Taking Over the Size Effect:
Asset Pricing Implications of Merger Activity
Online Appendix

This not-for-publication document contains additional results for the paper "Taking Over the Size Effect: Asset Pricing Implications of Merger Activity."

OA.1 Real-Time Rolling Window TMA Factor

In this section, we describe the rolling window procedure used to construct the 'real-time' rolling window TMA factor. SDC and Thomson Reuters data begin in 1980. Thus, almost all characteristics that serve as input variables for the takeover likelihood model can be constructed from 1981–2020. There is one exception: the Bhagwat et al. (2016) industry measure requires two prior years of SDC deal data and can therefore be constructed from 1982–2020. For this reason, we define the industry activity variable using the Cremers et al. (2009) measure in 1981. For all years after 1981, we define the industry activity variable using the Bhagwat et al. (2016) measure.

We estimate the likelihood that a firm with be a takeover target in the next year using an expanding window, beginning with a minimum of five years. Once this window expands to cover a total of ten years, when then convert to a 10-year rolling window for the remainder of the sample. This implies that, from 1985–1990, we use an expanding window, and from 1990 onward, we use a 10-year rolling window. We use the estimated coefficients to construct a tradeable version of the takeover factor that covers the period 1986–2020.

OA.2 Return Decomposition Robustness Tests

In this section, we provide a variety of robustness tests with respect to the decomposition results in the main paper. These include: alternative event windows, alternative models for the normal return, placebo tests, an alternative merger and acquisition sample that includes withdrawn deals, and tests for calendar effects.

OA.2.1 Alternative Event Windows

We first consider the robustness of the size decomposition results to alternative event windows. Table 3 in the main paper defines target event windows as -30/+1 day around the announcement date. Table OA.1 reports decomposition results for two alternative target event windows: -10/+1 day around the announcement date (Panel A) and -1/+1 day around the announcement date (Panel B). In both panels in Table OA.1, target and acquirer returns are adjusted using the market model for the normal return, the acquirer event window is defined as -/+1 day around the announcement date, and the sample period extends from 1990–2020.

The size decomposition results in Table 3 in the main paper are robust to both alternative event windows. In Table OA.1, upon decomposing the size portfolio returns into M&A and residual components, we continue find that the M&A component accounts for all (or nearly all) of the measured size premium. All estimates of the target components of size portfolio returns in Table OA.1 are very similar to those reported in Table 3 in the main paper.

OA.2.2 Alternative Models for the Normal Return

We also consider the robustness of the size decomposition results to alternative models for the normal return. Table 3 in the main paper uses the market model to define the normal return. Table OA.2 reports decomposition results for two alternative models for the normal return: the constant return model (Panel A), and a single factor model where market betas are estimated using 250 trading days, ending on day -31 (Panel B). In all panels in Table OA.2, the target return is defined as -30/+1 day around announcement date and the acquirer return is defined as -/+1 day around announcement date.

The size decomposition results in Table 3 in the main paper are robust to both alternative models. In Table OA.2, upon decomposing the size portfolio returns into M&A and residual components, we continue find that the M&A component accounts for virtually all of the measured size premium. All estimates of the target and acquirer components of size portfolio returns in Table OA.2 are nearly identical to those reported in Table 3 in the main paper. Similar results also obtain when the normal return is defined using the Fama and French (1993) three-factor model.

OA.2.3 Placebo Tests

We next conduct two variations of 'placebo tests.' Results are reported in Table OA.3. The first test (Panel A of Table OA.3) retains the acquisition announcement dates but scrambles the firms involved in the deal by drawing a 'pseudo-target' and 'pseudo-acquirer' randomly from among firms within the same size portfolio. The second test (Panel B of Table OA.3) retains the actual target and acquirer firms, but scrambles the announcement date randomly. In both panels in Table OA.3, the target return is defined as -30/+1 day around announcement date, the acquirer return is defined as -/+1 day around announcement date, and target and acquirer returns are adjusted using the market model for the normal return.

If the real M&A announcement returns drive the decomposition results in the main paper, then we expect these placebo tests to yield negligible M&A return components. Consistent with this, for both sets of placebo tests we find that the M&A components of the decomposed portfolios are economically small and (generally) statistically insignificant.

OA.2.4 Withdrawn Deals

In this subsection, we consider an alternative merger and acquisition sample that includes withdrawn deals. A potential concern with the results in the main paper is that negative target returns associated with withdrawn or incomplete deals might offset the effects of positive returns for completed deals in our analysis. We first note that our main analysis excludes incomplete takeover contests entirely. For deals that are ultimately withdrawn, this implies that we exclude positive target deal announcement returns (on average) for such deals, as well as potentially negative target returns associated with ultimate deal failure.

As a robustness check, in this subsection we analyze the M&A component of size portfolio returns for withdrawn deals as well as a pooled sample of completed and withdrawn deals, where we include an additional $[-30, +30]$ window around the SDC-reported withdrawal date for withdrawn deals.

Table OA.4 reports decomposition results for various size portfolios. Panel A of Table OA.4 tabulates the decompositions with respect to the M&A sample that includes only those deals that were subsequently withdrawn. Panel B tabulates the decompositions with respect to the M&A sample that includes both withdrawn and completed deals. For withdrawn deals, target announcement returns are defined as -30/+1 days around the announcement date, and -30/+30 days around the withdrawal date. For completed deals, target announcement returns are defined as -30/+1 days around the announcement date. The acquirer returns for both completed and withdrawn deals are defined as -1/+1 days around the announcement and withdrawal dates. Target and acquirer returns are adjusted using the market model for the normal return.

Table OA.4 shows that decomposition results that include only the sample of withdrawn deals yield economically small and statistically insignificant M&A components. Decomposition results that include the full sample of completed and withdrawn deals yield results that are very similar to, and in some cases slightly larger in magnitude, those reported in the main paper.

