

Internet Appendix to
**“A Tug of War: Overnight Versus Intraday
Expected Returns”**

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Table A1: Factor Betas

This table reports factor betas of momentum returns. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The first four rows report factor exposures of close-to-close momentum returns, the middle four rows report the exposures of overnight momentum returns, and the last four rows report the exposures of intraday momentum returns. In the first two columns, we include in the time-series regression monthly Fama-French factors; in the next four columns, we include in the regression the overnight and intraday versions of the Fama-French factors. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

	FF Factors		Overnight Factors		Intraday Factors	
	Close-to-Close MOM Returns					
Alpha	1.05%	(2.22)	0.56%	(1.17)	1.04%	(2.01)
Mktrf	-0.55	(-3.22)	-0.20	(-0.78)	-0.87	(-3.36)
SMB	0.19	(0.72)	-0.31	(-0.61)	0.17	(0.64)
HML	-0.36	(-1.06)	-1.02	(-1.25)	-0.68	(-1.23)
	Overnight MOM Returns					
Alpha	0.95%	(3.65)	0.86%	(3.07)	0.74%	(2.36)
Mktrf	-0.20	(-2.38)	-0.35	(-2.34)	-0.13	(-1.73)
SMB	0.18	(2.28)	-0.04	(-0.18)	0.13	(1.67)
HML	0.03	(0.29)	-0.84	(-1.51)	0.30	(1.48)
	Intraday MOM Returns					
Alpha	0.11%	(0.27)	-0.26%	(-0.69)	0.30%	(0.68)
Mktrf	-0.36	(-2.86)	0.15	(0.74)	-0.74	(-3.21)
SMB	0.00	(0.01)	-0.27	(-0.65)	0.03	(0.10)
HML	-0.35	(-1.32)	-0.07	(-0.09)	-0.90	(-1.80)

Table A2: Overnight/Intraday Momentum Returns: Subsamples

This table reports returns to the momentum strategy during the day vs. at night for the period 1993-2013. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. Panels A and B report overnight and intraday momentum returns in the following month in the first and second half of the sample period, respectively. Panels C and D report overnight and intraday momentum returns among small-cap and large-cap stocks, respectively. Panels E and F report overnight and intraday momentum returns among low-price and high-price stocks, respectively. We report monthly portfolio returns in excess of the risk-free rate, adjusted by the CAPM, and by the three-factor model. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: 1993-2002						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.20%	-0.05%	0.01%	-0.79%	-1.19%	-1.17%
	(0.50)	(-0.16)	(0.04)	(-1.22)	(-2.29)	(-1.95)
10	1.48%	1.29%	1.27%	-0.82%	-1.15%	-0.98%
	(4.95)	(5.35)	(4.92)	(-1.84)	(-3.40)	(-3.04)
10 - 1	1.28%	1.34%	1.26%	-0.03%	0.04%	0.20%
	(3.90)	(4.16)	(3.99)	(-0.06)	(0.07)	(0.29)

Panel B: 2003-2013 (excluding 2009)						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.15%	-0.21%	-0.14%	-0.26%	-0.89%	-0.95%
	(0.43)	(-0.73)	(-0.52)	(-0.51)	(-2.25)	(-2.56)
10	1.30%	1.06%	1.05%	-0.49%	-1.17%	-1.20%
	(5.01)	(4.58)	(4.56)	(-1.79)	(-4.21)	(-4.56)
10 - 1	1.16%	1.27%	1.19%	-0.23%	-0.28%	-0.25%
	(4.06)	(4.30)	(4.26)	(-0.99)	(-0.60)	(-0.55)

Panel C: Small-Cap Stocks (< NYSE Median)						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	-0.17%	-0.45%	-0.47%	0.66%	0.02%	-0.21%
	(-0.84)	(-2.86)	(-2.94)	(1.55)	(0.05)	(-0.86)
5	0.35%	0.08%	0.07%	0.78%	0.30%	0.18%
	(1.76)	(0.53)	(0.49)	(2.59)	(1.38)	(1.12)
5 - 1	0.52%	0.54%	0.54%	0.13%	0.29%	0.39%
	(4.09)	(4.31)	(4.49)	(0.46)	(1.14)	(1.59)

Panel D: Large-Cap Stocks (>= NYSE Median)						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.08%	-0.24%	-0.25%	0.07%	-0.47%	-0.53%
	(0.34)	(-1.28)	(-1.29)	(0.20)	(-1.82)	(-2.01)
5	1.00%	0.79%	0.79%	-0.39%	-0.79%	-0.77%
	(6.01)	(5.72)	(5.57)	(-1.60)	(-4.69)	(-4.60)
5 - 1	0.93%	1.03%	1.04%	-0.46%	-0.32%	-0.24%
	(5.13)	(5.92)	(5.90)	(-1.49)	(-1.06)	(-0.79)

Panel E: Low-Price Stocks (< NYSE Median)						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.33%	-0.03%	-0.09%	-0.12%	-0.75%	-0.86%
	(1.31)	(-0.14)	(-0.40)	(-0.30)	(-2.63)	(-3.02)
5	0.89%	0.60%	0.57%	0.07%	-0.43%	-0.53%
	(4.03)	(3.30)	(3.20)	(0.22)	(-1.82)	(-2.65)
5 - 1	0.56%	0.63%	0.66%	0.19%	0.33%	0.33%
	(2.89)	(3.35)	(3.59)	(0.66)	(1.13)	(1.17)

Panel F: High-Price Stocks (>= NYSE Median)						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	-0.14%	-0.42%	-0.40%	0.20%	-0.13%	-0.29%
	(-0.63)	(-2.30)	(-2.15)	(0.80)	(-0.85)	(-1.07)
5	0.95%	0.74%	0.74%	-0.22%	-0.42%	-0.70%
	(5.78)	(5.43)	(5.30)	(-1.36)	(-2.36)	(-4.28)
5 - 1	1.08%	1.16%	1.14%	-0.42%	-0.29%	-0.41%
	(6.31)	(6.77)	(6.63)	(-1.90)	(-1.56)	(-1.33)

Table A3: Other Firm Characteristics

This table reports returns to various strategies during the day vs. at night. In Panel A, at the end of each month, all stocks are sorted into deciles based on prior quarter earnings surprises (= actual earnings – consensus forecast); in Panel B, all industries are sorted into quintiles based on lagged 12-month cumulative industry returns. In Panel C, stocks are sorted into deciles based on lagged return-to-equity; in Panel D, stocks are sorted into deciles based on lagged asset growth; in Panel E, stocks are sorted into deciles based on lagged 12-month market betas (using daily returns with one lead and one lag); in Panel F, stocks are sorted into deciles based on their lagged 12-month daily idiosyncratic volatilities (with regard to the Carhart four factor model, with one lead and one lag); in Panel G, stocks are sorted into deciles based on equity issuance in the prior year; in Panel H, stocks are sorted into deciles based on lagged discretionary accruals; in Panel I, stocks are sorted into deciles based on lagged 12-month share turnover; in Panel J, stocks are sorted into deciles based on lagged one month returns. We then go long the value-weight top decile (quintile) and short the value-weight bottom decile (quintile). Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. We report monthly portfolio returns in excess of the risk-free rate, adjusted by the CAPM, and by the three-factor model. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Overnight vs. Intraday SUE Returns						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.30%	0.04%	0.02%	-0.20%	-0.70%	-0.93%
	(1.16)	(0.17)	(0.10)	(-0.47)	(-2.10)	(-3.22)
10	0.80%	0.60%	0.60%	-0.04%	-0.49%	-0.58%
	(4.08)	(3.72)	(3.74)	(-0.12)	(-2.26)	(-2.69)
10 - 1	0.49%	0.56%	0.58%	0.16%	0.21%	0.34%
	(2.98)	(3.20)	(3.23)	(0.56)	(0.70)	(1.20)

