

**Online Supplementary For “Test for Zero Skill in
Stock Picking or Market Timing”**

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Supplementary Material

S1 Correlated And Heteroscedastic Errors

This section generalizes the developed test for at least one zero skill to correlated and heteroscedastic errors. Specifically, we model $\{\varepsilon_t\}$ by the following AR-GARCH model

$$\varepsilon_t = \sum_{i=1}^s \phi_i \varepsilon_{t-i} + U_t, \quad U_t = \eta_t \sigma_t, \quad \sigma_t^2 = w + \sum_{i=1}^p a_i U_{t-i}^2 + \sum_{j=1}^q b_j \sigma_{t-j}^2. \quad (\text{S1})$$

Define $\tilde{m} = [(n-p)/2]$ and $\tilde{M} = 2\tilde{m}$. The modified weight functions in our weighted least squares procedure are

$$\left\{ \begin{array}{l} \tilde{w}_{t,1} = \min_{0 \leq i \leq p} w_{t+p-i,1} \text{ for } t = 1, \dots, n-p, \\ \tilde{w}_{t,2}^{-1} = 1 + \max_{0 \leq i \leq p} \{ |Y_{t+p-i}|, \|\mathbf{X}_{t+p-i}\|, \|\mathbf{X}_{t+\tilde{m}+p-i}\|, H(X_{t+p-i,1}), \\ \quad H(X_{t+\tilde{m}+p-i,1}), H(X_{t+p-i,1})H(X_{t+\tilde{m}+p-i,1}) \} \text{ for } t = 1, \dots, \tilde{m}, \end{array} \right. \quad (\text{S2})$$

where $w_{t,1}$ is defined in (2.6) of the main paper. Put $\boldsymbol{\zeta} = (\alpha, \boldsymbol{\beta}^T, \gamma, \phi_1, \dots, \phi_s)^T$.

Then, we can estimate $\boldsymbol{\zeta}$ by minimizing the following,

$$\begin{aligned} & \sum_{t=1}^{n-p} \{ Y_{t+p} - \alpha - \boldsymbol{\beta}^T \mathbf{X}_{t+p} - \gamma H(X_{t+p,1}) \\ & \quad - \sum_{i=1}^p \phi_i (Y_{t+p-i} - \alpha - \boldsymbol{\beta}^T \mathbf{X}_{t+p-i} - \gamma H(X_{t+p-i,1})) \}^2 \tilde{w}_{t,1}. \end{aligned}$$

Denote the resulting estimator by

$$\tilde{\boldsymbol{\zeta}} = (\tilde{\alpha}_{WLSE}, \tilde{\boldsymbol{\beta}}_{WLSE}^T, \tilde{\gamma}_{WLSE}, \tilde{\phi}_{1,WLSE}, \dots, \tilde{\phi}_{s,WLSE})^T$$

and define, for $t = 1, \dots, \tilde{M}$,

$$\begin{aligned}\tilde{Z}_{t,WLSE} &= Y_{t+p} - \tilde{\boldsymbol{\beta}}_{WLSE}^\tau \mathbf{X}_{t+p} - \sum_{i=1}^p \tilde{\phi}_{i,WLSE} (Y_{t+p-i} \\ &\quad - \tilde{\alpha}_{WLSE} - \tilde{\boldsymbol{\beta}}_{WLSE}^\tau \mathbf{X}_{t+p-i} - \tilde{\gamma}_{WLSE} H(X_{t+p-i,1})).\end{aligned}$$

Thus, the new estimator for θ is

$$\begin{aligned}& (\tilde{\alpha}_{1,w}, \tilde{\theta}_w, \tilde{\gamma}_{1,w})^\tau \\ &= \arg \min_{\alpha_1, \theta, \gamma_1} \sum_{t=1}^{\tilde{m}} \{ \tilde{Z}_{t,WLSE} \tilde{Z}_{t+\tilde{m},WLSE} \\ &\quad - (\tilde{\alpha}_{WLSE} + \tilde{\gamma}_{WLSE} H(X_{t+p,1})) \tilde{Z}_{t+\tilde{m},WLSE} \\ &\quad - (\tilde{\alpha}_{WLSE} + \tilde{\gamma}_{WLSE} H(X_{t+p+\tilde{m},1})) \tilde{Z}_{t,WLSE} + \alpha_1 \\ &\quad + \theta (H(X_{t+p,1}) + H(X_{t+p+\tilde{m},1})) \\ &\quad + \gamma_1 H(X_{t+p,1}) H(X_{t+p+\tilde{m},1}) \}^2 \tilde{w}_{t,2}.\end{aligned}$$