OA.2.5 Calendar Effects

In this section, we consider whether calendar effects impact our decomposition results. Alquist et al. (2018) show that the size premium is concentrated in January. Asness et al. (2018) show that, upon controlling for measures of firm quality, the size premium is more balanced across each calendar month and is no longer concentrated in January. To the extent that M&A announcements cluster in particular months or on particular days of the week, it is possible that calendar effects impact the average decomposition results reported in Table

3 in the main paper.

In Table OA.5, we repeat the decomposition analysis from Table 3 in the main paper. In Panel A, we separately report average returns for January versus all other months. In Panel B, we separately report average returns for each day of the week. Target announcement returns are defined as -30/+1 days around the announcement date, and acquirer announcement returns are defined as -1/+1 days around the announcement and withdrawal dates. Target and acquirer returns are both adjusted using the market model for the normal return.

We find that the decomposition results reported in Table 3 in the main paper are robust to excluding the month of January and robust across days of the week. Target and acquirer return components are similar in January versus February–December. In unreported results, we confirm that M&A announcements are fairly balanced across each month of the year in our sample. Results in Panel B of Table OA.5 indicate that target return components tend to be larger on average on Mondays relative to other days of the week. In unreported results, we find that M&A announcements occur on Mondays more often than other days of the week in our sample. Despite this, however, we continue to find large, significantly positive target and acquirer return components for all days of the week that are similar in magnitude to results reported in the main paper for all days of the week.

OA.3 M&A Activity and Other Factors

This section considers whether merger and acquisition activity impacts measured expected returns for other prominent factors and anomaly long-short portfolios. Table OA.6 reports decomposition results for an additional 45 anomaly portfolios. Long/Short portfolios are based on quintile sorts. For all anomalies in Table OA.6, the target return is defined as -30/+1 day around announcement date, the acquirer return is defined as -/+1 day around announcement date, and target and acquirer returns are adjusted using the market model for the normal return. Details regarding the construction of each anomaly appear in Table

OA.7. Panel A of Table OA.7 describes the anomalies that are rebalanced annually at the end of June. Panel B describes the anomalies that are rebalanced monthly.

Many of the hedge portfolios considered in Table OA.6 lack the particular characteristics exhibited by size-based hedge portfolios that drive significant M&A return components. For example, acquisition activity is relatively balanced across the long and short legs of standard hedge portfolios based on the book-to-market characteristic. Moreover, the market capitalization of the median firm in each of such portfolios is relatively similar. This implies that the M&A component of average returns is small for the value factor and related long-short portfolios based on book-to-market ratios. Other anomalies that do not exhibit a significant M&A expected return component include beta arbitrage, bid-ask-spread, industry momentum, and investment growth. The market capitalization of the median firm in long versus short leg for each of these characteristics is relatively similar.

Although many anomaly long-short portfolios do not exhibit a significant average M&A return component, there are some exceptions. For example, we find that an economically significant M&A return component exists for portfolios formed based on the gross profitability characteristic (Novy-Marx (2013)). In contrast to size, the average M&A component for long-short portfolios based on gross profitability is *negative* rather than positive. This occurs because less profitable firms that appear in the short leg of the gross profitability hedge portfolio tend to be smaller and more likely to become targets. Other anomalies that exhibit a significant M&A expected return component include idiosyncratic volatility, net issuance, price, and several multi-characteristic strategies that involve profitability (e.g., value-profitability). There is a significant difference in the market capitalization of firms in the long versus the short leg for each of these characteristics.

OA.4 Estimated Takeover Likelihood and Component Characteristics

Many of the firm characteristics used to estimate takeover likelihood in Table 8 in the main paper have previously been linked to the cross-section of returns. For example, many studies have documented a negative association between firm size and returns (e.g., Banz (1981), Fama and French (1992)). Firm size negatively predicts takeover likelihood. Thus, a necessary robustness test considers whether any of the *individual* variables used to estimate takeover likelihood drive the result that takeover likelihood is positively related to the cross-section of returns. To evaluate this possibility, we report Fama-MacBeth regressions of annual returns on takeover probability and each individual characteristic used to estimate takeover likelihood, as well as several other firm characteristics the literature has shown relate to returns. Results are reported in Table OA.8. The dependent variable is defined as the firm's cumulative 12-month return from the beginning of July in year t to the end of June in year $t+1$. Takeover likelihood is calculated using the coefficients estimated in Model 4 in the main paper and the SDC sample period (1990–2020). ln(MktCap), Q, PPE, ln(Cash), BLOCK, Industry (BDH), Leverage, ROA, Dividend, LRET, and Idiosyncratic Volatility are all defined as in the logistic regression model in Table 8 in the main paper. Additional control variables include Book-to-Market, Investment growth, Short-Term Reversal, Momentum, and Turnover.[1]

In all regressions in Table OA.8, the takeover likelihood coefficient remains positive, significant, and stable in magnitude. This confirms that takeover likelihood is robustly positively related to the cross-section of returns, and that no *single* variable used to estimate takeover likelihood drives this result.

[1]Coefficient estimates for Book-to-Market, Investment growth, Short-Term Reversal, Momentum, and Turnover are not reported to conserve space, but are nearly identical to those reported in Table 9 in the main paper.

OA.5 Takeover Likelihood-Sorted Portfolio Returns

As a robustness check for the cross-sectional return results reported in Section 5 in the main paper, in this section we analyze the returns of portfolios sorted by the versions versions of the takeover likelihood characteristic. We consider three different models from Table 8 in the main paper for the takeover likelihood characteristic: Models 2, 4, and 5. We also consider two samples: the SDC sample (1990–2020) and the Real-time Rolling Window (2000–2020). Table OA.9 reports raw returns and alphas with respect to the Fama and French (2015) five-factor model for portfolios sorted into quintiles based on estimates of takeover likelihood. In all cases, we find that average portfolio returns and alphas increase from Quintile 1 (lowest predicted takeover likelihood) firms to Quintile 5. These returns and alphas are monotonically increasing from Quintile 1 firms to Quintile 5. In addition, long-short returns and alphas based on quintiles or deciles of takeover likelihood are economically and statically significantly positive, ranging from approximately 0.47% – 1.06% per month.

