Internet Appendix:
Out of Sync: Dispersed Short Selling and the Correction of Mispricing

Table A.1. Orthogonalized DESYNC and Future Returns

This table reports coefficient estimates and associated t-statistics (in parentheses) from regression equation (2) in columns (1), (2) and (5), and from regression equation (3) in columns (3), (4) and (6). In Columns (1), (2) and (5) the left-hand variable is $AR_{i,t+21}$, the Fama-French-Carhart six-factor (abnormal) future return of stock i cumulated over 21 days, while in Columns (3), (4) and (6) is a binary variable equal to 1 if stock i rises to the top tercile of the MISP (the mispricing score proposed by Stambaugh et al. (2015)) distribution in month m, and equal to 0 otherwise. In Panel A, $DESYNC^{\perp}$ denotes the residuals from regressing DESYNC on IDIO_VOL while in Panel B, $DESYNC^{\perp}$ denotes the residuals from regressing DESYNC on its lagged value. The remaining variables are: SHORT_INTEREST, the short interest in the stock; MARKET-TO-BOOK, the (log) market-to-book ratio; SIZE, the (log) market value of equity; RET_{1M}, the stock returns cumulated over a month; RET_{6M}, the stock return cumulated over six months excluding the first month; BID-ASK, the average bid-ask spread over the previous month; $Idio\ Vol$, the idiosyncratic volatility over the previous month; TURNOVER, the average turnover over the previous month; SUPPLY, the active quantity of shares available to be borrowed expressed as a percentage of shares outstanding; FEE, the borrowing fee; and VAR_FEE, the variance of the borrowing fees. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% levels.

| | Panel A: IDIO_VOL | | | | Panel B: Lagged DESYNC | |
| | Adj-Returns | | MISP | | Adj-Returns | MISP |
	1	2	3	4	5	6
$DESYNC^{\perp}$	-0.402**	-0.476***	0.442***	0.432***	-0.194*	1.281***
	(-2.40)	(-2.92)	(4.69)	(4.52)	(-1.71)	(2.93)
SHORT_INTEREST	-1.529	-1.983*	0.359	0.963	-2.708	1.056**
	(-1.36)	(-1.82)	(0.56)	(1.52)	(-2.50)	(1.67)
MARKET-TO-BOOK	0.028	0.060	-0.076***	-0.099***	0.077	-0.100***
	(0.29)	(0 .63)	(-3.04)	(-3.88)	(0.82)	(-3.89)
SIZE	-0.097***	-0.134***	-0.315***	-0.248***	-0.130***	-0.248***
	(-3.06)	(-3.90)	(-14.42)	(-11.15)	(-3.89)	(-11.15)
RET_{1M}	-0.283	-0.117	0.334***	0.119**	-0.548	0.129**
	(-0.42)	(-0.17)	(6.96)	(2.26)	(-0.75)	(2.45)
RET_{6M}	0.707***	0.618**	-0.910***	-0.805***	0.567***	-0.806***
	(2.76)	(2.44)	(-15.93)	(-14.26)	(2.33)	(-14.27)
BID-ASK	-27.961	-13.147	-93.133***	-99.249***.	3.698	-97.984***
	(-1.32)	(-0 .63)	(-5.17)	(-5.48)	(0.165)	(-5.42)
IDIO_VOL		-15.909***		23.739***	-10.313**	23.522***
		(-3.08)		(13.85)	(-2.11)	(13.62)
TURNOVER	-34.019***	-22.205*	36.363***	16.905***	-12.715	16.801***
	(-2.65)	(-1.95)	(10.24)	(4.42)	(-1.11)	(4.39)
SUPPLY	1 .030*	0.729	-3.933***	-3.682***	0.126	-3.673***
	(1.65)	(1.25)	(-11.37)	(-10.74)	(0.23)	(-10.71)
FEE	-9.877***	-9.290***	1.062	0.432	-8.747***	0440
	(-5.93)	(-5.65)	(1.06)	(0.42)	(-5.36)	(0.42)
VAR_FEE	-33.721*	-32.761*	12.787	13.414	-16.627	12.984
	(-1.80)	(-1.74)	(0.89)	(0.94)	(-0.92)	(0.91)
R^2	0.03	0.04	0.08	0.09	0.04	0.09
$Nobs$	4,759,986	4,759,986	146,232	146,232	4,758,200	146,211