Theorem S1. *Suppose models (2.1), (2.4), and (S1) hold with conditions C1)–C4). Then, as $n \rightarrow \infty$, $\sqrt{n}(\tilde{\theta}_w - \theta) \xrightarrow{d} N(0, \sigma_1^2)$, where σ_1^2 is a positive constant with a complicated formula.*

As before, we estimate the asymptotic variance of $\tilde{\theta}_w$ by the weighted bootstrap method described below. Although the proposed estimation employs the auto-regressive structure following Liu et al. [2010] and Xiao et al. [2003], it does not estimate the GARCH model. Hence, the proposed inference is robust against heteroscedasticity, and a standard residual-based bootstrap method does not apply for quantifying the estimation uncertainty.

- Step Bi) Draw a random sample of size n from the standard exponential

distribution. Denote these random draws by ξ_1^b, \dots, ξ_n^b .

- Step Bii) Compute

$$\begin{aligned} \tilde{\zeta}^b = & \arg \min_{\zeta} \sum_{t=1}^{n-p} \xi_{t+p}^b \{Y_{t+p} - \alpha - \beta^\tau \mathbf{X}_{t+p} - \gamma H(X_{t+p,1}) \\ & - \sum_{i=1}^p \phi_i (Y_{t+p-i} - \alpha - \beta^\tau \mathbf{X}_{t+p-i} - \gamma H(X_{t+p-i,1}))\}^2 \tilde{w}_{t,1}. \end{aligned}$$

- Step Biii) Write

$$\tilde{\zeta}^b = (\tilde{\alpha}^b, \tilde{\beta}^{b\tau}, \tilde{\gamma}^b, \tilde{\phi}_1^b, \dots, \tilde{\phi}_s^b)^\tau.$$

Then, define for $t = 1, \dots, \tilde{M}$

$$\begin{aligned} \tilde{Z}_{t,WLSE}^b = & Y_{t+p} - \tilde{\beta}_{WLSE}^{b\tau} \mathbf{X}_{t+p} - \sum_{i=1}^p \tilde{\phi}_i^b (Y_{t+p-i} - \tilde{\alpha}^b - \tilde{\beta}^{b\tau} \mathbf{X}_{t+p-i} \\ & - \tilde{\gamma}^b H(X_{t+p-i,1})), \end{aligned}$$

and calculate

$$\begin{aligned} & (\hat{\alpha}_{1,w}^b, \hat{\theta}_w^b, \hat{\gamma}_{1,w}^b)^\tau \\ = & \arg \min_{\alpha_1, \theta, \gamma_1} \sum_{t=1}^{\tilde{m}} \xi_{t+\tilde{m}+p}^b \{ \hat{Z}_{t,WLSE}^b \hat{Z}_{t+\tilde{m},WLSE}^b \\ & - (\hat{\alpha}_{WLSE}^b + \hat{\gamma}_{WLSE}^b H(X_{t+p,1})) \hat{Z}_{t+\tilde{m}+p,WLSE}^b \\ & - (\hat{\alpha}_{WLSE}^b + \hat{\gamma}_{WLSE}^b H(X_{t+\tilde{m}+p,1})) \hat{Z}_{t,WLSE}^b + \alpha_1 \\ & + \theta (H(X_{t+p,1}) + H(X_{t+\tilde{m}+p,1})) \\ & + \gamma_1 H(X_{t+p,1}) H(X_{t+\tilde{m}+p,1}) \}^2 \tilde{w}_{t,2}. \end{aligned}$$

- Step Biv) Repeat the above three steps B times to get $\{\tilde{\theta}_w^b\}_{b=1}^B$ and

estimate the asymptotic variance of $\tilde{\theta}_w$ by

$$\tilde{\sigma}_1^2 = \frac{n}{B} \sum_{b=1}^B (\tilde{\theta}_w^b - \tilde{\theta}_w)^2.$$

Theorem S2. *Under the conditions of Theorem S1, $\tilde{\sigma}_1^2/\sigma_1^2$ converges in probability to one as $B \rightarrow \infty$ and $n \rightarrow \infty$.*

Therefore, using Theorems S1 and S2, we reject the null hypothesis of (2.2) at level a if $\tilde{\theta}_w^2/\tilde{\sigma}_1^2 > \chi_{1,1-a}^2$. Because these two theorems can be proved in a way similar to Theorems 1 and 2, we skip the proofs. Alternatively, we can compute the pvalue for testing H_0 in (2.2) by $\frac{1}{B} \sum_{b=1}^B I(|\tilde{\theta}_w| < |\tilde{\theta}_w^b - \tilde{\theta}_w|)$, which leads to the asymptotically correct size by taking $B \rightarrow \infty$ and then $n \rightarrow \infty$.