Panel B: Overnight vs. Intraday INDMOM Returns						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	-0.12%	-0.31%	-0.34%	0.52%	0.16%	0.05%
	(-0.62)	(-1.86)	(-2.05)	(1.62)	(0.66)	(0.22)
5	0.93%	0.77%	0.75%	-0.14%	-0.47%	-0.51%
	(5.08)	(4.79)	(4.73)	(-0.51)	(-2.41)	(-2.68)
5 - 1	1.05%	1.07%	1.09%	-0.66%	-0.63%	-0.56%
	(6.34)	(6.47)	(6.65)	(-2.16)	(-2.03)	(-1.92)

Panel C: Portfolios Sorted by ROE						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	1.09%	0.86%	0.88%	-0.84%	-1.36%	-1.30%
	(4.67)	(4.42)	(4.52)	(-2.24)	(-5.39)	(-5.44)
10	0.09%	-0.10%	-0.07%	0.35%	0.06%	0.13%
	(0.55)	(-0.78)	(-0.53)	(1.63)	(0.43)	(0.93)
10 - 1	-1.00%	-0.95%	-0.95%	1.19%	1.42%	1.43%
	(-6.46)	(-6.25)	(-6.22)	(4.33)	(5.58)	(6.44)

Panel D: Portfolios Sorted by INV						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.36%	0.19%	0.16%	0.25%	-0.09%	-0.19%
	(2.09)	(1.26)	(1.06)	(0.98)	(-0.53)	(-1.05)
10	0.69%	0.47%	0.52%	-0.64%	-1.06%	-0.97%
	(3.33)	(2.78)	(3.01)	(-2.04)	(-5.07)	(-4.71)
10 - 1	0.33%	0.28%	0.36%	-0.88%	-0.97%	-0.78%
	(2.49)	(2.10)	(2.85)	(-4.00)	(-4.39)	(-4.09)

Panel E: Portfolios Sorted by Market BETA						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.38%	0.17%	0.19%	-0.08%	-0.41%	-0.36%
	(1.60)	(0.80)	(0.87)	(-0.27)	(-1.74)	(-1.54)
10	0.92%	0.66%	0.68%	-0.58%	-1.11%	-1.16%
	(3.66)	(3.17)	(3.18)	(-1.53)	(-4.68)	(-4.87)
10 - 1	0.54%	0.49%	0.49%	-0.50%	-0.70%	-0.80%
	(2.43)	(2.17)	(2.10)	(-1.63)	(-2.40)	(-2.60)

Panel F: Portfolios Sorted by IVOL						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	-0.23%	-0.32%	-0.38%	0.72%	0.62%	0.53%
	(-1.75)	(-2.48)	(-3.16)	(3.67)	(3.10)	(2.83)
10	1.49%	1.15%	1.22%	-1.21%	-1.86%	-1.81%
	(4.67)	(4.48)	(4.65)	(-2.49)	(-5.79)	(-6.95)
10 - 1	1.71%	1.46%	1.61%	-1.93%	-2.48%	-2.34%
	(5.57)	(5.23)	(5.81)	(-3.86)	(-6.21)	(-7.82)

Panel G: Portfolios Sorted by Equity ISSUE						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.08%	-0.11%	-0.12%	0.56%	0.15%	0.07%
	(0.43)	(-0.72)	(-0.75)	(2.08)	(0.75)	(0.35)
10	0.67%	0.40%	0.40%	-0.48%	-0.98%	-0.98%
	(3.41)	(2.49)	(2.34)	(-1.63)	(-5.23)	(-5.13)
10 - 1	0.60%	0.52%	0.52%	-1.03%	-1.13%	-1.05%
	(3.94)	(3.27)	(3.35)	(-5.41)	(-6.13)	(-6.05)

Panel H: Portfolios Sorted by Discretionary ACCRUALS						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.11%	-0.05%	-0.10%	0.35%	-0.03%	-0.03%
	(0.78)	(-0.40)	(-0.71)	(1.55)	(-0.17)	(-0.18)
10	0.73%	0.41%	0.47%	-0.56%	-1.12%	-0.96%
	(3.19)	(2.30)	(2.52)	(-1.59)	(-4.50)	(-4.32)
10 - 1	0.62%	0.47%	0.56%	-0.90%	-1.10%	-0.94%
	(3.82)	(3.25)	(4.00)	(-3.75)	(-4.73)	(-4.95)

Panel I: Portfolios Sorted by TURNOVER						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.24%	0.08%	0.07%	0.16%	-0.11%	-0.07%
	(1.68)	(0.69)	(0.61)	(0.84)	(-0.88)	(-0.56)
10	0.61%	0.37%	0.42%	-0.23%	-0.68%	-0.59%
	(2.65)	(1.97)	(2.21)	(-0.72)	(-3.00)	(-3.19)
10 - 1	0.37%	0.29%	0.35%	-0.40%	-0.57%	-0.52%
	(2.39)	(1.98)	(2.54)	(-1.74)	(-2.58)	(-3.22)

Panel J: Portfolios Sorted by One-Month Returns						
Decile	Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	1.39%	1.06%	1.04%	-1.03%	-1.65%	-1.67%
	(5.54)	(4.95)	(4.76)	(-2.73)	(-6.15)	(-6.18)
10	0.38%	0.14%	0.16%	-0.17%	-0.60%	-0.63%
	(1.83)	(0.78)	(0.86)	(-0.60)	(-2.75)	(-2.97)
10 - 1	-1.01%	-0.93%	-0.88%	0.86%	1.05%	1.05%
	(-4.74)	(-4.28)	(-4.01)	(2.67)	(3.25)	(3.26)

Table A4: Time Series Momentum Returns

This table reports returns to the time-series momentum strategy of Moskowitz, Ooi and Pedersen (2012), during the day vs. at night for the period 1996 to 2016, for 22 equity index futures listed in Panel B. In Panel A, returns are calculated based on TRTH data, with intraday returns for each index calculated as the returns of the front futures contract, from the 30 minute VWAP centered on the “open” (defined as the minute before noon with the largest number of trades where trades are summed over all days), and the 30 minute VWAP centered on the “close” (busiest minute after noon). Overnight returns are the returns between the close on day $t-1$ and the open on day t of the front contract on date t (corresponding to rolling on expiration), with any missing data handled as with our equity data. Specifically, we split monthly returns exactly into intraday and overnight components, corresponding to returns of a strategy that aims to execute intraday and overnight round-trips, without any forward-looking information about which observations are available. Where there is a missing open price at date t , but there is a close price at date $t-1$, we define the overnight returns for day t as the percent price change between the close price at date $t-1$ and the first available open or close price on t or later, assuming such is available before contract expiration; if no such price is available, we use any one minute VWAP that is available on the last date before expiration; if no such price is available either, we assign zero to this overnight return (though this scenario is extremely rare). Similarly, if an open price is available on date t but a close price is not, we define intraday returns so that they correspond to the return of a position opened at the open on day t . All intraday, overnight or close-to-close drops of more than 30% are treated as missing, as are increases of more than 50%. From daily intraday, overnight and close-to-close returns, we aggregate to monthly returns as with our TAQ stock data used in cross-sectional momentum. The first column reports the simple monthly average return of the strategy; Column 2 reports the CAPM alpha; Column 3 reports the Fama-French 3-Factor alpha; Column 4 reports the 4-Factor alpha, which also includes the UMD factor. The last two columns report the standard deviation and skewness of the overnight and intraday returns of the time series momentum strategy. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Time Series Momentum Return Decomposition						
	Raw	CAPM	3-Factor	4-Factor	Stdev	Skew
Close-to-close	0.81%	1.29%	1.31%	1.50%	7.30%	-0.491
	(1.39)	(2.04)	(2.05)	(2.42)		
Overnight	1.10%	1.40%	1.42%	1.54%	4.24%	0.178
	(2.67)	(3.24)	(3.18)	(3.64)		
Intraday	-0.29%	-0.10%	-0.10%	-0.04%	4.85%	-2.767
	(-0.78)	(-0.24)	(-0.26)	(-0.11)		