OA.6 Factor Betas

In this section, we report factor loadings for several of the spanning regressions conducted in Tables 11 and 12 in the main paper. In Table OA.10, we report TMA factor loading for three benchmark models: FF3 + UMD, FF5 + UMD, and FF5 + UMD + QMJ. All three versions of the TMA (SDC Sample, Extended Sample, and Rolling Window) load positively and significantly on size factor SMB and the profitability factor RMW, and negatively on the market factor. The estimated market beta is around -0.2 for the SDC and Extended sample versions of the TMA, and is around -0.1 for the Rolling Window version of the TMA. The various versions of the TMA also load positively on the value factor HML, although the estimated coefficients are not significant in all spanning regressions.

In Table OA.11, we report SMB factor loading for two benchmark models: FF5 - SMB + TMA + UMD and FF5 - SMB + TMA + UMD + QMJ. We consider four different samples and versions of the TMA. Consistent with Asness et al. (2018), the SMB factor loads negatively on the QMJ factor. In addition, the SMB factor loads strongly and positively on the TMA factor for all samples and versions of the TMA. In Table OA.12, we report size-sorted decile portfolio factor loadings for the FF5 - SMB + TMA + UMD + QMJ benchmark model. Size portfolio returns are obtained from Ken French's website. D1 corresponds to the smallest size decile, and D10 corresponds to the largest size decile. We find that size-sorted portfolios exhibit a strong, monotonic decreasing pattern of loadings on TMA.

Collectively, these results are consistent with the notion that the TMA factor prices the SMB factor and this fact 'explains' why including TMA in the benchmark models reduces alphas for the SMB.

OA.7 Alternative Takeover Likelihood Models

Our results in the main paper suggest that the asset pricing relevance of the market capitalization characteristic operates primarily via its role in capturing takeover exposure. To explore this hypothesis further, in this section we consider the performance of a takeover factor constructed from a takeover likelihood model that omits the market capitalization characteristic. We also estimate versions of the model that employ measures of firm size that do *not* involve market prices, namely log book assets and log sales. Results are reported in in Table OA.13. The first column (Model 6) excludes firm size from the model, but is otherwise identical to Model 4 in Table 8 in the main paper. The second column (Model 7) replaces ln(MktCap) with the natural log of book assets. The third column (Model 8) replaces ln(MktCap) with the natural log of sales. To aid in a more direct comparison to ln(MktCap), we do not industry-adjust ln(Book Assets) or ln(Sales). Finally, the fourth column of Table OA.13 (Model 9) replaces Q with the natural log of book assets.

Omitting market capitalization from the takeover model or substituting the alternative firm size measures significantly lowers the predictive power of the model. As a concrete example, consider the Model 8 variation that substitutes log sales for market capitalization as the firm size measure. We obtain a negative and significant coefficient on log sales in the takeover model, similar to that for market capitalization. However, measures of model fit fall significantly. As an additional comparison point, we conduct a similar exercise that substitutes book assets for market-book (Q) from our main takeover model, rather than market capitalization. In this case, we obtain a significantly negative (positive) coefficient on market cap (Q), consistent with our main takeover model, and we do not observe a significant impact on the predictive power of the model.

The results in Table OA.13 suggest that the critical information in market capitalization's role in predicting takeover likelihood pertains less to firm operational size and more to the information embedded in current market prices. We investigate the asset pricing performance of takeover factors constructed from Models 6–9 below.

OA.8 Excluded Factor Regression Robustness Tests

In this section, we replicate the analysis in Tables 11 and 12 in the main paper using three alternative models to estimate takeover likelihood. We report results for excluded factor regressions, where the takeover likelihood characteristic is estimated using Models 2 and 5 from of Table 8 in the main paper, as well as for Models 6, 7, 8, and 9 from Table OA.13.

OA.8.1 TMA Excluded Factor Regressions

In this subsection, we replicate the analysis in Table 11 in the main paper using three alternative takeover likelihood models, and report results in Table OA.14. In Panel A, we report results for the Model 2 version of takeover likelihood. In Panel B, we report results for the Model 5 version of takeover likelihood. In Panels C, D, E, and F, we report results for Model 6, 7, 8, and 9, respectively. Rows correspond to alternative factor models described in the row labels. The first column reports the estimated alpha and corresponding t-statistic of the spanning regression. The statistic $Sh^2(f)$ shows the squared maximum Sharpe ratio obtainable from the benchmark (right-hand-side) factors. The statistic $\alpha^2/s^2(\epsilon)$ is the squared ratio of the estimated alpha to the estimated standard deviation of the regression residuals. This statistic conveys the increase in squared Sharpe ratio that results from augmenting the benchmark factors with the TMA factor.

Focusing first on Panels A and B, we find that the results in Table 11 in the main paper are robust to Models 2 and 5 for takeover likelihood. We continue to find that the estimated alphas associated with TMA factor returns are positive, statistically significant, and economically significant in magnitude for all of the excluded factor regressions. The positive α estimates associated with the excluded (left-hand side) TMA returns are reasonably stable in magnitude as we consider richer factor models. The (unreported) adjusted R^2-values from the spanning regressions in Table OA.14 show that a significant portion of the time series variation in the takeover factor is unexplained by the various benchmark factor models. Finally, the $Sh^2(f)$ and $\alpha^2/s^2(\epsilon)$ statistics show that adding TMA to the benchmark factors delivers economically significant improvements in the sense of substantially increasing the maximum Sharpe ratio associated with the factors. Altogether, the results in Panels A and B of Table OA.14 are consistent with those in Table 11 in the main paper, and strongly favor models that include the takeover factor relative to analogs that omit this factor.

