of book assets	aliq_at	Ortiz-Molina and Phillips (2014)
Liquidity of market assets	aliq_mat	Ortiz-Molina and Phillips (2014)
Amihud Measure	ami_126d	Amihud (2002)
Book leverage	at_be	Fama and French (1992)
Asset Growth	at_gr1	Cooper Gulen and Schill (2008)
Assets-to-market	at_me	Fama and French (1992)
Capital turnover	at_turnover	Haugen and Baker (1996)
Change in common equity	be_gr1a	Richardson et al. (2005)
Book-to-market equity	be_me	Rosenberg Reid and Lanstein (1985)
Market Beta	beta_60m	Fama and MacBeth (1973)
Dimson beta	beta_dimson_21d	Dimson (1979)
Frazzini-Pedersen market beta	betabab_1260d	Frazzini and Pedersen (2014)
Downside beta	betadown_252d	Ang Chen and Xing (2006)
Book-to-market enterprise value	bev_mev	Penman Richardson and Tuna (2007)
The high-low bid-ask spread	bidaskhl_21d	Corwin and Schultz (2012)
Abnormal corporate investment	capex_abn	Titman Wei and Xie (2004)
CAPEX growth (1 year)	capx_gr1	Xie (2001)
CAPEX growth (2 years)	capx_gr2	Anderson and Garcia-Feijoo (2006)
CAPEX growth (3 years)	capx_gr3	Anderson and Garcia-Feijoo (2006)
Cash-to-assets	cash_at	Palazzo (2012)
Net stock issues	chcsho_12m	Pontiff and Woodgate (2008)
Change in current operating assets	coa_gr1a	Richardson et al. (2005)
Change in current operating liabilities	col_gr1a	Richardson et al. (2005)
Cash-based operating profits-to-book assets	cop_at	
Cash-based operating profits-to-lagged book assets	cop_atl1	Ball et al. (2016)
Market correlation	corr_1260d	Asness, Frazzini, Gormsen, Pedersen (2020)
Coskewness	coskew_21d	Harvey and Siddique (2000)
Change in current operating working capital	cowc_gr1a	Richardson et al. (2005)
Net debt issuance	dbnetis_at	Bradshaw Richardson and Sloan (2006)
Growth in book debt (3 years)	debt_gr3	Lyandres Sun and Zhang (2008)
Debt-to-market	debt_me	Bhandari (1988)

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Feature	Acronym	Reference
Change gross margin minus change sales	dgp_dsale	Abarbanell and Bushee (1998)
Dividend yield	div12m_me	Litzenberger and Ramaswamy (1979)
Dollar trading volume	dolvol_126d	Brennan Chordia and Subrahmanyam (1998)
Coefficient of variation for dollar trading volume	dolvol_var_126d	Chordia Subrahmanyam and Anshuman (2001)
Change sales minus change Inventory	dsale_dinv	Abarbanell and Bushee (1998)
Change sales minus change receivables	dsale_drec	Abarbanell and Bushee (1998)
Change sales minus change SG&A	dsale_dsga	Abarbanell and Bushee (1998)
Earnings variability	earnings_variability	Francis et al. (2004)
Return on net operating assets	ebit_bev	Soliman (2008)
Profit margin	ebit_sale	Soliman (2008)
Ebitda-to-market enterprise value	ebitda_mev	Loughran and Wellman (2011)
Hiring rate	emp_gr1	Belo Lin and Bazdresch (2014)
Equity duration	eq_dur	Dechow Sloan and Soliman (2004)
Net equity issuance	eqnetis_at	Bradshaw Richardson and Sloan (2006)
Equity net payout	eqnpo_12m	Daniel and Titman (2006)
Net payout yield	eqnpo_me	Boudoukh et al. (2007)
Payout yield	eqpo_me	Boudoukh et al. (2007)
Pitroski F-score	f_score	Piotroski (2000)
Free cash flow-to-price	fcf_me	Lakonishok Shleifer and Vishny (1994)
Change in financial liabilities	fnl_gr1a	Richardson et al. (2005)
Gross profits-to-assets	gp_at	Novy-Marx (2013)
Gross profits-to-lagged assets	gp_atl1	
Intrinsic value-to-market	intrinsic_value	Frankel and Lee (1998)