Panel B: List of Futures Contracts

Equity Index	Start Date
AEX (Netherlands)	14-Jan-2004
JSE (South Africa)	07-Jul-2005
Athens LargeCap (Greece)	26-May-2000
S&P500 MINI (U.S)	10-Sep-1997
CAC40 (France)	07-Jan-1999
DAX (Germany)	04-Nov-2008
FTSE 100 (UK)	14-Nov-2001
SMI (Switzerland)	04-Nov-2008
HANG SENG (Hong Kong)	04-Sep-2000
FTSE/MIB (Italy)	23-Mar-2004
BMFBOVESPA (Brazil)	15-Dec-2009
IPC (Mexico)	28-Jun-1999
TOPIX (Japan)	12-Jun-2001
KOSPI 200 (Korea)	13-Jan-1997
IBEX35 (Spain)	09-Jan-1996
RTS INDEX (Russia)	03-Oct-2006
CNX NIFTY (India)	11-Oct-2005
MSCI SINGAPORE	18-Jan-2005
Eurostoxx 50 (Europe)	04-Nov-2008
S&P Canada 60	10-Sep-1999
Taiwan	14-Jun-2000
SPI200 (Australia)	03-May-2000

Table A5: News Announcements

This table reports returns to various strategies during the day vs. at night around news announcements. In Panel A, we examine overnight and intraday returns to these strategies (described below) in the three days (t-1 to t+1) around FOMC announcements. In Panel B, we show the differences in overnight and intraday returns between months with and without firm-specific news announcements. News months are defined as those with earnings announcements or news coverage in Dow Jones Newswire. For both panels, in row 1, at the end of each month, all stocks are sorted into deciles based on prior quarter earnings surprises (= actual earnings – consensus forecast). In row 2, stocks are sorted into deciles based on lagged return-to-equity; in row 3, stocks are sorted into deciles based on lagged asset growth; in row 4, stocks are sorted into deciles based on lagged 12-month market betas (using daily returns with one lead and one lag); in row 5, stocks are sorted into deciles based on their lagged 12-month daily idiosyncratic volatilities (with regard to the Carhart four factor model, with one lead and one lag); in row 6, stocks are sorted into deciles based on equity issuance in the prior year; in row 7, stocks are sorted into deciles based on lagged discretionary accruals; in row 8, stocks are sorted into deciles based on lagged 12-month share turnover; in row 9, stocks are sorted into deciles based on lagged one month returns. We then go long the value-weight top decile (quintile) and short the value-weight bottom decile (quintile). Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Returns around FOMC Announcements					
	Close-to-Close _t	Intraday _t	Overnight _t	Intraday _{t-1}	Overnight _{t+1}
SUE	-0.07% (-1.02)	0.02% (0.34)	-0.18% (-1.64)	0.05% (0.77)	0.07% (1.44)
ROE	-0.07% (-1.02)	-0.10% (-1.03)	0.02% (0.27)	0.16% (1.59)	-0.06% (-1.52)
INV	0.06% (1.00)	0.08% (1.53)	-0.02% (-0.37)	-0.13% (-1.48)	0.03% (0.88)
BETA	0.38% (3.19)	0.14% (2.44)	0.23% (2.21)	-0.03% (-0.35)	0.06% (0.77)
IVOL	0.28% (2.27)	0.21% (3.53)	0.09% (0.83)	-0.29% (-1.81)	0.12% (1.72)
ISSUE	0.13% (2.41)	0.07% (1.43)	0.06% (1.34)	-0.17% (-1.02)	-0.02% (-0.77)
ACCRUALS	0.09% (1.33)	0.09% (0.91)	0.01% (0.21)	-0.11% (-1.81)	0.08% (1.75)
TURNOVER	0.15% (1.78)	0.12% (1.77)	0.01% (0.12)	-0.17% (-1.34)	0.11% (1.37)
STR	-0.02% (-0.18)	-0.06% (-1.30)	0.02% (0.25)	0.18% (1.13)	-0.04% (-0.56)

Panel B: News vs. No-News Months

	Overnight Return	Intraday Return
SUE	0.15% (0.42)	-0.14% (-0.31)
ROE	-0.26% (-1.08)	0.42% (1.20)
INV	0.17% (0.86)	-0.23% (-0.80)
BETA	-0.08% (-0.36)	-0.02% (-0.05)
IVOL	0.50% (1.95)	0.36% (1.12)
ISSUE	0.25% (0.95)	-0.09% (-0.28)
ACCRUALS	0.33% (0.91)	0.10% (0.25)
TURNOVER	-0.32% (-1.09)	0.58% (1.64)
STR	-0.19% (-0.69)	-0.08% (-0.22)

Table A6: Overnight/Intraday Momentum, Controlling for IVOL

This table reports returns to the momentum strategy during the day vs. at night after controlling for idiosyncratic volatility. In Panels A and B, at the end of each month, all stocks are independently sorted into a 5 by 5 matrix based on lagged 12-month daily idiosyncratic volatilities (with regard to the Carhart four factor model, with one lead and one lag to incorporate non-synchronous trading) and lagged 12-month cumulative returns (skipping the most recent month). Panel A reports the value-weight overnight returns to these 25 portfolios in the following month. Panel B reports the value-weight intraday returns to these portfolios in the following month. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. In Panel C, we further exclude stocks whose lagged 12-month idiosyncratic volatility (IVOL) is in the top NYSE IVOL quintile; the remaining stocks are then sorted into deciles based on their lagged 12-month cumulative returns. Reported below are the monthly portfolio returns in excess of the risk-free rate. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Overnight Returns					
IVOL					
MOM	1	2	3	4	5
1	-0.65%	-0.33%	-0.11%	-0.08%	0.63%
	(-2.19)	(-1.29)	(-0.42)	(-0.29)	(2.29)
5	-0.03%	0.58%	0.74%	1.19%	1.52%
	(-0.13)	(3.66)	(3.95)	(5.80)	(5.12)
5 - 1	0.78%	0.92%	0.85%	1.27%	0.89%
	(2.16)	(3.84)	(3.37)	(5.52)	(4.09)

Panel B: Intraday Returns					
IVOL					
MOM	1	2	3	4	5
1	0.63%	1.11%	0.38%	0.14%	-0.87%
	(1.89)	(2.42)	(0.94)	(0.36)	(-1.73)
5	0.84%	0.09%	-0.22%	-0.50%	-0.67%
	(2.59)	(0.38)	(-0.82)	(-1.62)	(-1.65)
5 - 1	0.19%	-1.02%	-0.60%	-0.64%	0.19%
	(0.43)	(-2.38)	(-1.68)	(-1.84)	(0.56)