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Table A.2. Impact of Offsetting Long Positions: S&P 500 Stocks

Column (1) of Panel A reports estimates from the following regression

$$\mathrm{AR}_{i,t+21} = \alpha + \beta\Big(I(\mathrm{SP500})_{i,t} \times \mathrm{DESYNC}_{i,t}\Big) + \gamma I(\mathrm{SP500})_{i,t} + \delta\mathrm{DESYNC}_{i,t} + \theta' \boldsymbol{x_{i,t}} + \epsilon_{i,t+21},$$

where $\mathrm{AR}_{i,t+21}$ is the Fama-French-Carhart six-factor (abnormal) future return of stock i cumulated over 21 days, $I(SP500)$ is a dummy variable equal to one if the stock i belongs to the SP500 on day t, DESYNC is computed as in equation (1), and $\boldsymbol{x_{i,t}}$ is a vector of control variables (see Table 5). Column (2) of Panel A reports estimates from the following regression

$$Pr\left(y_{i,m} = 1 | \boldsymbol{x}_{i,m-1}\right) = \exp\left(\boldsymbol{x}'_{i,m-1}\boldsymbol{\beta}\right) / (1 + \exp\left(\boldsymbol{x}'_{i,m-1}\boldsymbol{\beta}\right)),$$

where $y_{i,m}$ is a binary variable equal to 1 if stock i rises to the top tercile of the MISP distribution in month m. The vector of covariates $\boldsymbol{x}$ includes DESYNC, $I(\mathrm{SP500})$, their interaction and the control variables in Table 6. Panel B reports estimates from the following regression:

$$\mathrm{DELAY}_{i,t} = \alpha_i + \tau_t + \beta\Big(I(\mathrm{SP500})_{i,t} \times \mathrm{DESYNC}_{i,t}\Big) + \gamma I(\mathrm{SP500})_{i,t} + \delta\mathrm{DESYNC}_{i,t} + \boldsymbol{\theta}' \boldsymbol{x_{i,t}} + \epsilon_{i,t},$$

where α_i and τ_t are firm and time fixed-effects. In column (1) $\mathrm{DELAY}_{i,t}$ is constructed in two steps. For each stock i, we first identify the overpricing events, i.e. the months (t) when the mispricing score (Stambaugh et al. (2015)) exceeds the top tercile of the distribution. We then compute the length of the events as the number of months before the score drops below the top tercile. The vector of controls is the same as Table 8. In column (2) $\mathrm{DELAY}_{i,t}$ is the number of days the price of stock i is above the upper-bound implied by the put-call parity, and $\boldsymbol{x_{i,t}}$ is the vector of controls from Table 9. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% levels.

	Panel A: Mispricing			**Panel B: Delay**	
	AR	MISP		MISP	P-C DISPARITY
	1	2		1	2
DESYNC $\times$ $I(\mathrm{SP500})$	-0.200	0.235	DESYNC $\times$ $I(\mathrm{SP500})$	2.733	-17.028*
	(-1.227)	(0.510)		(0.61)	(-1.66)
DESYNC	-0.645***	1.049***	DESYNC	3.365**	10.892**
	(-4.230)	(7.282)		(2.03)	(2.35)
$I(\mathrm{SP500})$	0.056	-0.351	$I(\mathrm{SP500})$	-2.471	-0.546
	(0.515)	(-1.191)		(-0.90)	(-0.06)
SHORT_INTEREST	-1.859*	-0.290	R	0.777***	2.155***
	(-1.859)	(-0.450)		(12.54)	(3.80)
			FEE	3.212	30.097***
				(0.34)	(2.70)
			SHORT_INTEREST	2.489	52.776***
				(0.43)	(3.79)
Controls	YES	YES	Controls	YES	YES
Nobs	4,915,663	146,244	Nobs	3,722	3,981
R^2	0.03	0.09	R^2	0.16	0.10