S2 Plots of Each Group Over Time

Figure S1 plots the evolution of each skill group over time, measured as the number of funds in each group out of all actively managed funds every month. We observe that the percentage of funds with stock picking and market timing skills is remarkably stable over time; it is generally between 1% to 2% at any given point in time for the 468 months in our sample period. Funds with neither skill are also relatively stable over time. In sharp contrast, there are significant variations in the percentage of funds in the other skill groups over time. For funds with the only stock picking skill, their prevalence starts at around 1% of the time in 1980, peaks at over 5% of the time by the 2009 Financial Crisis, and then declines by the end of

our sample period in 2018. However, funds with the only market timing skill peak at over 5% of the time near the start of our sample in 1980, with local troughs and peaks in 1988 and 2001, respectively, and a secular decline after 2001. As a result, these patterns suggest that funds with only one skill and not the other are easier to create and are more subject to survivorship concerns. For example, funds with the pure market timing skill possibly have a more challenging time attracting or maintaining investor flows during good times, while pure stock picking skill might expose these funds to higher bankruptcy risk during market downturns. More interestingly, funds with both skills should not face these trade-offs as they survive consistently over time and are harder to create. Relatedly, funds with neither skill are easier to create but should also survive for a shorter time. Consistent with these survivorship conjectures, we find that funds on average exist for 233, 190, 145, 158, and 158 months for the “Both”, “Picking”, “Timing”, “Neither”, and “Zero-skill” groups, respectively.

S3 Comparison with the Zero Skill Group

Next, we directly compare each skill group’s active management, fund characteristics, and funds’ stock holdings relative to the zero skill group. Specifically, we run cross-sectional regressions each month of a given quantity of

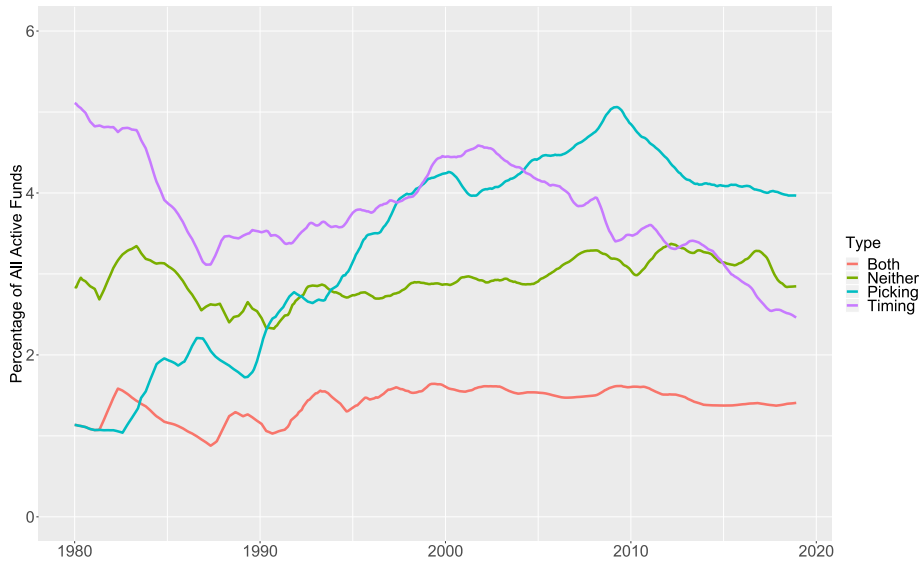


Figure S1: The Percentage of Skilled Funds over Time

This figure presents the time series of the percentage of funds in each mutually exclusive skill group out of the total number of active funds from 1980 to 2018. At the 10% level among funds rejecting $H_0 : \alpha = 0$ or $\gamma = 0$, the “Both” group comprises funds with positive picking ($\alpha > 0$) and timing ($\gamma > 0$) skills, the “Picking” group comprises funds with positive picking and negative timing skills, the “Timing” group comprises funds with positive timing and negative picking skills, and the “Neither” group comprises funds with negative picking and timing skills.

interest on dummy variables for each skill group, leaving out the zero skill group to represent the benchmark constant term in the regression. We save the coefficients (including the constant term) from this first-stage regression and then compute these first-stage coefficients' Fama and MacBeth [1973] time-series average. For inference, we report t -statistics based on Newey and West [1987] standard errors with 12 lags.