Panel C: Excluding stocks with high IVOL

Overnight MOM Returns

Decile	Excess	CAPM	3-Factor
1	-0.05% (-0.15)	-0.30% (-1.05)	-0.29% (-0.99)
2	-0.16% (-0.74)	-0.36% (-1.89)	-0.40% (-1.91)
3	-0.23% (-1.23)	-0.41% (-2.51)	-0.47% (-2.99)
4	-0.13% (-0.79)	-0.29% (-2.10)	-0.32% (-2.38)
5	-0.25% (-1.60)	-0.39% (-2.85)	-0.41% (-3.11)
6	-0.07% (-0.44)	-0.20% (-1.43)	-0.27% (-1.98)
7	0.00% (0.02)	-0.14% (-1.11)	-0.18% (-1.42)
8	0.12% (0.80)	-0.04% (-0.30)	-0.08% (-0.58)
9	0.37% (2.43)	0.23% (1.74)	0.19% (1.47)
10	1.14% (6.38)	0.97% (6.28)	0.96% (6.18)
10 – 1	1.19% (4.04)	1.26% (4.37)	1.25% (4.28)

Table A7: Fama-MacBeth Return Regressions

This table reports Fama-MacBeth regressions of monthly stocks returns on lagged firm characteristics. The dependent variable in the first column is the close-to-close return in the following month; the dependent variable in the second column is the overnight return in the following month, and that in the last column is the intraday return in the following month. The main independent variables include the most recent one month overnight return (*RET_NIGHT*), the most recent one month intraday return (*RET_DAY*), the exponentially weighted moving average (*EWMA_NIGHT*) overnight return (with a half-life to 60 months and skipping the most recent month), the exponentially weighted moving average (*EWMA_DAY*) intraday return (with a half-life to 60 months and skipping the most recent month), the lagged 12-month cumulative stock return (skipping the most recent month), market capitalization, book-to-market ratio, 12-month daily idiosyncratic volatility (with regard to the Carhart four factor model, with one lead and one lag), 12-month market beta (using daily returns with one lead and one lag), 12-month share turnover, return-on-equity, asset growth, equity issuance, and discretionary accruals. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. Stock returns are expressed in percentage terms. Observations are weighted by lagged market capitalization in each cross sectional regression. Standard errors, shown in brackets, are adjusted for serial-dependence with 12 lags. *, **, *** denote statistical significance at the 90%, 95%, and 99% level, respectively.

X 100	Close-to- Close	Overnight	Intraday
	[1]	[2]	[3]
<i>RET_NIGHT</i>	-0.161 [0.697]	4.585*** [0.480]	-4.792*** [0.574]
<i>RET_DAY</i>	-2.959*** [0.686]	-7.444*** [0.863]	4.484*** [0.724]
<i>EWMA_NIGHT</i>	-4.910 [4.228]	16.836*** [2.804]	-21.685*** [4.155]
<i>EWMA_DAY</i>	-2.456 [3.566]	-15.564*** [4.551]	13.583*** [4.002]
<i>MOM</i>	0.232 [0.284]	0.640*** [0.143]	-0.415** [0.186]
<i>SIZE</i>	-0.076 [0.056]	0.141*** [0.028]	-0.227*** [0.042]
<i>BM</i>	0.028 [0.074]	0.148*** [0.054]	-0.120* [0.071]
<i>IVOL</i>	-0.045 [0.097]	0.165** [0.075]	-0.149** [0.063]
<i>BETA</i>	-0.073 [0.171]	0.125 [0.119]	-0.200* [0.111]
<i>TURNOVER</i>	0.102* [0.061]	0.197*** [0.044]	-0.124*** [0.038]
<i>ROE</i>	0.214 [0.250]	-0.214** [0.105]	0.427* [0.244]
<i>INV</i>	-0.531** [0.210]	0.001 [0.100]	-0.542** [0.197]
<i>ISSUE</i>	-0.878*** [0.279]	-0.238 [0.217]	-0.635*** [0.210]
<i>ACCRUALS</i>	-0.403 [0.477]	-0.239 [0.283]	-0.210 [0.434]
Adj-R ²	0.128	0.106	0.135
No. Obs.	454,825	454,825	454,825

Table A8: Overnight/Intraday Return Components: International Evidence

This table reports returns to the short-term reversal (STR) strategy during the day vs. at night for the period 1996-2013 in nine foreign markets: Canada (North America), France, Germany, Italy, United Kingdom (Europe), Australia, Hong Kong, Japan (Asia-Pacific), and South Africa (Africa). At the end of each month, all stocks are sorted into deciles based on their past one month close-to-close (Columns 1-2), overnight (Columns 3-4), and intraday (Columns 5-6) returns. We then go long the value-weight winner decile and short the value-weight loser decile. Columns 1, 3, and 5 report the overnight long-short STR returns in the following month. Columns 2, 4 and 6 report the intraday STR returns in the following month. We exclude stocks whose market capitalization is below the 50th percentile of the sample (i.e., focusing solely on large-cap stocks). In the last two rows, we average the STR strategy returns across all countries, based on either equal weights or weights that are proportional to the total market value. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Global Overnight/Intraday Return Components						
	Close-to-Close _{t-1}		Overnight _{t-1}		Intraday _{t-1}	
	Overnight _t	Intraday _t	Overnight _t	Intraday _t	Overnight _t	Intraday _t
Canada	-0.65%	0.85%	2.35%	-1.62%	-3.51%	2.76%
	(-1.64)	(2.58)	(6.10)	(-5.26)	(-9.55)	(8.35)
France	-0.83%	1.45%	2.62%	-1.56%	-3.78%	3.59%
	(-2.02)	(3.08)	(6.70)	(-3.96)	(-10.25)	(8.02)
Germany	-1.28%	1.29%	3.62%	-4.85%	-4.65%	5.24%
	(-2.80)	(2.37)	(7.62)	(-9.25)	(-10.77)	(8.79)
Italy	-1.11%	2.26%	2.03%	-2.02%	-3.78%	3.81%
	(-1.49)	(3.14)	(2.74)	(-3.36)	(-6.72)	(5.03)
UK	-0.45%	0.05%	3.08%	-2.84%	-3.12%	2.29%
	(-0.95)	(0.10)	(6.31)	(-6.12)	(-7.11)	(4.68)
Australia	-0.32%	0.57%	3.21%	-2.89%	-2.99%	3.82%
	(-0.67)	(1.17)	(6.09)	(-6.34)	(-6.52)	(5.80)
Hong Kong	0.12%	-0.22%	1.70%	-2.02%	-2.70%	1.70%
	(0.22)	(-0.53)	(4.05)	(-6.02)	(-5.32)	(5.21)
Japan	-0.71%	0.65%	2.00%	-1.65%	-1.98%	1.92%
	(-1.26)	(1.03)	(3.87)	(-2.86)	(-4.68)	(3.11)
South Africa	-1.79%	1.44%	1.29%	-1.67%	-2.66%	2.28%
	(-4.74)	(2.58)	(3.38)	(-3.92)	(-7.57)	(4.80)
All Countries	-0.86%	0.98%	2.40%	-2.27%	-3.20%	2.99%
	(-3.62)	(3.90)	(10.04)	(-13.56)	(-15.85)	(12.18)
All Countries (Weighted)	-0.84%	0.87%	2.31%	-2.20%	-3.01%	2.80%
	(-3.35)	(2.82)	(6.90)	(-8.72)	(-9.42)	(6.23)

