Internet Appendix Tables

Table IA.1 Raw Returns: The Short Run Performance of Direct versus Indirect Trades

This table estimates the short run (one-month-ahead) relative trading profitability of large purchases versus large sales (*LP – LS*), for every category of direct or indirect insider trades (k), in the month following the trades. We regress the one-month-ahead *raw* stock return on the scaled rank of insider trade size for each category of insider trades, along with other control variables, as follows:

$$R_{j,t+1} = \alpha_t + \sum_{k=1}^{15} \beta_k \, \text{TRSIZE\_}k\text{\_RK}_{i,j,t} + \text{Controls}_{j,t} + \varepsilon_{i,j,t};$$

where *k* indexes the fifteen categories of direct and indirect trades by insider (*i*) analyzed here. The control variables are listed in Table 1. The dependent variable, $R_{j,t+1}$, is the leading one-month-ahead raw return for the firm (*j*). We multiply $R_{j,t+1}$ by 100 to reflect performance in percentage terms. TRSIZE_*k*_RK is the scaled tercile rank of trade size for each category of trades analyzed here (*k* = 1 - 15). For each category of direct or indirect trades (*k*), the coefficient of the scaled rank of trade size (β_k) is analogous to the return on a hedge portfolio that is long the tercile of large purchases of type *k* and short the tercile of large sales (*LP – LS*). To see this result, consider the association between the scaled rank of each trade size measure and future returns implied by equation (6): $\frac{\partial R(j,t+1)}{\partial \text{TRSIZE\_}k\text{\_RK}(j,t)} = \beta_k$. This partial derivative shows that a one-unit increase in the adjusted scaled rank of trade size, from the tercile of large sales to the tercile of large purchases (i.e., changing TRSIZE_*k*_RK from 0 to +1), is associated with a change in $R_{j,t+1}$ of β_k percent. Monthly fixed effects are included, and standard errors are clustered by time at the monthly level. The *t*-statistics are provided in parentheses below the parameter estimates. At the bottom of each column, we provide F-statistics that test the equality of different pairs of regression coefficients. Throughout the table, * indicates significance at the 0.10 level; ** at the 0.05 level; and *** at the 0.01 level.

Table IA.1, continued

Trade Category Variables		1	2	3	4	5	6	7	8	9
TRSIZE_ME_RK (All Direct Trades)	β_1	0.322*** (2.91)	0.303*** (2.79)	0.300*** (2.76)	0.324*** (2.92)	0.324*** (2.92)	0.322*** (2.93)	0.285*** (2.69)	0.285*** (2.68)	0.319*** (2.88)
TRSIZE_OTHER_RK (All Indirect Trades)	β_2	0.748*** (3.85)								
TRSIZE_FAM_RK	β_3		0.728*** (3.00)							0.718*** (2.97)
TRSIZE_SPOUSE_RK	β_4			0.542 (1.51)						
TRSIZE_CHILD_RK	β_5			0.923*** (2.62)						
TRSIZE_OTH-FAM_RK	β_6			0.048 (0.12)						
TRSIZE_TRUST_RK	β_7				0.939*** (3.90)					
TRSIZE_TRUST-FAM_RK	β_8					0.753** (2.55)				
TRSIZE_TRUST-NOTFAM_RK	β_9					1.056*** (3.71)	1.054*** (3.69)			1.018*** (3.59)
TRSIZE_TRUST-SPOUSE_RK	β_{10}						1.311** (2.27)			
TRSIZE_TRUST-CHILD_RK	β_{11}						0.885* (1.73)			
TRSIZE_RETIREMENT_RK	β_{12}							0.864* (1.74)		
TRSIZE_RET-FAM_RK	β_{13}								0.188 (0.14)	
TRSIZE_RET-NOTFAM_RK	β_{14}								1.083** (1.98)	0.924* (1.69)
TRSIZE_FOUND_RK	β_{15}									-0.932 (-1.53)