We first examine active management measures for each of the skill groups compared with that of the zero skill group in Table S1. For generating alpha, the mutual fund literature provides several measures that proxy for the extent of active management. Consistent with this notion that stock picking skill generates alpha, we find that higher active management based on the Table S1 proxies is related to the activities of the funds with both skills and, to an extent, the pure stock picking funds. Furthermore, we also find that the active management activities of the pure stock picking and pure market timing funds are in opposite directions relative to zero skill funds for the following measures of active management: R-squared (rsq), idiosyncratic volatility (idiovol), alpha (4f, 3f, 1f), active share (active_share), and hypothetical excess return (hypo_ret). More interestingly, funds with stock picking and market timing skills can favor either side of this trade-off. For example, these funds have lower R-squared and higher

idiosyncratic volatility related to their stock picking skill and have lower active share and active weight related to their market timing skill. Finally, funds with neither stock picking nor market timing skill actively manage similarly to zero skill funds across the board, except for a lower active share measure.

In Table S2, we then examine the fund characteristics of the funds in each skill group relative to that of the zero skill funds. We find pure stock picking and pure market timing funds have lower total net assets (*tna*) and belong to fund families with lower total net assets (*tna_family*), while the reverse is the case for funds with both skills. Stock picking funds in both groups tend to be around 3 to 5 years younger, while all three positive skill groups incur less turnover than zero skill funds do. Related to their lower turnover, we find that funds with both skills charge lower expense ratios than zero skill funds charge. Finally, we also puzzlingly observe that funds in neither group attract higher total net assets, incur more turnover, and charge higher fees, all to generate a very average risk-return profile.

Lastly, we examine the stock-holding characteristics in Table S3 for the skilled vs. zero skill groups, using the 94 stock holdings characteristics collected by Green et al. [2017] to describe the cross-section of expected returns for stocks. Focusing purely on the estimated coefficients, we again

Table S1: **Active Management**

This table compares the fund performance in each mutually exclusive skill group to the benchmark group. In each row, we report Fama and MacBeth [1973] times-series averages of the coefficients from cross-sectional regressions of the monthly fund performance measure on indicators for each skill group, except for the “Zero Skill” group. At the 10% level among funds rejecting $H_0 : \alpha = 0$ or $\gamma = 0$, the “Both” group comprises funds with positive picking ($\alpha > 0$) and timing ($\gamma > 0$) skills, the “Picking” group comprises funds with positive picking and negative timing skills, the “Timing” group comprises funds with positive timing and negative picking skills, and the “Neither” group comprises funds with negative picking and timing skills. The “Zero Skill” group comprises all other funds. All values are multiplied by 100 for ease of presentation. In parentheses below the coefficient estimates, we report t -statistics based on Newey and West [1987] standard errors with 12 lags. The sample period is from 1980 to 2018. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
rsq	88.282*** (140.368)	-4.743*** (-5.146)	-2.134*** (-3.207)	3.990*** (13.513)	-0.944 (-1.616)
idiovol	1.612*** (26.190)	0.109** (2.280)	0.248*** (5.210)	-0.348*** (-17.998)	0.023 (0.806)
alpha_4f	-0.036** (-2.002)	0.135*** (3.978)	0.022 (0.724)	-0.022 (-1.503)	-0.004 (-0.163)
alpha_3f	-0.016 (-0.781)	0.101*** (2.714)	0.033 (1.027)	-0.017 (-1.150)	0.013 (0.555)
alpha_1f	-0.003 (-0.097)	0.130** (2.398)	0.040 (1.119)	-0.047*** (-3.837)	0.037 (1.134)
retgap	-0.041** (-2.499)	-0.001 (-0.060)	0.024 (0.894)	0.013 (0.813)	0.018 (1.103)
active_share	84.163*** (136.712)	-2.863* (-1.745)	5.086*** (10.363)	-4.575*** (-8.227)	-1.742*** (-3.648)
active_weight	84.803*** (52.224)	-3.782** (-2.383)	-1.475 (-0.870)	-3.938*** (-4.858)	-0.026 (-0.024)
hypo_ret	78.898*** (3.284)	9.371 (1.327)	9.509* (1.771)	-7.849*** (-3.053)	4.811 (1.026)