Table A9: Institutional Trading and Contemporaneous Returns

This table reports Fama-MacBeth regressions of changes in institutional ownership on contemporaneous stock returns. The dependent variable is the change in the fraction of shares outstanding held by all institutional investors. The independent variable in column 1 is the cumulative overnight return measured in the contemporaneous period, and that in column 2 is the cumulative intraday return in the same period. Column 3 reports the difference between the coefficients on overnight vs. intraday cumulative returns. Panel A uses quarterly changes in institutional ownership as reported in 13-F filings. Panel B uses daily changes in institutional ownership as inferred from large trades in the TAQ database (following Campbell, Ramadorai and Schwartz, 2008). Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. We further sort stocks into five quintiles based on institutional ownership at the beginning of the quarter and conduct the same regression for each IO quintile. Standard errors, shown in brackets, are adjusted for serial-dependence with 12 lags. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Quarterly Change in IO			
DepVar = Contemporaneous Qtrly Change in Institutional Ownership			
IO	Overnight Return	Intraday Return	Overnight – Intraday
1	-0.003 [0.007]	0.030* [0.017]	-0.033 [0.022]
2	-0.001 [0.005]	0.055*** [0.003]	-0.056*** [0.005]
3	0.000 [0.003]	0.073*** [0.004]	-0.073*** [0.005]
4	-0.005 [0.003]	0.071*** [0.009]	-0.077*** [0.007]
5	-0.008 [0.006]	0.070*** [0.010]	-0.077*** [0.006]
5-1	-0.005 [0.008]	0.039* [0.023]	-0.044* [0.027]

Panel B: Daily Change in IO

DepVar = Contemporaneous Daily Change in Institutional Ownership

IO	Overnight Return	Intraday Return	Overnight –Intraday
1	0.177*** [0.041]	0.159*** [0.019]	0.018 [0.040]
2	0.119*** [0.024]	0.395*** [0.053]	-0.276*** [0.038]
3	0.142*** [0.024]	0.705*** [0.062]	-0.563*** [0.067]
4	0.166*** [0.031]	0.997*** [0.086]	-0.830*** [0.082]
5	0.130*** [0.039]	1.254*** [0.116]	-1.123*** [0.104]
5-1	-0.047 [0.051]	1.095*** [0.078]	-1.141*** [0.062]

Table A10: Overnight/Intraday Momentum Returns: International Evidence

This table reports returns to momentum strategies during the day vs. at night for the period 1996-2013 in nine markets and four regions: Canada (North America), France, Germany, Italy, United Kingdom (Europe), Australia, Hong Kong, Japan (Asia-Pacific), and South Africa (Africa). At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Panel A reports stock momentum returns in each of the nine markets. Columns 1 and 4 report the close-to-close long-short momentum returns in the following month. Columns 2 and 5 report the overnight, while Columns 3 and 6 the intraday momentum returns in the following month. In the first three columns, we exclude stocks whose market capitalization is below the 10th percentile of the sample. In the next three columns, we exclude stocks whose market capitalization is below the 50th percentile of the sample (i.e., large-cap stocks). Panel B reports industry momentum returns (based on 2-digit SIC codes) in each of the four regions. We also report the average stock/industry momentum returns across all markets/regions. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Global Price Momentum Returns						
	Full Sample			Large-Cap Stocks		
	Close-to-Close	Overnight	Intraday	Close-to-Close	Overnight	Intraday
Canada	1.45% (2.23)	-0.10% (-0.19)	1.34% (2.39)	1.14% (2.19)	1.00% (2.41)	0.14% (0.29)
France	1.13% (1.42)	-0.78% (-1.31)	1.84% (4.15)	1.01% (1.75)	0.37% (0.87)	0.73% (1.38)
Germany	1.83% (2.19)	-0.59% (-1.08)	2.49% (4.55)	1.43% (1.73)	-0.09% (-0.16)	1.60% (2.55)
Italy	1.86% (2.62)	0.30% (0.51)	1.37% (3.72)	1.55% (2.11)	1.17% (2.23)	0.38% (0.77)
UK	1.18% (1.93)	0.32% (0.98)	0.71% (1.71)	1.10% (1.46)	0.86% (2.16)	0.28% (0.44)
Australia	1.93% (3.17)	0.75% (1.76)	1.15% (3.08)	1.68% (2.50)	1.37% (2.89)	0.30% (0.76)
Hong Kong	0.07% (0.11)	0.01% (0.03)	0.10% (0.18)	0.57% (0.86)	0.04% (0.07)	0.54% (1.02)
Japan	0.43% (0.76)	-0.02% (-0.04)	0.45% (1.65)	0.76% (1.34)	0.62% (1.69)	0.15% (0.47)
South Africa	2.29% (2.91)	1.61% (2.94)	0.75% (1.17)	2.25% (2.65)	1.76% (3.00)	0.53% (0.77)
All Countries	1.42% (3.22)	0.23% (0.84)	1.12% (4.73)	1.37% (3.07)	0.81% (3.20)	0.59% (2.16)
All Countries (Weighted)	1.28% (2.55)	0.23% (0.58)	0.96% (3.62)	1.24% (2.17)	0.80% (2.50)	0.44% (1.24)

Panel B: Global Industry Momentum Returns

	Close-to-Close	Overnight	Intraday
North America	1.05% (2.16)	0.95% (2.67)	0.05% (0.17)
Europe	0.87% (2.04)	0.67% (2.72)	0.19% (0.73)
Asia	0.06% (0.11)	0.09% (0.24)	0.03% (0.10)
Africa	2.18% (2.70)	1.98% (3.13)	0.30% (0.48)
All Regions	1.01% (2.67)	0.90% (3.35)	0.14% (0.63)

Table A11: Overnight/Intraday Momentum Returns: 1927-1962

This table reports returns to the momentum strategy during the day vs. at night for the period 1927-1962. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. We report the close-to-close, overnight and intraday momentum returns in the following month. Panel A reports momentum returns for the full sample. Panel B reports momentum returns for large cap stocks (i.e., whose market capitalization is above the NYSE median cut-off). We report monthly portfolio returns in excess of the risk-free rate, adjusted by the CAPM, and by the three-factor model. T-statistics, shown in parentheses, are computed based on standard errors corrected for serial-dependence with 12 lags. 5% statistical significance is indicated in bold.

Panel A: Full Sample									
Decile	Close-to-Close			Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.48%	-0.86%	-0.94%	1.55%	1.18%	1.14%	-0.84%	-1.74%	-1.79%
	(0.82)	(-3.67)	(-4.36)	(6.09)	(5.70)	(5.77)	(-1.94)	(-7.44)	(-7.98)
10	1.23%	0.48%	0.50%	1.56%	1.35%	1.36%	-0.25%	-0.78%	-0.77%
	(3.63)	(2.89)	(3.02)	(9.45)	(9.08)	(9.07)	(-0.92)	(-4.19)	(-4.19)
10 - 1	0.75%	1.34%	1.45%	0.01%	0.18%	0.21%	0.59%	0.96%	1.03%
	(1.70)	(3.97)	(4.43)	(0.06)	(0.78)	(0.97)	(1.64)	(3.07)	(3.43)