Table IA.1, continued

Control Variables		1	2	3	4	5	6	7	8	9
B/M	β_{16}	19.225	19.304	19.333	19.314	19.342	19.323	19.520	19.506	19.206
		(1.47)	(1.48)	(1.48)	(1.48)	(1.48)	(1.48)	(1.49)	(1.49)	(1.47)
SIZE	β_{17}	-8.951	-9.110	-9.135	-9.099	-9.097	-9.132	-9.153	-9.141	-8.946
		(-1.45)	(-1.48)	(-1.48)	(-1.48)	(-1.48)	(-1.48)	(-1.48)	(-1.48)	(-1.45)
$RET_{j,t}$	β_{18}	-0.547	-0.557	-0.559	-0.553	-0.553	-0.555	-0.565	-0.564	-0.546
		(-0.54)	(-0.55)	(-0.55)	(-0.54)	(-0.54)	(-0.54)	(-0.55)	(-0.55)	(-0.53)
$RET_{j,t-6,t-1}$	β_{19}	0.053	0.036	0.035	0.037	0.037	0.036	0.024	0.025	0.046
		(0.13)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.06)	(0.06)	(0.11)
PROFIT	β_{20}	0.381	0.369	0.370	0.373	0.373	0.375	0.363	0.363	0.380
		(1.23)	(1.19)	(1.19)	(1.20)	(1.20)	(1.21)	(1.17)	(1.17)	(1.22)
ASSETGR	β_{21}	-0.336**	-0.339**	-0.340**	-0.340**	-0.340**	-0.342**	-0.345**	-0.345**	-0.339**
		(-2.13)	(-2.14)	(-2.15)	(-2.15)	(-2.15)	(-2.16)	(-2.18)	(-2.18)	(-2.14)
STDRET	β_{22}	5.010	5.218	5.227	5.020	5.017	5.006	5.336	5.341	5.003
		(0.30)	(0.31)	(0.31)	(0.30)	(0.30)	(0.30)	(0.32)	(0.32)	(0.30)
N		326,358	326,358	326,358	326,358	326,358	326,358	326,358	326,358	326,358
Adj. R^2		0.154	0.154	0.154	0.154	0.154	0.154	0.154	0.154	0.154
H_i: Testing equality		$\beta_1 = \beta_2$	$\beta_1 = \beta_3$	$\beta_1 = \beta_5$	$\beta_1 = \beta_7$	$\beta_1 = \beta_8$	$\beta_1 = \beta_9$	$\beta_1 = \beta_{12}$	$\beta_1 = \beta_{13}$	$\beta_1 = \beta_3$
F-Statistic		6.6	3.9	3.2	9.0	2.5	8.2	1.4	0.0	3.4
(p-value)		(.01)**	(.05)**	(.07)*	(.00)***	(.12)	(.00)***	(.24)	(.94)	(.07)*
						$\beta_1 = \beta_9$	$\beta_1 = \beta_{10}$		$\beta_1 = \beta_{14}$	$\beta_1 = \beta_9$
						8.3(.00)***	2.9(.09)*		2.1(.14)	7.5(.01)***
							$\beta_1 = \beta_{11}$			$\beta_1 = \beta_{14}$
							1.3(.26)			1.2(.27)
										$\beta_1 = \beta_{15}$
										4.4(.04)**

Table IA.2 Raw Returns: The Long Run Performance of Direct versus Indirect Trades

This table presents the long run relative trading performance of direct versus indirect trades over different periods that extend from month *t+1* through month *t+a*. In this table, we analyze whether the short run performance extends beyond one month, by considering returns over different time frames that span the two years following insider trades. For this analysis, we estimate a revised version of equation (1) that replaces $AR_{j,t+1}$ as the dependent variable with $CR_{j,t+1,t+a}$, as follows:

$$CR_{j,t+1,t+a} = \alpha + \beta_1 TRSIZE\_ME\_RK_{i,j,t} + \beta_2 TRSIZE\_FAM\_RK_{i,j,t} + \beta_3 TRSIZE\_TRUST\text{-}NOTFAM\_RK_{i,j,t} + \beta_4 TRSIZE\_RET\text{-}NOTFAM\_RK_{i,j,t} + \beta_5 TRSIZE\_FOUND\_RK_{i,j,t} + Controls_{j,t} + \varepsilon_{i,j,t}.$$