Table A.3. Calendar Portfolios Value Weighted

This table presents monthly Fama-French-Carhart six-factor alphas (in %) for overlapping (Panel A) and non-overlapping returns (Panel B). Portfolios are rebalanced daily (monthly) in Panel A (Panel B), and are held for 21 days (1 month). The first five columns (*Q1* to *Q5*) in subpanels A.1 and B.1 refer to portfolios formed by sorting into quintiles using the level of DESYNC while the last column (*Q5-Q1*) shows returns to a portfolio long (short) in the stocks in the highest (lowest) quintile. Results in subpanel A.2 and B.2 refer to portfolios formed by first sorting by the level of one of the variables in the first column into quintiles, then sorting DESYNC into sub-quintiles. Each column shows returns to a long-short portfolio where firms with DESYNC in the highest (lowest) sub-quintile are assigned to the long (short) portfolio. DESYNC is the dispersion in profits across the short positions (computed as in equation 1); SIZE is the market capitalization; MARKET-TO-BOOK is the market-to-book ratio; RET_{6M} is the stock return cumulated over the previous six months; SHORT_INTEREST is the total quantity of shares loaned out as a percentage of shares outstanding; BID-ASK is the average bid-ask spread over the previous month; and TURNOVER is the average turnover over the previous month. The reported alphas are the intercept from regressing portfolio returns in excess of the risk-free rate on the excess market return (MKT), size (SMB), book-to-market (HML), momentum (MOM), profitability (RMW) and investment (CMA) factors. t-statistics are based on adjusted standard errors using Newey and West (1987) methodology to correct for autocorrelation, with a number of lags equal to the length of the holding period. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% levels.

Panel A: Overlapping Returns

A.1: Single Sort

	Q1	Q2	Q3	Q4	Q5	Q5-Q1
DESYNC	0.08**	-0.07**	-0.19***	-0.24***	-0.19*	-0.27***
	(3.12)	(2.10)	(-4.01)	(-3.53)	(-1.86)	(-2.46)

A.2: Conditional Double Sorts

	Q5-Q1	Q10-Q6	Q15-Q11	Q20-Q16	Q25-Q21
SIZE	-1.02***	-0.39**	-0.28**	-0.56***	-0.29***
	(-4.60)	(-2.37)	(-2.23)	(-4.45)	(-2.59)
MARKET-TO-BOOK	-0.72***	-0.70***	-0.42***	-0.16	-0.20
	(-3.02)	(-4.17)	(-2.87)	(-1.07)	(-0.99)
RET_{6M}	-0.82***	-0.58**	-0.47***	-0.18	-0.05
	(-3.79)	(-3.81)	(-4.29)	(-1.34)	(-0.27)
SHORT_INTEREST	-0.14*	-0.36**	-0.20	-0.35*	-0.26
	(-1.70)	(-2.16)	(-1.47)	(-1.65)	(-1.15)
BID-ASK	-0.28***	-0.26*	-0.10	-0.79***	-0.69**
	(-2.52)	(-1.77)	(-0.71)	(-3.71)	(-2.56)
TURNOVER	-0.42***	-0.15	-0.24*	-0.15	-0.54**
	(-2.55)	(-0.98)	(-1.81)	(-0.93)	(-2.53)

Panel B: Non-Overlapping Returns

B.1: Single Sort

	Q1	Q2	Q3	Q4	Q5	Q5-Q1
DESYNC	0.09**	-0.06*	-0.21***	-0.29***	-0.27**	-0.36***
	(2.24)	(-1.91)	(-4.53)	(-4.08)	(-2.53)	(-2.97)

B.2: Conditional Double Sorts

	Q5-Q1	Q10-Q6	Q15-Q11	Q20-Q16	Q25-Q21
SIZE	-1.09***	-0.48***	-0.33***	-0.61***	-0.37***
	(-5.11)	(-2.98)	(-2.73)	(-4.61)	(-2.98)
MARKET-TO-BOOK	-0.74***	-0.74***	-0.45***	-0.18	-0.38
	(-3.24)	(-4.65)	(-3.17)	(-1.21)	(-1.64)
RET_{6M}	-0.86***	-0.64***	-0.52***	-0.24*	-0.12
	(-4.00)	(-3.94)	(-4.44)	(-1.65)	(-0.57)
SHORT_INTEREST	-0.21	-0.41**	-0.32**	-0.40**	-0.39
	(-1.44)	(-2.48)	(-2.10)	(-2.02)	(-1.63)
BID-ASK	-0.36***	-0.27*	-0.20	-0.81***	-0.67**
	(-2.95)	(-1.90)	(-1.39)	(-3.75)	(-2.43)
TURNOVER	-0.42**	-0.26	-0.29**	-0.25	-0.60***
	(-2.38)	(-1.51)	(-2.20)	(-1.61)	(-2.92)