Table S2: **Fund Characteristics**

This table compares the fund characteristics of each mutually exclusive skill group to the benchmark group. In each row, we report Fama and MacBeth [1973] times-series averages of the coefficients from cross-sectional regressions of the monthly fund characteristic measure on indicators for each skill group, except for the “Zero Skill” group. At the 10% level among funds rejecting $H_0 : \alpha = 0$ or $\gamma = 0$, the “Both” group comprises funds with positive picking ($\alpha > 0$) and timing ($\gamma > 0$) skills, the “Picking” group comprises funds with positive picking and negative timing skills, the “Timing” group comprises funds with positive timing and negative picking skills, and the “Neither” group comprises funds with negative picking and timing skills. The “Zero Skill” group comprises all other funds. In parentheses below the coefficient estimates, we report t -statistics based on Newey and West [1987] standard errors with 12 lags. The sample period is from 1980 to 2018. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
fund_tna	932.774*** (8.726)	460.075*** (5.817)	-92.621** (-2.017)	-497.844*** (-5.621)	385.267** (2.281)
fund_age	17.633*** (23.778)	-3.206*** (-3.490)	-5.442*** (-9.363)	0.030 (0.081)	-0.108 (-0.377)
tna_family	102092.443*** (6.031)	45274.177*** (9.254)	-2178.513 (-1.115)	-55899.080*** (-5.809)	-13373.342*** (-4.269)
turn_ratio	77.825*** (32.054)	-27.705*** (-11.948)	-6.508*** (-3.201)	-4.368* (-1.781)	19.887*** (7.373)
flow_pct	39.043 (1.602)	-37.910 (-1.564)	-30.490 (-1.219)	-27.416 (-1.037)	-35.185 (-1.451)
exp_ratio	1.112*** (43.969)	-0.215*** (-7.661)	-0.003 (-0.137)	-0.016 (-1.368)	0.055*** (4.468)

broadly observe a trade-off between pure stock picking and pure market timing, as these two groups act in opposite directions for 65 out of the 94 characteristics. For funds with both skills, their stock holdings are in the same direction as pure stock-pickers (market timers) for 28 (57) characteristics. Considering statistical significance at 10% level for all three groups, we observe the same trade-offs for 35 out of 51 characteristics. Then, for funds with both skills, their stock holdings are in the same direction as pure stock-pickers (market timers) for 10 (35) characteristics.

Table S3: **Funds' Stock Holdings Characteristics Relative to the Zero Skill Funds**

This table compares funds' stock holdings characteristics in each mutually exclusive skill group to the benchmark group. We use 94 stock holdings characteristics collected by Green et al. [2017] to describe the cross-section of expected returns for stocks. In each row, we report Fama and MacBeth [1973] times-series averages of the coefficients from cross-sectional regressions of the monthly stock holding characteristic measure on indicators for each skill group, except for the "Zero Skill" group. At the 10% level among funds rejecting $H_0 : \alpha = 0$ or $\gamma = 0$, the "Both" group comprises funds with positive picking ($\alpha > 0$) and timing ($\gamma > 0$) skills, the "Picking" group comprises funds with positive picking and negative timing skills, the "Timing" group comprises funds with positive timing and negative picking skills, and the "Neither" group comprises funds with negative picking and timing skills. The "Zero Skill" group comprises all other funds. In parentheses below the coefficient estimates, we report t -statistics based on Newey and West [1987] standard errors with 12 lags. The sample period is from 1980 to 2018. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
agr	0.193*** (16.540)	-0.034*** (-7.115)	0.043*** (6.746)	0.000 (-0.003)	0.016*** (2.896)
acc	-0.021** (-2.449)	0.000 (0.426)	0.002 (1.507)	0.003*** (7.017)	-0.001** (-2.178)
absacc	0.069*** (39.384)	-0.004*** (-6.104)	0.008*** (6.910)	-0.001* (-1.853)	0.001 (1.104)
age	16.153*** (15.911)	-0.041 (-0.474)	-1.253*** (-18.670)	0.588*** (4.998)	-0.382*** (-4.025)
aeavol	0.676*** (20.937)	-0.016 (-1.251)	0.049*** (8.790)	-0.036*** (-6.172)	0.038*** (6.041)
bm	0.483*** (21.158)	0.019** (2.461)	-0.045*** (-3.591)	-0.010* (-1.821)	0.000 (-0.032)
bm.ia	33.162 (1.029)	-2.577 (-0.628)	-5.189 (-1.102)	1.715 (1.119)	4.926 (1.381)
baspread	0.028*** (21.622)	-0.002*** (-7.078)	0.002*** (9.986)	-0.001*** (-7.747)	0.001*** (3.692)
beta	1.062*** (73.667)	-0.083*** (-5.243)	0.092*** (6.323)	-0.012** (-2.070)	0.045*** (5.159)
cash	0.135*** (28.157)	-0.016*** (-7.013)	0.011*** (5.332)	-0.005*** (-4.057)	0.010*** (5.178)
cashdebt	0.265*** (39.740)	0.022*** (5.460)	0.010* (1.962)	0.009*** (3.095)	0.002 (0.406)
cashpr	6.569*** (4.193)	-1.190 (-1.314)	4.799*** (4.947)	0.880 (1.460)	0.755 (1.536)
cfp	0.073*** (9.136)	0.003** (2.080)	-0.002 (-0.803)	0.002 (1.078)	-0.005** (-2.524)
cfp.ia	16.038 (1.151)	-1.859 (-1.065)	-2.033 (-1.007)	0.648 (0.933)	1.822 (1.213)
chatoia	-0.008*** (-3.168)	-0.001 (-1.250)	-0.005*** (-2.741)	-0.001 (-1.340)	0.002*** (2.777)
chesho	0.168*** (9.618)	-0.034*** (-5.244)	0.028*** (3.370)	0.007** (2.475)	0.005 (0.959)