The results in Panel C, D, and E of Table OA.14 are quite different. In this case, the alpha estimates are approximately one-third to one-half of the magnitude of the corresponding alphas in Panels A and B. In addition, several of the alpha estimates have t-statistics near or just below the conventional 1.65 cutoff. Finally, the $\alpha^2/s^2(\epsilon)$ statistics show that adding this version of the TMA to the benchmark factors does not increase the maximum Sharpe ratio associated with the factors by the same magnitude as the versions of the TMA presented in Panels A and B. Altogether, the results in Panels C, D, and E of Table OA.14 suggest that omitting market capitalization from the takeover model or substituting the alternative firm size measures results in reduced alphas for the corresponding takeover factor, in addition to significantly lowering the predictive power of the model. We also note that the comparison Model 9 presented in Panel F, which substitutes book assets for Q as opposed to market cap, performs similarly to Models 2-5.

We draw two conclusions from Models 6–9. First, results support the hypothesis that the market capitalization characteristic relates to cross-sectional returns via its role in capturing differences in takeover exposure. Second, the results indicate that the critical information in market capitalization pertains less to firm operational size and more to the information embedded in current market prices.

OA.8.2 SMB Excluded Factor Regressions

In this subsection, we replicate the analysis in Table 12 in the main paper using six alternative takeover likelihood models. In Table OA.15, we run another set of excluded factor regressions, in which we regress monthly returns for the SMB factor on factor returns for various benchmark models. Each pair of rows in the table contrasts a benchmark model without and with the takeover factor included.

Focusing first on Panels A and B of Table OA.15, we find that the results in Table 12 in the main paper are robust to the alternative Models 2 and 5 for takeover likelihood. We continue to find that including the TMA factor significantly decreases the alpha associated with the SMB factor and often flips the sign of the estimated alpha from positive to negative. For example, the results in row 3 include the market factor and the QMJ factor proposed by Asness et al. (2019). Consistent with results in Asness et al. (2018), controlling for the 'quality' factor produces a positive and significant alpha for the SMB factor. Row 4 adds the TMA factor. This addition causes the SMB alpha estimate to become negative and insignificant in Panels A and B. This general pattern plays out across a wide variety of benchmark models. Altogether, the results in Panels A and B Table OA.15 are consistent with those in Table 12 in the main paper, and indicate that versions of popular models modified to include TMA can either price the SMB factor portfolio, or benefit relatively little from the addition of this factor.

Similar to Table OA.14, the results in Panel C of Table OA.15 suggest that firm size is an important component of the takeover likelihood model. In this case, the SMB factor generates a borderline significant alpha for both the modified CAPM model ($MKT+QMJ+TMA$) and the modified Fama-French six-factor model ($FF5 - SMB + UMD + TMA + QMJ$). Results are qualitatively similar for Models 7 and 8, consistent with the notion that the critical information in market capitalization pertains less to firm operational size and more to the information embedded in current market prices.

OA.9 Left-Hand-Side Asset Pricing Tests

The asset pricing tests in the main paper focus on factor-spanning regressions in the spirit of Barillas and Shanken (2017). In this section, we consider a popular alternative approach that evaluates the size of pricing errors for a specified set of 'left-hand-side' test assets. Given the critique of Lewellen et al. (2010) regarding the use of size- and book-to-market sorted portfolios to assess asset pricing models, we focus on broader sets of test assets employing various portfolios associated with anomaly characteristics. Specifically, we consider a total of 200 left-hand-side portfolios from 5x5 sorts on size or takeover likelihood and, independently, book-to-market, profitability, investment, or momentum. We also consider a variety of model performance statistics. These include the Gibbons et al. (1989) GRS statistic and p-value; the average absolute intercept ($A|a|$); the average squared intercept divided by the average squared difference between the average return on LHS portfolio i and the average return on the value-weighted market ($Aa_i^2/A\bar{r}_i^2$); the average R-squared ($A(R^2)$); and the maximum squared Sharpe ratio for the model's factors ($Sh^2(f)$).

We compare the performance of four popular factor models that include the SMB factor to four similar models that replace the SMB factor with the TMA factor. We focus on the SDC sample (1990–2020) and the Model 4 version of the TMA. We consider four prominent factor models from the literature: the Fama and French (1993) three-factor model, the three-factor model augmented with the Carhart (1997) momentum factor, the Fama and French (2015) five-factor model, and the Fama and French (2018) six-factor model. Results are reported in Table OA.16.

Consistent with the asset pricing tests reported in the main paper, the results in Table OA.16 indicate that models that include TMA as opposed to SMB produce smaller pricing errors. This is illustrated by the smaller GRS statistics for the majority of comparison TMA models, the smaller average absolute intercepts, the smaller $Aa_i^2/A\bar{r}_i^2$, and the larger maximum squared Sharpe ratios.

OA.10 Takeover Likelihood Linear Probability Model

The takeover likelihood model includes a variety of firm characteristics, several of which have been associated with cross-sectional return patterns (e.g., firm size, book-to-market, and ROA). The logistic regression model applies a nonlinear transformation, raising the question of whether this nonlinear transformation is essential to the asset pricing success of the TMA factor. To address this question, we apply an alternative linear probability model (LPM) using the same firm variables included in Model 4 of Table 8 in the main paper, and focusing on the SDC sample period. We present key results for the LPM model in this section.

OA.10.1 Takeover Probability Model

We present firm-level estimates of takeover likelihood based on a linear regression model in Table OA.17. We consider the same firm variables included in Model 4 of Table 8 in the main paper, and focus on the SDC sample period (1990–2020). The dependent variable is a target indicator variable that takes the value of one if a firm is a target in that year. All independent variables are defined as in Table 8 in the main paper.

All coefficient estimates for the LPM in Table OA.17 are approximately the same sign and significance as those estimated using the similar logistic probability model in column (4) in Table 8 in the main paper. Firm size, past returns, and idiosyncratic volatility are all significantly negatively related to takeover likelihood. Industry acquisition activity and the presence of a blockholder are significantly positively related to takeover likelihood.