The first column shows the results for one-month-ahead *raw* returns ($R_{j,t+1}$) that are similar to our main model in column 9 of Table 4. The remaining columns present the analogous results for performance measured using *raw* returns over longer time frames extending 24 months into the future. We include the same controls as our analysis of equation (1) in Table 4. The coefficients of the controls have similar implications to those presented in Table 4, and are omitted here for brevity. All variables are defined in Table 1. Monthly fixed effects are included, and standard errors are clustered by time at the monthly level. The *t*-statistics are provided in parentheses below the parameter estimates. At the bottom of each column, we provide F-statistics that test the equality of different pairs of parameter estimates. Throughout this table, * indicates significance at the 0.10 level; ** at the 0.05 level; and *** at the 0.01 level.

Variables		1 $R_{i,j,t+1}$	2 $CR_{j,t+1,t+6}$	3 $CR_{j,t+1,t+12}$	4 $CR_{j,t+1,t+24}$
TRSIZE_ME_RK	β_1	0.319***	1.069***	1.719***	2.576***
		(2.88)	(3.93)	(4.08)	(3.48)
TRSIZE_FAM_RK	β_2	0.718***	3.037***	3.623***	6.335***
		(2.97)	(3.54)	(3.39)	(3.94)
TRSIZE_TRUST-NOTFAM_RK	β_3	1.018***	2.018***	4.466***	11.069***
		(3.59)	(2.66)	(4.12)	(6.29)
TRSIZE_RET_NOTFAM_RK	β_4	0.924*	-0.068	1.227	0.287
		(1.69)	(-0.04)	(0.53)	(0.09)
TRSIZE_FOUND_RK	β_5	-0.932	-1.949	-2.652	-1.500
		(-1.53)	(-0.91)	(-0.78)	(-0.29)
Controls		Yes	Yes	Yes	Yes
N		326,358	321,929	304,057	266,699
Adj. R^2		0.154	0.148	0.132	0.178
H_i: Testing equality; F-Stat (p-value)					
1. $\beta_1 = \beta_2$		3.4(.07)*	6.6(.01)**	3.7(.06)*	6.2(.01)**
2. $\beta_1 = \beta_3$		7.5(.01)***	1.9(.17)	7.5(.00)***	25.1(.00)***
3. $\beta_1 = \beta_4$		1.2(.27)	0.5(.50)	0.0(.84)	0.4(.50)
4. $\beta_1 = \beta_5$		4.4(.04)**	2.0(.16)	1.7(.20)	0.7(.42)

Table IA.3. Direct versus Indirect Trades and Large Idiosyncratic Stock Price Changes: Linear Probability Models

In an OLS regression framework, this table repeats the analysis in Panel B of Table 7 that relates direct and indirect trades to the likelihood of an imminent large idiosyncratic stock price change within the next 10 days following an insider trade:

$$(+/-\Delta P_{j,t}) = \alpha_t + \beta_1 \text{TRSIZE\_ME\_RK}_{i,j,t} + \beta_2 \text{TRSIZE\_OTHER\_RK}_{i,j,t}$$
$$(\text{or } \beta_3 \text{TRSIZE\_FAM\_RK}_{i,j,t} + \beta_4 \text{TRSIZE\_TRUST-NOTFAM\_RK}_{i,j,t}$$
$$+ \beta_5 \text{TRSIZE\_RET\_NOTFAM\_RK}_{i,j,t} + \beta_6 \text{TRSIZE\_FOUND\_RK}_{i,j,t})$$
$$+ \text{Controls}_{j,t} + \varepsilon_{i,j,t}.$$

$+\Delta P$ ($-\Delta P$) is an indictor variable for a large (negative) positive price change within 10 days following an insider trade. The sample of large price change events is identified as follows. First, for each firm we compute the three-day cumulative abnormal return (CAR) around every trading day during a given year. If the CAR for a given day is among the top (bottom) 5% among all trading days in the year, that day is identified as having a large positive (negative) price change. If such a large price increase (decrease) occurs within 10 days following an insider trade, the dummy variable $+\Delta P$ ($-\Delta P$) is assigned a value of one, and zero otherwise.