Panel B: Large-Cap Stocks									
Decile	Close-to-Close			Overnight			Intraday		
	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor	Excess	CAPM	3-Factor
1	0.35%	-0.80%	-0.86%	1.38%	1.06%	1.03%	-0.91%	-1.71%	-1.74%
	(0.72)	(-4.77)	(-5.41)	(6.76)	(6.46)	(6.35)	(-2.40)	(-8.71)	(-8.97)
10	1.22%	0.50%	0.53%	1.57%	1.37%	1.38%	-0.31%	-0.82%	-0.79%
	(3.61)	(2.87)	(3.07)	(9.59)	(9.31)	(9.31)	(-1.14)	(-4.40)	(-4.37)
10 - 1	0.86%	1.30%	1.39%	0.20%	0.31%	0.34%	0.60%	0.90%	0.95%
	(2.27)	(4.31)	(4.74)	(1.10)	(1.83)	(2.05)	(1.88)	(3.23)	(3.51)

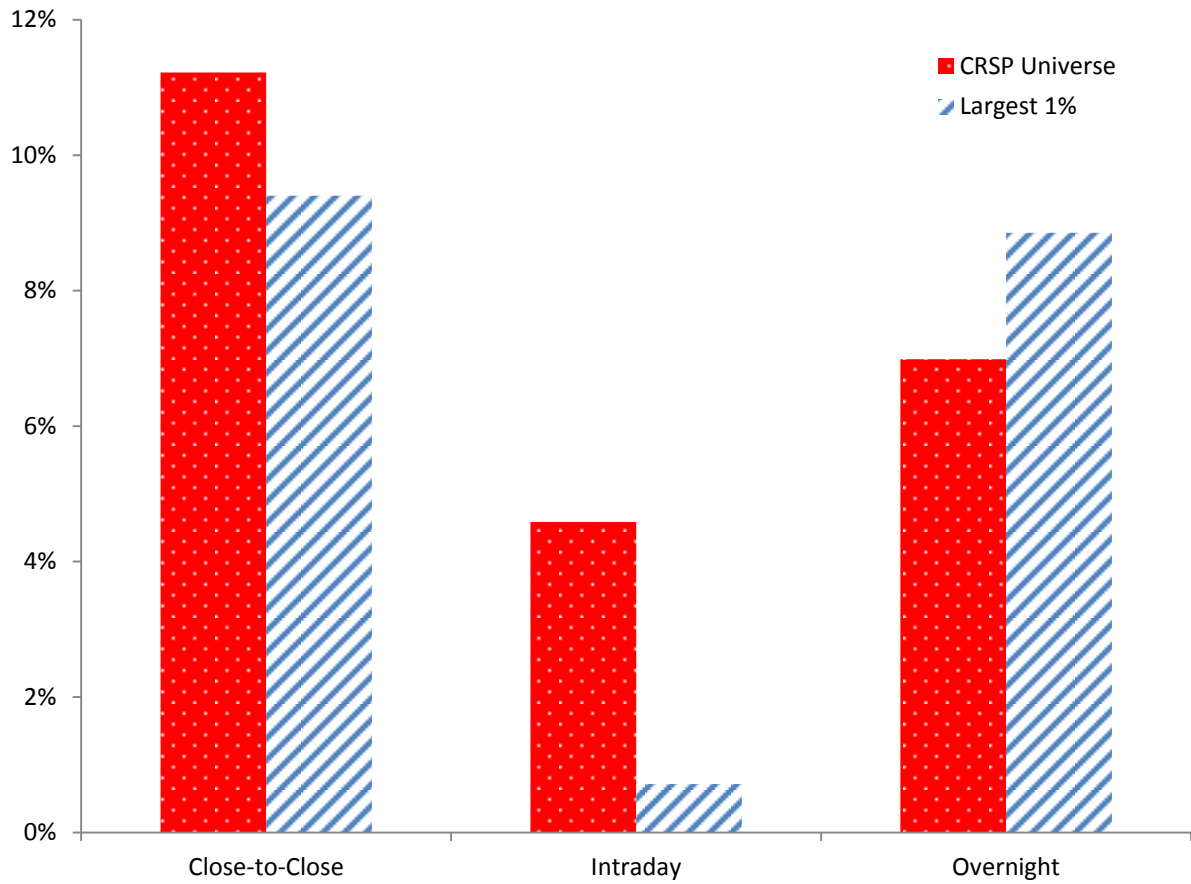


Figure A1: This figure shows the average monthly returns of the value-weight market portfolio for the period 1993-2013. The first two bars show the average close-to-close market return. The next two bars show the average intraday market return, and the last two bars show the average overnight market return. The red solid bars correspond to the value-weight CRSP index and the blue wide-upward-diagonal bars correspond to the value-weight portfolio that only includes stocks whose market capitalization is above the 99th percentile of the NYSE sample.

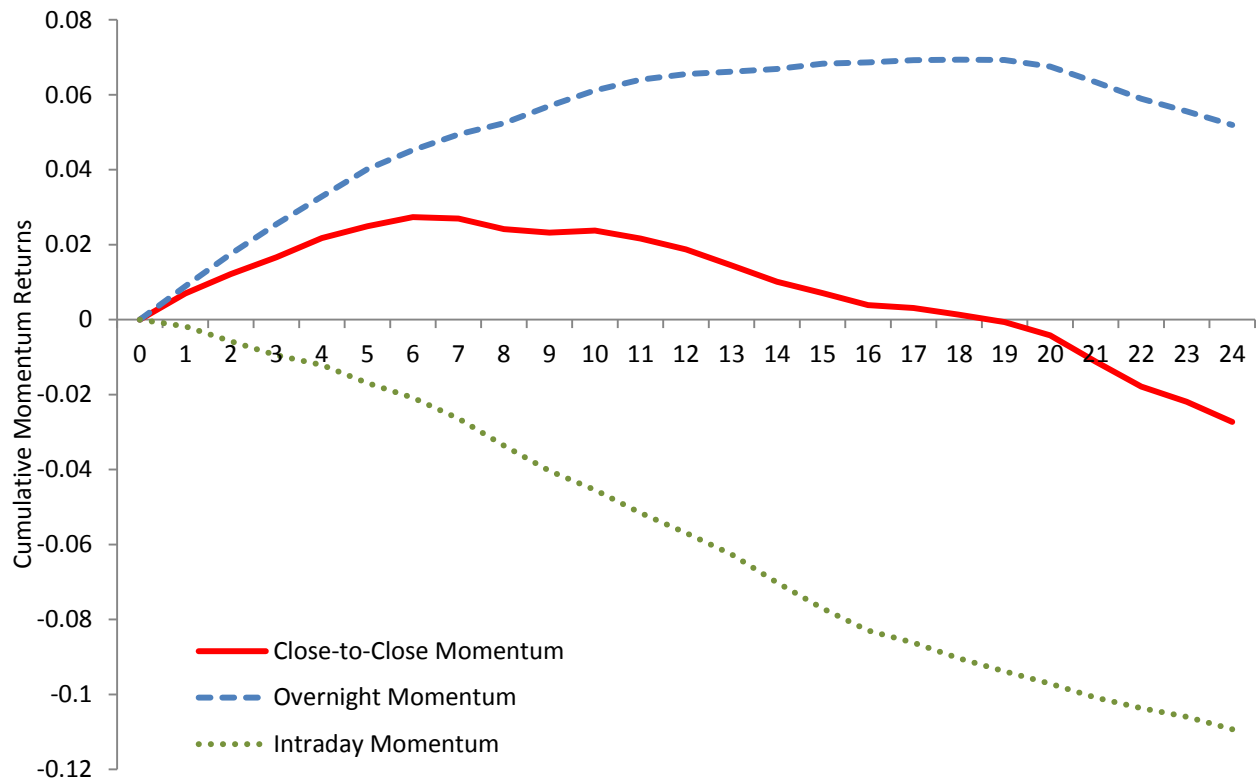


Figure A2: This figure plots cumulative returns to the momentum strategy during the day vs. at night in the 24 months following portfolio formation. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The red solid curve (respectively blue dashed curve / green dotted curve) shows the cumulative close-to-close (respectively overnight / intraday) momentum returns in the 24 months following portfolio formation.