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
chempia	-0.106*** (-6.764)	-0.026*** (-5.269)	0.015*** (3.468)	0.005 (1.486)	0.009** (2.032)
chfeps	0.020*** (4.373)	-0.003** (-2.586)	0.000 (-0.491)	0.000 (0.370)	0.006*** (10.379)
chinv	0.012*** (10.640)	-0.001** (-2.060)	0.004*** (3.718)	0.001*** (3.071)	0.000 (0.721)
chmom	-0.006 (-0.411)	0.015*** (3.367)	0.001 (0.291)	-0.004** (-2.159)	-0.007** (-2.519)
chnanalyst	0.046 (1.118)	-0.032*** (-3.146)	0.033*** (3.623)	0.009 (1.304)	0.040*** (5.457)
chpmia	0.237 (1.021)	-0.044 (-0.675)	-0.027 (-0.457)	0.035 (0.576)	0.030 (0.936)
chtx	0.002*** (9.036)	-0.001*** (-6.660)	0.001*** (4.326)	0.000 (0.600)	0.001*** (4.288)
cinvest	-0.003** (-1.988)	0.001 (0.820)	-0.001 (-0.937)	0.002** (2.061)	0.001 (1.576)
convind	0.181*** (18.135)	-0.005 (-1.100)	-0.001 (-0.220)	-0.004** (-2.021)	0.001 (0.395)
currat	2.541*** (55.065)	-0.198*** (-7.350)	0.098*** (4.122)	-0.036*** (-3.152)	0.029 (1.238)
depr	0.220*** (19.344)	-0.007*** (-2.659)	0.016*** (7.194)	-0.004*** (-2.905)	0.010*** (7.020)
disp	0.073*** (22.068)	-0.005 (-1.417)	0.015*** (7.396)	-0.012*** (-9.543)	-0.005*** (-4.484)
divi	0.019*** (11.977)	-0.002 (-1.524)	0.005*** (4.036)	-0.002*** (-4.015)	0.002** (2.313)
divo	0.014*** (11.982)	-0.003*** (-3.564)	0.006*** (5.392)	-0.002*** (-4.230)	0.002*** (3.901)
dy	0.020*** (13.900)	0.004*** (3.890)	-0.005*** (-6.380)	0.000 (1.384)	-0.001** (-2.453)
ep	0.051*** (12.491)	0.009*** (5.646)	-0.008*** (-4.950)	0.004*** (8.043)	0.001 (0.497)