We include the same control variables as our analysis of equation (1) in Table 4. Monthly fixed effects are included, and standard errors are clustered by time at the monthly level. The *t*-statistics are provided in parentheses below the parameter estimates. At the bottom of each column, we provide F-statistics that test the equality of different pairs of parameter estimates. Throughout this table, * indicates significance at the 0.10 level; ** at the 0.05 level; and *** at the 0.01 level.

Table IA.3, continued

Variables		1 +Δ*P*	2 +Δ*P*	3 +Δ*P*	4 +Δ*P*	5 -Δ*P*	6 -Δ*P*	7 -Δ*P*	8 -ΔP
TRSIZE_ME_RK (All Direct Trades)	β_1	0.077*** (18.66)	0.039*** (11.62)	0.076*** (18.41)	0.038*** (11.42)	-0.013*** (-3.88)	-0.022*** (-6.43)	-0.012*** (-3.76)	-0.021*** (-6.34)
TRSIZE_OTHER_RK (All Indirect Trades)	β_2	0.109*** (16.29)	0.074*** (11.89)			-0.038*** (-6.21)	-0.040*** (-6.93)		
TRSIZE_FAM_RK	β_3			0.098*** (10.28)	0.067*** (7.39)			-0.030*** (-3.31)	-0.030*** (-3.39)
TRSIZE_TRUST-NOTFAM_RK	β_4			0.107*** (10.68)	0.066*** (6.63)			-0.027*** (-3.41)	-0.039*** (-5.01)
TRSIZE_RET_NOTFAM_RK	β_5			0.074*** (4.26)	0.040** (2.29)			-0.021 (-1.19)	-0.020 (-1.14)
TRSIZE_FOUND_RK	β_6			0.053* (1.84)	0.038 (1.33)			0.023 (0.76)	0.009 (0.31)
Controls		No	Yes	No	Yes	No	Yes	No	Yes
N		323,832	323,832	323,832	323,832	323,832	323,832	323,832	323,832
Pseudo R^2		0.038	0.069	0.037	0.069	0.036	0.048	0.035	0.048
Hi: Testing Equality, F-Stat (p-value)									
1. $\beta_1 = \beta_2$		31.1(.00)***	39.3(.00)***	-	-	19.0(.00)***	10.0(.00)***	-	-
2. $\beta_1 = \beta_3$		-	-	5.9(.02)**	10.8(.00)***	-	-	3.9(.05)**	1.0(.31)
3. $\beta_1 = \beta_4$		-	-	10.0(.00)***	8.4(.00)***	-	-	3.7(.07)*	4.9(.03)**
4. $\beta_1 = \beta_5$		-	-	0.2(.66)	0.0(.93)	-	-	0.2(.63)	0.0(.96)
5. $\beta_1 = \beta_6$		-	-	0.73(.42)	0.0(.99)	-	-	1.4(.24)	1.1(.30)

Table IA.4. The Attributes of Insiders and Their Firms, for Subsets of Insiders Who Make Direct Trades versus Indirect Trades: Linear Probability Models

This table relates the personal attributes of insiders and their respective firms to the likelihood of making direct trades versus indirect trades in an OLS regression framework. The dependent variable is an indicator variable that takes a value of one if a trade is an indirect trade. IO is the percentage institutional ownership in the insider's firm. The other firm attributes are described in Table 1. The remaining variables pertain to the attributes of the insiders themselves, as follows. AGE is the insider's age. YEAR_ EXP is the number of years of experience since the insider's first year of insider trading. TIMEROLE is the number of years since the insider's first year in the current position. CEOCB is an indicator variable that takes a value of one if the insider is the CEO or Chair of the Board. GCOUNSEL is a dummy variable that takes a value of one if the insider is the general counsel. FEMALE is a dummy variable for female insiders. COMPEN is the total compensation of the insider, and DELTA is a measure of pay-performance sensitivity following Coles et al (2006). TOTSHR is the total number of shares traded by the insider in month *t*, scaled by the total trading volume by all investors. N_MTH_VOL is constructed as the number of trades made by the insider during month *t*, scaled by the total trading (share) volume across all investors in the same month. We take the natural log of N_MTH_VOL. TRADENO is the total number of trading months for the insider during the past three years. NONROUTINE_CMP is an indicator variable for non-routine (or opportunistic) insiders, following Cohen et al. (2012). OPPORT_AH is an indicator variable that identifies opportunistic insiders, based on Ali and Hirshleifer (2017). SHORT HORIZON is a rank variable that takes a value of one, two, or three for insiders with a long, medium, or short investment horizon, respectively, following Akbas et al. (2020). The sample period covers July 2003 through December 2017. Monthly fixed effects are included, and standard errors are clustered by time at the monthly level. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Table IA.4, continued