OA.10.2 Asset Pricing Results

We first consider the robustness of the Fama-MacBeth regression results in Table 9 in the main paper to the alternative linear probability model version of takeover likelihood. In unreported results, we confirm that Fama-MacBeth regression coefficients for the LPM takeover likelihood characteristic are the same sign and significance as those reported in Table 9 in the main paper. We also find that the coefficient estimate associated with firm size is significantly positive in a regression that includes the LPM takeover likelihood characteristic and a variety of control variables, implying that, conditional on LPM takeover probability and other prominent characteristics, larger firms earn *higher* average returns.

Finally, we consider replications of Tables 11 and 12 in the main paper using a version of the TMA factor constructed from the LPM takeover likelihood characteristic. In Table OA.18, we report excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). In Panel A, the dependent variable is the LPM TMA factor and the independent variables are the factors that correspond to the factor model in the row labels. In Panel B, the dependent variable is the size factor, and the factor models (independent variables) replace the SMB factor with the corresponding linear probability model TMA factor.

In Panel A of Table OA.18, we continue to find that the estimated alphas associated with TMA factor returns are positive, statistically significant, and economically significant in magnitude for all of the excluded factor regressions. In addition, the relatively modest (unreported) R^2-values show that a significant portion of the time series variation in the LPM takeover factor is unexplained by the various benchmark factor models. Finally, the $Sh^2(f)$ and $\alpha^2/s^2(\epsilon)$ statistics show that adding the LPM TMA to the benchmark factors delivers economically significant improvements in the sense of substantially increasing the maximum Sharpe ratio associated with the factors. This is consistent with the results reported in Table 11 in the main paper, where takeover likelihood is estimated using the logistic regression model.

In Panel B of Table OA.18, we once again find that the alpha estimates associated with SMB are economically small and insignificantly different from zero for models that include the LPM TMA. In addition, the $Sh^2(f)$ statistics for the benchmark models in Panel B of Table OA.18 that include TMA are substantially larger than analogs in Panel A. The $\alpha^2/s^2(\epsilon)$ statistics show that augmenting the benchmark models that incorporate the LPM TMA with the size factor yields only marginal improvements in the corresponding max Sharpe ratios. Altogether, the results reported in Panel B of Table OA.18 are consistent with the results in Table 12 in the main paper and indicate that versions of popular models modified to include TMA can either price the SMB factor portfolio, or benefit relatively little from the addition of this factor.

Collectively, we obtain qualitatively similar asset pricing results using this LPM version of the takeover characteristic and the corresponding factor. This indicates that the nonlinear logistic transformation is not an essential feature of the takeover likelihood model. Additional tests reported in Table OA.8 show that the relation between the takeover characteristic and cross-sectional expected returns is not driven by any *single* characteristic included in the takeover model. Consequently, this suggests that the TMA factor can be viewed as a factor constructed from a relatively high dimensional set of characteristics (the inputs to the takeover model) with weights determined via a particular *economic* criterion (the ability to capture takeover exposure). This contrasts with approaches that derive factors from a large set of characteristics using statistical criteria, such as principal components analysis.

OA.11 TMA and the Value Factor

Cremers et al. (2009) speculate that the takeover factor's ability to price size and book-to-market sorted portfolios arises because the takeover factor is related to the HML factor. However, we find that takeover activity is relatively balanced across book-to-market-based hedge portfolios (see Table OA.6). In addition, in Table 10 in the main paper, we find that the correlations between various TMA factor versions and the HML factor are generally positive but much weaker than the corresponding correlation between the TMA and SMB factors. Collectively, these results cast doubt on the suggestion that the takeover factor is strongly related to the HML factor. In this section, we further consider this possibility by running a set of spanning regressions, in which we regress monthly returns for the *HML factor* on factor returns for various models that include the takeover factor.

Table OA.19 presents results of spanning regressions for HML. In Panel A, we consider the full extended sample period (1963–2020). Several studies have documented a substantial decline in the value premium since approximately 1990 (e.g., Fama and French (2021) and Smith and Timmermann (2021)). For this reason, in Panels B and C, we consider a partition of the extended sample period. Consistent with the well-documented value effect, we obtain a significant, positive alpha estimate for the market model in Panels A and B; however this estimate deteriorates in recent decades and is insignificantly different from zero in Panel C. We find that TMA has only a modest impact on alphas for HML in subsequent regressions. For example, over the extended sample period, we obtain a significant alpha estimate of around 0.33 for HML for the market model. Adding TMA to the RHS factors reduces the alpha to 0.20, but it remains marginally significant. Regressing HML on MKT+TMA+UMD again gives a significant alpha of around 0.32. Alphas for HML are insignificant for extended models that include (relatively) new factors such as profitability and investment, and for the 'factors that fit' model of Lettau and Pelger (2020). But this point has been made before, e.g., Fama and French (2015), and TMA does not appear to play a crucial role in this regard. Collectively, the results reported in Table OA.19 indicate that the TMA factor is not closely related to the value factor.

OA.12 TMA and the Investment Factor

Mergers and acquisitions offer an alternative channel for firm asset growth relative to capital expenditures and our takeover models indicate that high investment firms are less likely to be targets, ceteris paribus. One might therefore conjecture that the TMA factor will subsume the CMA investment factor. However, we find that takeover activity is relatively balanced across investment growth-based hedge portfolios (see Table OA.6). In addition, in Table 10 in the main paper, we find weak correlations between various TMA factor versions and the CMA factor. This provides preliminary evidence that the TMA factor does not price the CMA. In this section, we consider whether there remains support for the inclusion of an investment factor once the takeover factor is included in asset pricing models. To address this question, we run yet another set of spanning regressions, in which we regress monthly returns for the *CMA factor* on factor returns for various models that include the takeover factor.