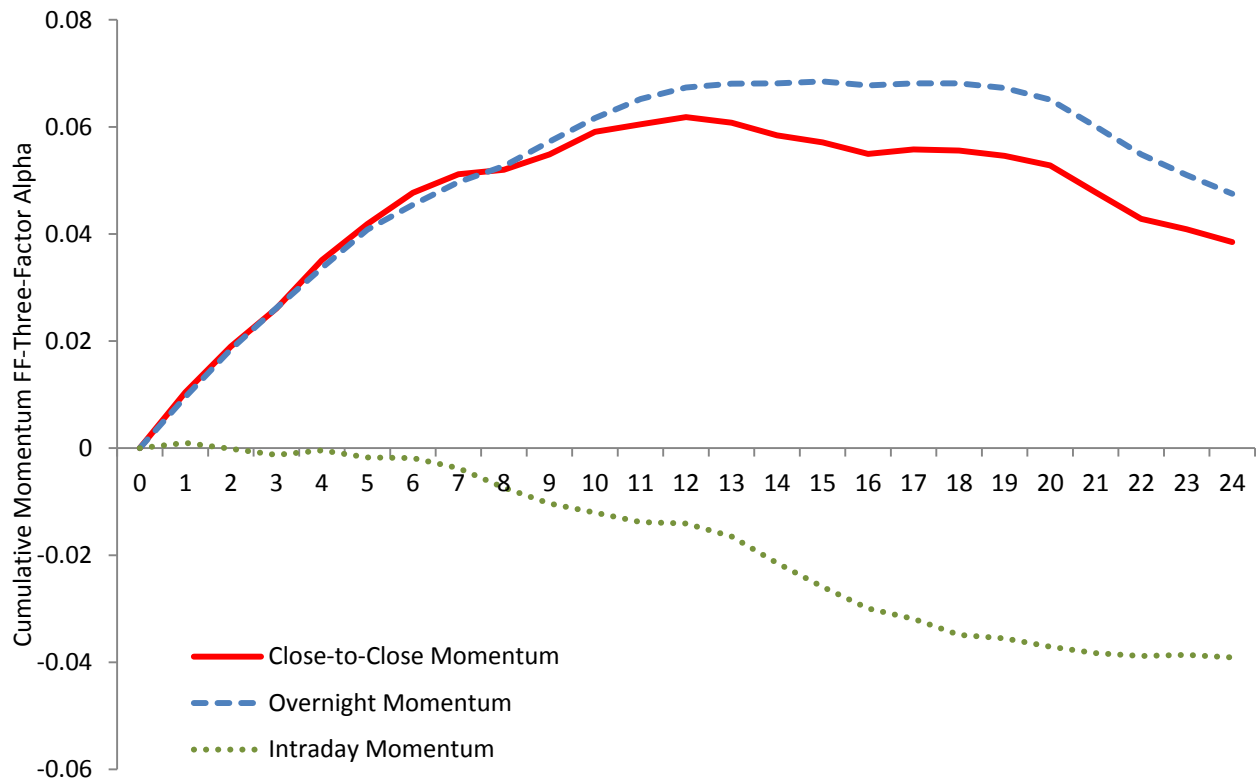


Figure A3: This figure shows cumulative Fama-French three-factor alpha to the momentum strategy during the day vs. at night in the 24 months following portfolio formation. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The red solid (respectively blue dashed / green dotted) curve shows the cumulative close-to-close (respectively overnight / intraday) momentum returns in the 24 months following portfolio formation.

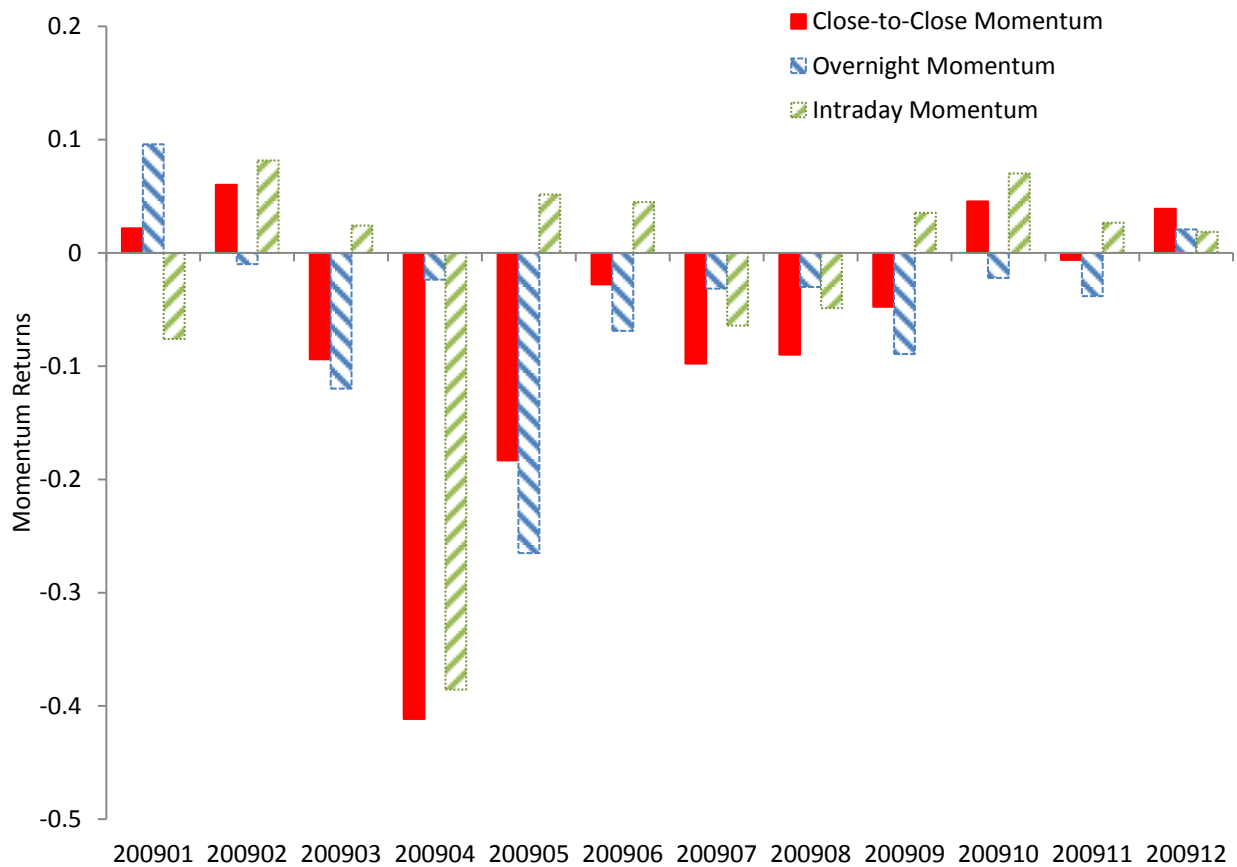


Figure A4: This figure shows monthly returns to the momentum strategy during the day vs. at night in the year 2009. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The red solid bars show the value-weight close-to-close momentum return in each month of 2009. The blue shaded bars show the value-weight overnight momentum return in each month, and the green shaded bars show the value-weight intraday momentum return in each month.