Variables	1	2	3	4	5	6	7	8	9	10	11	12
B/M	0.030	-0.119	-0.141	-0.138	0.073	0.060	0.032	1.060***	0.016	1.620***	0.450***	1.596***
	(0.24)	(-0.96)	(-1.03)	(-1.00)	(0.59)	(0.43)	(0.23)	(6.30)	(0.15)	(7.71)	(3.67)	(8.83)
SIZE	-1.515***	-1.061***	-1.038***	-1.108***	-1.461***	-1.052***	-1.098***	-1.272***	-0.061	-0.853***	-1.542***	-0.889***
	(-23.50)	(-16.61)	(-14.41)	(-15.48)	(-22.37)	(-14.69)	(-15.58)	(-10.44)	(-0.82)	(-8.46)	(-24.94)	(-12.96)
$RET_{j,t}$	-0.025***	-0.028***	-0.020**	-0.023**	-0.024***	-0.019**	-0.019**	-0.021*	-0.041***	-0.006	-0.023***	-0.027**
	(-3.09)	(-3.59)	(-2.15)	(-2.52)	(-2.90)	(-2.07)	(-2.06)	(-1.68)	(-5.86)	(-0.35)	(-2.81)	(-2.39)
$RET_{j,t-6,t-1}$	-0.007*	-0.009**	0.000	-0.002	-0.007*	-0.001	-0.001	0.019***	-0.008**	-0.005	-0.005	-0.009**
	(-1.79)	(-2.22)	(0.00)	(-0.44)	(-1.73)	(-0.35)	(-0.18)	(3.45)	(-2.19)	(-0.79)	(-1.35)	(-2.15)
PROFIT	-0.030***	-0.024***	-0.017***	-0.023***	-0.029***	-0.018***	-0.018***	-0.009*	-0.033***	-0.019***	-0.033***	0.001
	(-6.95)	(-5.87)	(-3.62)	(-4.86)	(-6.87)	(-3.85)	(-3.92)	(-1.76)	(-10.00)	(-2.81)	(-7.80)	(0.12)
ASSETGR	0.006***	0.009***	0.015***	0.018***	0.006**	0.015***	0.013***	-0.005	0.006***	-0.006	0.002	0.002
	(2.65)	(3.77)	(4.91)	(6.07)	(2.42)	(4.75)	(4.43)	(-1.41)	(2.73)	(-1.28)	(0.87)	(0.56)
STDRET	0.513***	0.430***	0.539***	0.659***	0.509***	0.472***	0.476***	0.891***	0.832***	0.526***	0.554***	0.679***
	(5.64)	(5.18)	(5.38)	(6.22)	(5.63)	(4.90)	(4.94)	(7.68)	(7.66)	(3.89)	(6.09)	(6.11)
		IO	AGE	YEAR_EXP	CEOCB	GCOUNSEL	FEMALE	COMPEN	TOTSHR	TRADENO	TRADENO	TRADENO
		-0.079***	0.002***	0.004***	0.037***	-0.080***	-0.012***	-0.019***	1.370***	0.007***	0.004***	0.005***
		(-24.74)	(13.35)	(19.95)	(16.54)	(-20.18)	(-3.27)	(-10.20)	(14.80)	(19.89)	(20.66)	(21.47)
				TIMEROLE				DELTA	N_MTH_VOL	NONROUTINE CMP	OPPORTAH	SHORTHORIZON
				0.001***				0.044***	0.006***	0.015***	0.021***	0.020***
				(3.99)				(28.93)	(8.65)	(4.28)	(8.29)	(10.07)
N	323,818	323,804	157,342	159,417	323,818	159,417	157,475	63,744	323,799	76,847	323,818	135,042
Adj. R^2	0.014	0.017	0.009	0.012	0.015	0.008	0.006	0.042	0.046	0.032	0.019	0.020