Table OA.20 presents results of spanning regressions for CMA. Consistent with the weak pairwise correlation between the TMA and the CMA, we find that the TMA does not price the CMA. The alpha estimates associated with CMA are relatively unaffected by the inclusion of the TMA factor. In addition, the TMA coefficient in nearly all excluded factor regressions is small in magnitude and statistically insignificant. We note, however, that the alpha estimates associated with CMA are somewhat small in magnitude and statistically weak in many cases. The $\alpha^2/s^2(\epsilon)$ statistics show that augmenting the benchmark models that incorporate TMA with the investment factor yields marginal improvements in the corresponding max Sharpe ratios that are generally greater than those associated with the size factor, but much smaller than those associated with the TMA factor. Collectively, the results reported in Table OA.20 indicate that the TMA factor does not fully explain the investment factor. However, there is only weak support for the inclusion of the CMA factor. This is consistent with Linnainmaa and Roberts (2018), who do not find out-of-sample support for the investment anomaly, and is in stark contrast to the strong support for the takeover factor.

OA.13 Firm Quality and Takeover Likelihood

Although a number of recent studies challenge the relevance of the traditional size factor of Fama and French (1993) (e.g., Alquist et al. (2018)), Asness et al. (2018) find robust evidence for the size premium upon controlling for measures of firm quality, suggesting continued relevance for the size factor in asset pricing models. Asness et al. (2018) suggest that quality revitalizes the size effect because firm size is positively correlated with firm quality, and firm quality is positively related to expected returns. Thus, the size effect is fighting the quality effect and failing to control for this significantly understates the true size premium. Motivated by this, we confirm that the SMB factor obtains significant positive alphas for several models in Table 12 in the main paper that include the QMJ factor but not the TMA factor. We then show that augmenting these models with the TMA factor significantly decreases the alpha associated with the SMB factor. Collectively, the results in Table 12 in the main paper indicate that versions of popular models modified to include TMA can either price the SMB factor portfolio, or benefit relatively little from the addition of this factor, even when controlling for the quality factor.

In this section, we explore the possibility that firm quality relates to takeover likelihood. We begin by estimating a modified version of the quality characteristic from Asness et al. (2019, hereafter 'AFP'). In AFP, this characteristic is constructed using 16 input variables that form Profitability, Growth, and Safety scores, which are then averaged to form a quality score. AFP measure firm growth variables over five-year intervals. Given that takeover targets are frequently young firms with relatively few years of CRSP and Compustat data, we modify this approach and measure all firm growth variables over one-year intervals. In addition, AFP include a measure of market beta in their safety score that is estimated using rolling one-year daily standard deviations and rolling five-year three-day correlations, following Frazzini and Pedersen (2014). We use one-year rolling daily market betas to minimize data requirements. Finally, AFP also include a measure of earnings volatility in their safety score that requires 60 quarters of income and book equity data. In light of the difficulties associated with measuring earnings volatility over shorter intervals, we omit this variable from our measure of firm safety. We confirm that a factor formed based on this modified quality characteristic generates a significantly positive alpha with respect to the Fama-French-Carhart four-factor model. In addition, we confirm that the time series correlation between this modified quality factor and the QMJ factor provided by AFP exceeds 68%.

We present firm-level estimates of takeover likelihood based on a logistic regression model in Table OA.21. We consider the same RHS firm variables included in Model 4 of Table 8 in the main paper, in addition to the modified measures of firm quality. The dependent variable is a target indicator variable that takes the value of one if a firm is a target in that year. All control variables are defined as in Table 8 in the main paper. We find that firm quality negatively relates to takeover likelihood, but this relation becomes insignificantly different from zero when we include the additional control variables from Model 4 in the main paper. Breaking down the elements that comprise the quality measure, this appears to be primarily due to a negative relation between the 'safety' component of the measure and takeover likelihood. Insofar as quality essentially reflects an alternative valuation measure, the direction of the estimated effect is consistent with those for market capitalization and Q.

Despite our attempt to construct a version of the AFP quality measure that minimizes CRSP and Compustat data requirements, we still loose over 70% of our takeover target observations when we include firm quality as an additional RHS variable in the takeover likelihood regressions. This imposes a significant limitation on our ability to construct an effective takeover factor. Nonetheless, we confirm that a takeover factor constructed from Model 2 in Table OA.21 generates asset pricing results that are similar to those reported in Tables 9 –12 in the main paper.

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Table OA.1: **M&A Component of Size Portfolios – Alternative Target Windows**

This table reports value-weighted daily returns for various size portfolios, as well as a decomposition of the value-weighted returns into M&A and Residual components. Long/Short size portfolios are based on median, quintile, and decile sorts. All returns are annualized (scaling by 250 trading days per year) and expressed in percentage points. Robust standard errors are reported in parentheses. The Three-Factor SMB portfolio is constructed as in Fama and French (1993). The Five-Factor SMB portfolio is constructed as in Fama and French (2015). Robust standard errors are reported in parentheses. The acquirer return is defined as +/-1 day around announcement date. In Panel A, the target return is defined as -10/+1 days around announcement date. In Panel B, the target return is defined as +/-1 day around announcement date. Both target and acquirer returns are adjusted for the market return. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: -10/+1 day Target Window

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	11.38	1.35	0.23	1.12
Above Median	(B)	11.73	11.52	0.22	-0.04	0.26
Decile	1	12.23	10.53	1.71	0.26	1.45
Quintile	1	12.46	10.77	1.69	0.29	1.40
	2	12.69	11.44	1.25	0.21	1.04
	3	12.73	11.61	1.12	0.16	0.96
	4	13.19	12.41	0.79	0.12	0.67
Quintile	5	11.59	11.49	0.10	-0.07	0.17
Decile	10	11.44	11.40	0.04	-0.07	0.11
Long-Short	SMB	0.99	-0.14	1.13 ***	0.27 ***	0.86 ***
Median		(1.771)	(1.758)	(0.071)	(0.060)	(0.037)
Long-Short	1-5	0.87	-0.72	1.60 ***	0.36 ***	1.23 ***
Quintiles		(2.223)	(2.209)	(0.087)	(0.069)	(0.053)
Long-Short	1-10	0.80	-0.87	1.67 ***	0.33 ***	1.34 ***
Deciles		(2.343)	(2.328)	(0.097)	(0.082)	(0.055)
Three-Factor	SMB	1.33	0.28	1.06 ***	0.22 ***	0.84 ***
		(1.652)	(1.642)	(0.061)	(0.046)	(0.041)
Five-Factor	SMB	1.46	0.38	1.08 ***	0.25 ***	0.83 ***
		(1.665)	(1.655)	(0.064)	(0.051)	(0.039)

Table OA.1 Cont.