Inventory growth	inv_gr1	Belo and Lin (2011)
Inventory change	inv_gr1a	Thomas and Zhang (2002)
Idiosyncratic skewness from the CAPM	iskew_capm_21d	
Idiosyncratic skewness from the Fama-French 3-factor model	iskew_ff3_21d	Bali Engle and Murray (2016)
Idiosyncratic skewness from the q-factor model	iskew_hxz4_21d	
Idiosyncratic volatility from the CAPM (21 days)	ivol_capm_21d	
Idiosyncratic volatility from the CAPM (252 days)	ivol_capm_252d	Ali Hwang and Trombley (2003)
Idiosyncratic volatility from the Fama-French 3-factor model	ivol_ff3_21d	Ang et al. (2006)
Idiosyncratic volatility from the q-factor model	ivol_hxz4_21d	
Kaplan-Zingales index	kz_index	Lamont Polk and Saa-Requejo (2001)
Change in long-term net operating assets	lnoa_gr1a	Fairfield Whisenant and Yohn (2003)
Change in long-term investments	lti_gr1a	Richardson et al. (2005)
Market Equity	market_equity	Banz (1981)

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Feature	Acronym	Reference
Mispricing factor: Management	mispricing_mgmt	Stambaugh and Yuan (2016)
Mispricing factor: Performance	mispricing_perf	Stambaugh and Yuan (2016)
Change in noncurrent operating assets	ncoa_gr1a	Richardson et al. (2005)
Change in noncurrent operating liabilities	ncol_gr1a	Richardson et al. (2005)
Net debt-to-price	netdebt_me	Penman Richardson and Tuna (2007)
Net total issuance	netis_at	Bradshaw Richardson and Sloan (2006)
Change in net financial assets	nfna_gr1a	Richardson et al. (2005)
Earnings persistence	ni_ar1	Francis et al. (2004)
Return on equity	ni_be	Haugen and Baker (1996)
Number of consecutive quarters with earnings increases	ni_inc8q	Barth Elliott and Finn (1999)
Earnings volatility	ni_ivol	Francis et al. (2004)
Earnings-to-price	ni_me	Basu (1983)
Quarterly return on assets	niq_at	Balakrishnan Bartov and Faurel (2010)
Change in quarterly return on assets	niq_at_chg1	
Quarterly return on equity	niq_be	Hou Xue and Zhang (2015)
Change in quarterly return on equity	niq_be_chg1	
Standardized earnings surprise	niq_su	Foster Olsen and Shevlin (1984)
Change in net noncurrent operating assets	nncoa_gr1a	Richardson et al. (2005)
Net operating assets	noa_at	Hirshleifer et al. (2004)
Change in net operating assets	noa_gr1a	Hirshleifer et al. (2004)
Ohlson O-score	o_score	Dichev (1998)
Operating accruals	oaccruals_at	Sloan (1996)
Percent operating accruals	oaccruals_ni	Hafzalla Lundholm and Van Winkle (2011)
Operating cash flow to assets	ocf_at	Bouchard, Krüger, Landier and Thesmar (2019)
Change in operating cash flow to assets	ocf_at_chg1	Bouchard, Krüger, Landier and Thesmar (2019)
Operating cash flow-to-market	ocf_me	Desai Rajgopal and Venkatachalam (2004)
Cash flow volatility	ocfq_saleq_std	Huang (2009)
Operating profits-to-book assets	op_at	
Operating profits-to-lagged book assets	op_atl1	Ball et al. (2016)
Operating profits-to-book equity	ope_be	Fama and French (2015)
Operating profits-to-lagged book equity	ope_bel1	
Operating leverage	opex_at	Novy-Marx (2011)
Taxable income-to-book income	pi_nix	Lev and Nissim (2004)
Change PPE and Inventory	ppeinv_gr1a	Lyandres Sun and Zhang (2008)
Price per share	prc	Miller and Scholes (1982)
Current price to high price over last year	prc_highprc_252d	George and Hwang (2004)
Quality minus Junk: Composite	qmj	Asness, Frazzini and Pedersen (2018)