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
egr	0.203*** (14.779)	-0.040*** (-6.253)	0.056*** (6.180)	0.003 (0.799)	0.022*** (3.348)
ear	0.008*** (12.141)	-0.002*** (-6.835)	0.000 (1.345)	0.000*** (-2.705)	0.003*** (9.261)
fgr5yr	15.062*** (38.357)	-0.633*** (-4.084)	1.351*** (9.153)	-0.329** (-2.177)	1.176*** (12.358)
gma	0.410*** (46.808)	-0.005 (-1.393)	0.031*** (4.437)	0.006 (1.437)	0.011** (2.314)
grcapx	0.674*** (15.893)	-0.121*** (-5.407)	0.192*** (8.668)	-0.012 (-0.946)	0.057*** (3.542)
grltnoa	0.102*** (31.135)	-0.001 (-0.864)	0.015*** (9.209)	-0.003*** (-2.652)	0.003** (2.147)
hire	0.102*** (13.592)	-0.022*** (-5.462)	0.033*** (7.201)	0.000 (0.153)	0.010** (2.500)
herf	0.078*** (40.123)	-0.001 (-0.751)	0.001 (1.157)	0.000 (1.190)	0.002*** (3.817)
invest	0.087*** (15.108)	-0.009*** (-3.847)	0.023*** (5.971)	0.002 (1.456)	0.002 (0.788)
ipo	0.024*** (13.687)	-0.002 (-0.720)	0.016*** (6.046)	-0.002 (-1.564)	0.005*** (2.611)
indmom	0.164*** (5.728)	-0.007** (-2.324)	0.002 (1.091)	-0.002 (-1.454)	0.005*** (3.161)
ill	0.000*** (7.265)	0.000*** (-5.040)	0.000* (1.832)	0.000*** (-3.959)	0.000*** (-3.592)
idiovol	0.042*** (29.477)	-0.003*** (-6.881)	0.004*** (10.214)	-0.002*** (-11.498)	0.002*** (5.491)
lev	1.735*** (22.551)	-0.081* (-1.864)	-0.284*** (-5.358)	-0.045 (-0.754)	0.212*** (3.227)
mom1m	0.019*** (8.589)	-0.001 (-1.038)	0.002*** (3.960)	-0.001*** (-4.103)	0.002*** (4.221)
mom12m	0.253*** (9.323)	-0.055*** (-5.100)	0.032*** (3.789)	-0.008* (-1.848)	0.056*** (9.133)

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
mom36m	0.569*** (12.286)	-0.113*** (-5.920)	0.094*** (4.120)	0.012 (1.155)	0.073*** (5.480)
ms	4.734*** (72.003)	0.129*** (4.793)	-0.043** (-2.268)	0.100*** (6.548)	-0.054* (-1.877)
mve	15.156*** (99.016)	0.169** (2.159)	-0.343*** (-10.428)	0.195*** (9.555)	0.052 (1.280)
mve_ia	10492.590*** (7.273)	-1005.754*** (-3.339)	-2362.661*** (-8.534)	2057.214*** (5.920)	665.081*** (3.473)
nincr	1.235*** (36.358)	-0.135*** (-6.420)	0.083*** (4.729)	0.013 (1.457)	0.067*** (3.286)
nanalyst	17.065*** (56.257)	-0.304 (-0.923)	-1.505*** (-7.410)	0.792*** (6.434)	0.557*** (4.881)
operprof	0.917*** (65.779)	-0.027*** (-3.493)	0.039*** (2.921)	0.018** (2.520)	0.029*** (4.322)
orgcap	0.008*** (13.757)	0.000 (1.148)	0.000* (-1.654)	0.000 (-1.319)	0.000** (2.198)
pchcapx_ia	7.293*** (3.170)	-2.062* (-1.853)	0.058 (0.083)	0.863 (1.332)	0.501 (1.641)
pchcurrat	0.036*** (8.172)	-0.008*** (-2.952)	0.009*** (2.620)	-0.003* (-1.846)	0.002 (1.076)
pchdepr	0.045*** (9.144)	-0.009*** (-4.875)	0.005*** (2.752)	-0.003* (-1.963)	-0.001 (-1.022)
pchgm_pchsale	0.003 (0.833)	0.003 (1.036)	-0.002 (-0.670)	0.006*** (4.206)	0.002 (0.954)
pchsale_pchinvt	-0.031*** (-4.211)	-0.003 (-1.054)	-0.009* (-1.856)	-0.006 (-1.431)	0.001 (0.534)
pchsale_pchrect	-0.033*** (-6.492)	0.003 (1.187)	-0.007** (-2.283)	0.001 (0.366)	-0.005** (-2.161)
pchsale_pchxsga	0.008** (2.220)	-0.009*** (-7.311)	0.002 (1.085)	-0.001 (-1.042)	0.005*** (3.992)
pchsaleinv	0.092*** (9.092)	-0.025*** (-4.643)	-0.002 (-0.604)	-0.003 (-0.658)	0.000 (0.030)