Panel B: -1/+1 day Target Window						
Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	11.52	1.20	0.23	0.97
Above Median	(B)	11.73	11.55	0.18	-0.04	0.22
Decile	1	12.23	10.67	1.57	0.26	1.31
Quintile	1	12.46	10.92	1.54	0.29	1.25
	2	12.69	11.56	1.13	0.21	0.92
	3	12.73	11.74	0.99	0.16	0.83
	4	13.19	12.51	0.69	0.12	0.57
Quintile	5	11.59	11.51	0.08	-0.07	0.14
Decile	10	11.44	11.41	0.03	-0.07	0.10
Long-Short	SMB	0.99	-0.03	1.02 ***	0.27 ***	0.75 ***
Median		(1.771)	(1.761)	(0.069)	(0.060)	(0.035)
Long-Short	1-5	0.87	-0.59	1.46 ***	0.36 ***	1.10 ***
Quintiles		(2.223)	(2.212)	(0.084)	(0.069)	(0.050)
Long-Short	1-10	0.80	-0.74	1.54 ***	0.33 ***	1.21 ***
Deciles		(2.343)	(2.331)	(0.095)	(0.082)	(0.052)
Three-Factor	SMB	1.33	0.39	0.95 ***	0.22 ***	0.73 ***
		(1.652)	(1.645)	(0.058)	(0.046)	(0.035)
Five-Factor	SMB	1.46	0.48	0.98 ***	0.25 ***	0.72 ***
		(1.665)	(1.657)	(0.062)	(0.051)	(0.036)

Table OA.2: **M&A Component of Size Portfolios – Alternative Normal Return Models**

This table reports value-weighted daily returns for various size portfolios, as well as a decomposition of the value-weighted returns into M&A and Residual components. Long/Short size portfolios are based on median, quintile, and decile sorts. All returns are annualized (scaling by 250 trading days per year) and expressed in percentage points. Robust standard errors are reported in parentheses. The acquirer return is defined as +/-1 day around announcement date. The target return is defined as -30/+1 days around announcement date. The Three-Factor SMB portfolio is constructed as in Fama and French (1993). The Five-Factor SMB portfolio is constructed as in Fama and French (2015). In Panel A, target and acquirer returns normal returns are estimated using the constant return model. The constant normal return is calculated over 250 trading days, ending on day -31. In Panel B, target and acquirer normal returns are estimated using the single factor model. Market betas are estimated using 250 trading days, ending on day -31. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Constant Return Model

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	11.40	1.32	0.16	1.17
Above Median	(B)	11.73	11.62	0.11	-0.15	0.26
Decile	1	12.24	10.55	1.69	0.20	1.49
Quintile	1	12.46	10.77	1.69	0.22	1.47
	2	12.69	11.45	1.24	0.14	1.10
	3	12.73	11.68	1.05	0.06	0.99
	4	13.19	12.48	0.71	0.05	0.66
Quintile	5	11.59	11.60	-0.01	-0.18	0.17
Decile	10	11.44	11.52	-0.08	-0.20	0.12
Long-Short	SMB	0.99	-0.22	1.21 ***	0.31 ***	0.90 ***
Median		(1.771)	(1.755)	(0.090)	(0.081)	(0.043)
Long-Short	1-5	0.87	-0.83	1.70 ***	0.41 ***	1.29 ***
Quintiles		(2.223)	(2.200)	(0.109)	(0.095)	(0.060)
Long-Short	1-10	0.80	-0.97	1.77 ***	0.39 ***	1.38 ***
Deciles		(2.343)	(2.313)	(0.125)	(0.112)	(0.062)

Table OA.2 Cont.

Panel A cont.						
Three-Factor	SMB	1.33	0.23	1.10 ***	0.23 ***	0.88 ***
		(1.652)	(1.638)	(0.078)	(0.060)	(0.051)
Five-Factor	SMB	1.46	0.31	1.15 ***	0.28 ***	0.87 ***
		(1.665)	(1.651)	(0.080)	(0.067)	(0.046)

Panel B: Single Factor Model						
Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	11.28	1.44	0.23	1.21
Above Median	(B)	11.73	11.52	0.21	-0.06	0.27
Decile	1	12.24	10.36	1.88	0.26	1.61
Quintile	1	12.46	10.61	1.85	0.30	1.55
	2	12.69	11.34	1.35	0.21	1.14
	3	12.73	11.55	1.18	0.16	1.02
	4	13.19	12.36	0.83	0.12	0.71
Quintile	5	11.59	11.51	0.08	-0.09	0.17
Decile	10	11.44	11.43	0.01	-0.11	0.12
Long-Short Median	SMB	0.99	-0.24	1.23 ***	0.29 ***	0.94 ***
		(1.771)	(1.758)	(0.072)	(0.059)	(0.041)
Long-Short Quintiles	1-5	0.87	-0.90	1.78 ***	0.40 ***	1.38 ***
		(2.223)	(2.209)	(0.089)	(0.068)	(0.058)
Long-Short Deciles	1-10	0.80	-1.07	1.87 ***	0.37 ***	1.50 ***
		(2.343)	(2.329)	(0.099)	(0.080)	(0.060)
Three-Factor	SMB	1.33	0.19	1.15 ***	0.24 ***	0.91 ***
		(1.652)	(1.639)	(0.064)	(0.045)	(0.046)
Five-Factor	SMB	1.46	0.28	1.18 ***	0.28 ***	0.90 ***
		(1.665)	(1.653)	(0.065)	(0.049)	(0.043)