Table A.4. Sample of Put-Call Parity Violations

This table presents pooled summary statistics for the sample of options used in our empirical tests. MATURITY is the number of days until maturity; MONEYNESS is the moneyness of the option computed as the log of the ratio between market price (S) and the options' strike price (K); R is the log of the ratio between the closing stock price and the stock price derived from the options market using put-call parity; VOLUME is the (log) volume averaged across the call and put options; IMPLIED_VOL is the implied volatility of the call option; and DELAY is the number of days the price of the stock is above the upper-bound implied by put-call parity.

	mean	p50	sd	p5	p95
MATURITY	134.52	134.00	26.07	94.00	177.00
MONEYNESS ($\ln(S/K)\%$)	0.08	0.04	3.78	-6.55	6.77
R ($\ln(S/S^*)\%$)	0.25	0.06	1.30	-0.87	1.88
VOLUME	22.13	0.00	200.28	0.00	66.00
IMPLIED_VOL (%)	44.27	41.14	17.17	23.92	74.61
DELAY	8.91	3.00	25.10	2.00	32.00

Table A.5. Miller's Hypothesis and DESYNC: Triple Sort

This table presents monthly Fama-French-Carhart six-factor alphas (in percent) for equal-weighted (Panel A) and value-weighted (Panel B) portfolios. Portfolios are rebalanced daily, and are held for 21 days. Results refer to portfolios formed by independently sorting in quintiles on the level of turnover, on either FEE (left Panels) or SUPPLY (Right panels), and DESYNC for a total of 125 portfolios. Each entry shows returns to a long-short portfolio where firms with DESYNC in the highest (lowest) sub-quintile are assigned to the long (short) portfolio, keeping the other two sorting variables fixed. The reported alphas are the intercept from regressing portfolio returns in excess of the riskfree rate on the excess market return (MKT), size (SMB), book-to-market (HML), momentum (MOM), profitability (RMW) and investment (CMA) factors. t-statistics are based on adjusted standard errors using Newey and West (1987) methodology to correct for autocorrelation, with a number of lags equal to the length of the holding period. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% levels.

	Panel A: Equal-Weighted Portfolios				
	FEE			SUPPLY	
	Low (Q1)	Hi (Q5)		Low (Q1)	Hi (Q5)
TURNOVER (Q1)	-0.47**	-0.91***		-0.78***	0.35
	(-3.06)	(-3.22)		(-3.19)	(0.65)
TURNOVER (Q2)	-0.48***	-0.34		-0.39	-0.33*
	(-3.81)	(-1.13)		(-1.28)	(-1.79)
TURNOVER (Q3)	-0.26**	0.32		0.09	-0.01
	(-2.27)	(0.87)		(-0.23)	(-0.03)
TURNOVER (Q4)	-0.22**	-0.87*		-1.03***	-0.37***
	(-2.06)	(-1.9)		(-2.87)	(-2.28)
TURNOVER (Q5)	-0.45***	-1.78***		-2.93***	-0.36*
	(-3.16)	(-3.18)		(-4.66)	(-1.85)

	Panel B: Value-Weighted Portfolios				
	FEE			SUPPLY	
	Low (Q1)	Hi (Q5)		Low (Q1)	Hi (Q5)
TURNOVER (Q1)	0.1	-0.99***		-0.96***	0.25
	(0.58)	(-3.00)		(-3.53)	(0.46)
TURNOVER (Q2)	0.09	-0.92***		-0.09	-0.02
	(0.56)	(-2.81)		(-0.25)	(-0.18)
TURNOVER (Q3)	-0.28*	-0.17		-0.18	-0.18
	(-1.92)	(-0.5)		(-0.39)	(-1.05)
TURNOVER (Q4)	-0.12	-0.29		-0.12	-0.49**
	(-0.72)	(-0.91)		(-0.28)	(-2.48)
TURNOVER (Q5)	-0.477**	-1.13***		-2.29***	-0.89***
	(-2.50)	(-3.03)		(-3.79)	(-3.22)