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
pctacc	-0.908*** (-4.044)	-0.086** (-2.385)	-0.067* (-1.849)	0.102*** (4.675)	0.022 (0.624)
pricedelay	0.097*** (7.918)	0.008* (1.696)	-0.013*** (-5.018)	0.002 (0.874)	0.000 (-0.041)
ps	4.817*** (40.107)	-0.006 (-0.524)	-0.007 (-0.676)	0.027*** (3.104)	0.015* (1.648)
rd	0.096*** (27.185)	-0.008*** (-3.046)	-0.004*** (-2.774)	-0.002 (-1.176)	0.000 (-0.151)
rd_mv	0.035*** (21.523)	-0.003*** (-2.961)	-0.002** (-2.204)	-0.002*** (-4.522)	0.003*** (2.942)
rd_sale	0.120*** (9.427)	-0.046*** (-6.927)	0.024*** (3.862)	-0.018*** (-5.815)	0.011** (2.511)
realestate	0.301*** (116.483)	0.000 (0.122)	-0.008*** (-3.761)	0.010*** (6.472)	0.005*** (4.887)
retvol	0.021*** (22.831)	-0.002*** (-6.729)	0.002*** (9.476)	-0.001*** (-7.915)	0.001*** (4.452)
roaq	0.017*** (39.671)	0.000 (1.559)	0.000 (0.638)	0.001*** (7.892)	0.001** (2.245)
roavol	0.014*** (21.076)	-0.002*** (-9.636)	0.002*** (11.073)	-0.001*** (-6.438)	0.001*** (5.035)
roeq	0.040*** (54.359)	-0.001 (-1.360)	-0.001 (-1.161)	0.003*** (9.212)	0.002*** (3.755)
roic	0.117*** (38.987)	0.013*** (5.597)	0.000 (0.001)	0.011*** (7.803)	0.000 (0.084)
rsup	0.024*** (6.981)	-0.004*** (-4.067)	0.004*** (3.247)	-0.001 (-0.967)	0.005*** (4.511)
salecash	43.413*** (15.556)	4.310*** (3.657)	2.444*** (3.588)	1.613 (1.625)	-2.059*** (-3.162)
saleinv	28.251*** (21.154)	-0.340 (-0.752)	0.564 (1.381)	-1.331*** (-3.869)	-0.799* (-1.947)
salerec	11.423*** (72.310)	0.546* (1.830)	1.640*** (3.489)	-0.193 (-1.086)	0.688*** (4.096)

Dependent Variable	Zero Skill (Constant)	Both	Picking	Timing	Neither
secured	0.250*** (49.974)	-0.039*** (-3.657)	0.055*** (6.600)	-0.022*** (-6.544)	0.014** (2.240)
securedind	0.397*** (24.442)	-0.014** (-2.287)	0.024*** (6.493)	-0.001 (-0.489)	0.006 (1.503)
sfe	0.050*** (24.789)	0.000 (-0.243)	-0.004*** (-4.591)	0.007*** (4.699)	0.002*** (2.685)
sgr	0.174*** (15.078)	-0.034*** (-7.542)	0.039*** (8.107)	-0.001 (-0.603)	0.015*** (3.097)
sin	0.014*** (27.589)	0.003** (2.256)	0.002** (2.061)	0.000 (0.438)	0.003*** (5.893)
sp	1.224*** (14.173)	-0.022 (-0.949)	-0.133*** (-4.044)	-0.071*** (-3.716)	0.106* (1.862)
std_dolvol	0.522*** (23.375)	-0.021** (-2.252)	0.039*** (8.567)	-0.020*** (-6.190)	-0.009* (-1.669)
std_turn	3.806*** (20.705)	-0.370*** (-5.807)	0.561*** (12.701)	-0.258*** (-6.862)	0.432*** (7.236)
stdcf	1.981*** (6.121)	-0.521*** (-3.185)	0.735*** (3.019)	-0.364*** (-2.977)	0.190* (1.764)
sue	0.000 (0.996)	0.000 (-1.504)	0.000* (1.757)	0.000 (-0.745)	0.000*** (2.684)
tang	0.493*** (65.928)	-0.013*** (-9.212)	0.007*** (4.605)	-0.001 (-1.146)	0.007*** (5.197)
tb	0.126*** (4.420)	0.019 (1.056)	0.000 (-0.008)	0.000 (-0.038)	-0.010 (-0.820)
turn	1.398*** (12.848)	-0.103*** (-6.755)	0.128*** (12.036)	-0.064*** (-5.399)	0.141*** (8.146)
zerotrade	0.040*** (6.033)	-0.026*** (-4.805)	-0.009** (-2.386)	-0.021*** (-4.275)	-0.018*** (-3.420)

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