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Feature	**Acronym**	**Reference**
Quality minus Junk: Growth	qmj_growth	Asness, Frazzini and Pedersen (2018)
Quality minus Junk: Profitability	qmj_prof	Asness, Frazzini and Pedersen (2018)
Quality minus Junk: Safety	qmj_safety	Asness, Frazzini and Pedersen (2018)
R&D-to-market	rd_me	Chan Lakonishok and Sougiannis (2001)
R&D-to-sales	rd_sale	Chan Lakonishok and Sougiannis (2001)
R&D capital-to-book assets	rd5_at	Li (2011)
Residual momentum t-12 to t-1	resff3_12_1	Blitz Huij and Martens (2011)
Residual momentum t-6 to t-1	resff3_6_1	Blitz Huij and Martens (2011)
Short-term reversal	ret_1_0	Jegadeesh (1990)
Price momentum t-12 to t-1	ret_12_1	Fama and French (1996)
Price momentum t-12 to t-7	ret_12_7	Novy-Marx (2012)
Price momentum t-3 to t-1	ret_3_1	Jegedeesh and Titman (1993)
Price momentum t-6 to t-1	ret_6_1	Jegadeesh and Titman (1993)
Long-term reversal	ret_60_12	De Bondt and Thaler (1985)
Price momentum t-9 to t-1	ret_9_1	Jegedeesh and Titman (1993)
Maximum daily return	rmax1_21d	Bali Cakici and Whitelaw (2011)
Highest 5 days of return	rmax5_21d	Bali, Brown, Murray and Tang (2017)
Highest 5 days of return scaled by volatility	rmax5_rvol_21d	Asness, Frazzini, Gormsen, Pedersen (2020)
Total skewness	rskew_21d	Bali Engle and Murray (2016)
Return volatility	rvol_21d	Ang et al. (2006)
Assets turnover	sale_bev	Soliman (2008)
Labor force efficiency	sale_emp_gr1	Abarbanell and Bushee (1998)
Sales Growth (1 year)	sale_gr1	Lakonishok Shleifer and Vishny (1994)
Sales Growth (3 years)	sale_gr3	Lakonishok Shleifer and Vishny (1994)
Sales-to-market	sale_me	Barbee Mukherji and Raines (1996)
Sales growth (1 quarter)	saleq_gr1	
Standardized Revenue surprise	saleq_su	Jegadeesh and Livnat (2006)
Year 1-lagged return, annual	seas_1_1an	Heston and Sadka (2008)
Year 1-lagged return, nonannual	seas_1_1na	Heston and Sadka (2008)
Years 11-15 lagged returns, annual	seas_11_15an	Heston and Sadka (2008)
Years 11-15 lagged returns, nonannual	seas_11_15na	Heston and Sadka (2008)
Years 16-20 lagged returns, annual	seas_16_20an	Heston and Sadka (2008)
Years 16-20 lagged returns, nonannual	seas_16_20na	Heston and Sadka (2008)
Years 2-5 lagged returns, annual	seas_2_5an	Heston and Sadka (2008)
Years 2-5 lagged returns, nonannual	seas_2_5na	Heston and Sadka (2008)
Years 6-10 lagged returns, annual	seas_6_10an	Heston and Sadka (2008)
Years 6-10 lagged returns, nonannual	seas_6_10na	Heston and Sadka (2008)
Change in short-term investments	sti_gr1a	Richardson et al. (2005)

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Feature	**Acronym**	**Reference**
Total accruals	taccruals_at	Richardson et al. (2005)
Percent total accruals	taccruals_ni	Hafzalla Lundholm and Van Winkle (2011)
Asset tangibility	tangibility	Hahn and Lee (2009)
Tax expense surprise	tax_gr1a	Thomas and Zhang (2011)
Share turnover	turnover_126d	Datar Naik and Radcliffe (1998)
Coefficient of variation for share turnover	turnover_var_126d	Chordia Subrahmanyam and Anshuman (2001)
Altman Z-score	z_score	Dichev (1998)
Number of zero trades with turnover as tiebreaker (6 months)	zero_trades_126d	Liu (2006)
Number of zero trades with turnover as tiebreaker (1 month)	zero_trades_21d	Liu (2006)
Number of zero trades with turnover as tiebreaker (12 months)	zero_trades_252d	Liu (2006)