Table IA.5. Relative Performance of Direct versus Indirect Trades: Excluding Opportunistic Insiders

In this table, we replicate the main results in Table 4 after excluding opportunistic insiders identified in the prior literature. Specifically, in columns (1) and (2) we exclude non-routine insiders (Cohen, Malloy, and Pomorski, CMP, 2012), in columns (3) and (4) we omit insiders who make profitable trades ahead of earnings announcements (Ali and Hirshleifer, AH, 2017), and in columns (5) and (6) we exclude insiders with a short investment horizon (Akbas, Jiang, and Koch, AJK, 2020). In the last two columns, we exclude all three types of opportunistic insiders together. As in Table 4, for each category of direct or indirect trades (*k*), the coefficient of the scaled rank of trade size (β_k) is analogous to the return on a hedge portfolio that is long the tercile of large purchases of type *k* and short the tercile of large sales (*LP – LS*). Monthly fixed effects are included, and standard errors are clustered by time at the monthly level. The *t*-statistics are provided in parentheses below the parameter estimates. At the bottom of each column, we provide F-statistics that test the equality of different pairs of regression coefficients. Throughout the table, * indicates significance at the 0.10 level; ** at the 0.05 level; and *** at the 0.01 level.

Excluding Opportunistic Insiders Identified in:		1	2	3	4	5	6	7	8
		CMP(2012)		AH (2017)		AJK (2020)		All Three	
TRSIZE_ME_RK	β_1	0.455***	0.450***	0.398***	0.396***	0.395***	0.397***	0.458***	0.456***
(All Direct Trades)		(4.26)	(4.20)	(3.79)	(3.78)	(3.77)	(3.78)	(4.14)	(4.11)
TRSIZE_OTHER_RK	β_2	0.978***		0.849***		0.830***		0.923***	
(All Indirect Trades)		(4.69)		(4.28)		(4.11)		(4.05)	
TRSIZE_FAM_RK	β_3		1.011***		0.837***		0.890***		1.018***
			(3.64)		(3.13)		(3.66)		(3.38)
TRSIZE_TRUST-NOTFAM_RK	β_4		1.165***		1.157***		1.139***		1.054***
			(3.58)		(4.05)		(3.90)		(3.08)
TRSIZE_RET_NOTFAM_RK	β_5		1.343**		0.995*		0.622		1.014*
			(2.43)		(1.80)		(1.06)		(1.67)
TRSIZE_FOUND_RK	β_6		-0.401		-0.621		-0.469		-0.171
			(-0.55)		(-0.93)		(-0.73)		(-0.20)
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		278,132	278,132	300,785	300,785	298,317	298,317	241,155	241,155
Adj. R^2		0.012	0.012	0.011	0.011	0.011	0.011	0.012	0.012
H_i: Testing equality; F-Stat (p-value)									
1. $\beta_1 = \beta_2$		6.9(.01)***		6.0(.02)**		4.9(.03)**		4.2(.04)**	
2. $\beta_1 = \beta_3$			4.5(.04)**		2.9(.09)*		4.2(.04)**		3.5(.06)*
3. $\beta_1 = \beta_4$			5.1(.02)**		7.6(.01)***		7.0(.01)***		3.1(.08)*
4. $\beta_1 = \beta_5$			2.5(.12)		1.1(.29)		0.1(.71)		0.8(.37)
5. $\beta_1 = \beta_6$			1.4(.24)		2.4(.12)		1.9(.17)		0.5(.47)