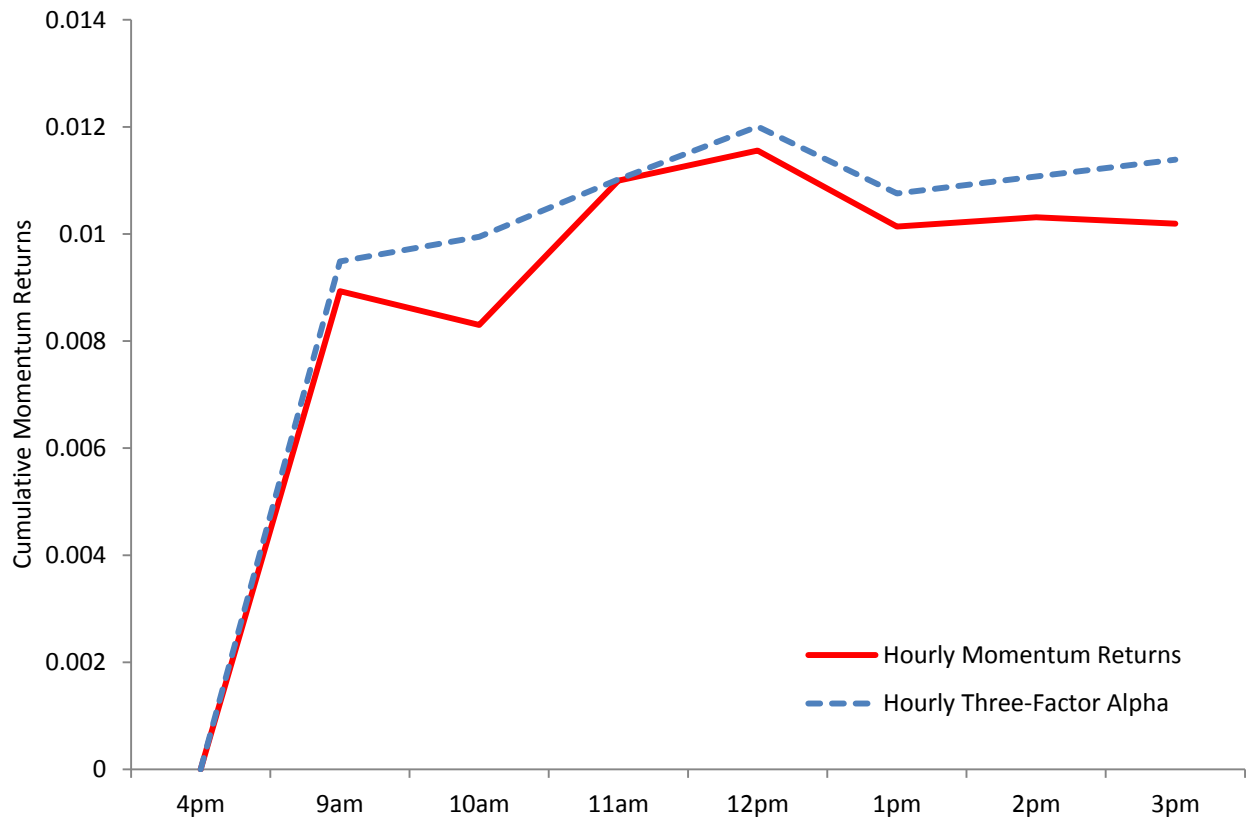


Figure A5: This figure shows the cumulative hourly (abnormal) returns to the momentum strategy from the previous close to the next close, aggregated to the monthly level. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). We then go long the value-weight winner decile and short the value-weight loser decile. Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The red solid curve shows the cumulative hourly returns to the momentum strategy. The blue dashed curve shows the cumulative Fama-French three-factor alpha to the momentum strategy.

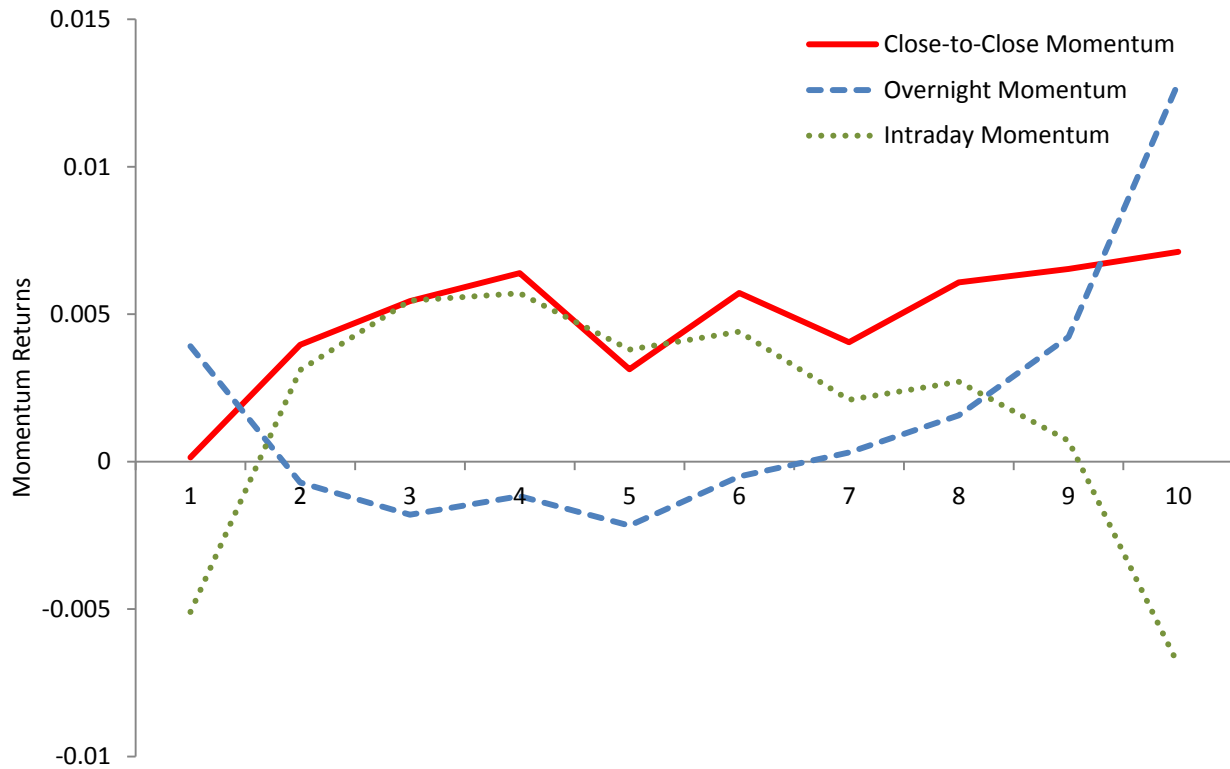


Figure A6: This figure shows value-weight portfolio returns of the ten momentum deciles during the day vs. at night. At the end of each month, all stocks are sorted into deciles based on their lagged 12-month cumulative returns (skipping the most recent month). Stocks with prices below \$5 a share and/or that are in the bottom NYSE size quintile are excluded from the sample. The red solid curve shows the value-weight close-to-close returns of the ten momentum deciles in the following month. The blue dashed curve shows the value-weight overnight returns of the ten momentum deciles in the following month. The green dotted curve shows the value-weight intraday returns of the ten momentum deciles in the following month. Appendix Table A4 Panel C documents that the U-shaped overnight momentum pattern of this graph becomes much more monotonic once we exclude the 20% of stocks with high idiosyncratic volatility.