Table OA.3: **M&A Component of Size Portfolios – Placebo Tests**

This table reports two versions of placebo tests with respect to the decomposition results for size portfolios. In Panel A ('Pseudo Target and Acquirer'), M&A announcements are attributed to a random firm in each anomaly portfolio instead of to the actual targets and acquirers. Each random firm is drawn from the pool of all firms in the target's (acquirer's) specified anomaly portfolio on the target's (acquirer's) real announcement date. The target return window is then defined as -30/+1 days around announcement date for the 'pseudo target' firm, and the acquirer return window is defined as -1/+1 days around announcement date for the 'pseudo acquirer' firm. Target and Acquirer returns are adjusted using the market model for the normal return. In Panel B ('Pseudo Announcement Date'), M&A announcements are attributed to a random date for each target and acquirer in each anomaly portfolio instead of to the actual announcement dates. Each random date is drawn from the pool of all firm-dates for which the target or acquirer is allocated to the same anomaly portfolio that it is assigned to on its actual announcement date. The target return is then defined as -30/+1 days around the 'pseudo announcement date', and the acquirer return is defined as -1/+1 days around the 'pseudo announcement date.' Target and Acquirer returns are adjusted using the market model for the normal return. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Pseudo Target and Acquirer

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	12.72	0.00	0.01	-0.01
Above Median	(B)	11.73	11.77	-0.04	0.01	-0.04
Decile	1	12.24	12.21	0.03	0.01	0.02
Quintile	1	12.46	12.41	0.05	0.03	0.02
	2	12.69	12.67	0.02	0.00	0.01
	3	12.73	12.76	-0.03	0.00	-0.03
	4	13.19	13.18	0.01	0.07	-0.05
Quintile	5	11.59	11.79	-0.21	-0.01	-0.19
Decile	10	11.44	11.42	0.02	0.03	-0.01
Long-Short	SMB	0.99	0.95	0.04	0.00	0.04
Median		(1.771)	(1.748)	(0.076)	(0.053)	(0.055)
Long-Short	1-5	0.87	0.61	0.26 *	0.05	0.21 ***
Quintiles		(2.223)	(2.188)	(0.139)	(0.114)	(0.076)
Long-Short	1-10	0.80	0.79	0.01	-0.02	0.03
Deciles		(2.343)	(2.276)	(0.201)	(0.143)	(0.127)

Table OA.3 Cont.

Panel A cont.						
Three-Factor	SMB	1.33	1.39	-0.06	-0.11	0.06
		(1.652)	(1.618)	(0.099)	(0.072)	(0.061)
Five-Factor	SMB	1.46	1.47	-0.02	-0.03	0.02
		(1.665)	(1.635)	(0.061)	(0.039)	(0.039)

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Panel B: Pseudo Announcement Date						
Below Median	(S)	12.72	12.65	0.07	0.02	0.05
Above Median	(B)	11.73	11.61	0.13	0.10	0.02
Decile	1	12.24	12.14	0.09	0.03	0.07
Quintile	1	12.46	12.44	0.02	0.01	0.01
	2	12.69	12.54	0.14	0.02	0.13
	3	12.73	12.70	0.03	0.00	0.04
	4	13.19	13.11	0.09	0.04	0.05
Quintile	5	11.59	11.50	0.08	0.08	0.00
Decile	10	11.44	11.29	0.15	0.14	0.01
Long-Short Median	SMB	0.99	1.04	-0.05	-0.08	0.03
		(1.771)	(1.757)	(0.056)	(0.052)	(0.021)
Long-Short Quintiles	1-5	0.87	0.94	-0.06	-0.07	0.01
		(2.223)	(2.205)	(0.067)	(0.060)	(0.026)
Long-Short Deciles	1-10	0.80	0.85	-0.06	-0.12	0.06 *
		(2.343)	(2.326)	(0.080)	(0.072)	(0.032)
Three-Factor	SMB	1.33	1.34	0.00	-0.04	0.03 *
		(1.652)	(1.641)	(0.042)	(0.036)	(0.020)
Five-Factor	SMB	1.46	1.43	0.03	-0.02	0.05 ***
		(1.665)	(1.652)	(0.034)	(0.029)	(0.015)

Table OA.4: **M&A Component of Size Portfolios – Withdrawn Deals**

This table reports decomposition results for various size portfolios, where the merger and acquisition sample includes deals that were subsequently withdrawn. Withdrawal dates correspond to the 'Withdrawn' date field in SDC. Deals are classified as 'Withdrawn' if they are not completed, have a reported 'Withdrawn' date, and do not have a reported 'Effective' date. For withdrawn deals, target announcement returns are defined as -30/+1 days around the announcement date, and -30/+30 days around the withdrawal date. For completed deals, target announcement returns are defined as -30/+1 days around the announcement date. The acquirer returns for both completed and withdrawn deals are defined as -1/+1 days around the announcement and withdrawal dates. Target and Acquirer returns are adjusted using the market model for the normal return. The Three-Factor SMB portfolio is constructed as in Fama and French (1993). The Five-Factor SMB portfolio is constructed as in Fama and French (2015). Panel A tabulates the decompositions with respect to the M&A sample that includes only those deals that were subsequently withdrawn. Panel B tabulates the decompositions with respect to the M&A sample that includes both withdrawn and completed deals. All returns are annualized (scaling by 250 trading days per year) and expressed in percentage points. Robust standard errors are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Withdrawn Deals Only

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	12.64	0.08	-0.01	0.09
Above Median	(B)	11.73	11.69	0.05	0.00	0.04
Decile	1	12.24	12.16	0.07	0.00	0.07
Quintile	1	12.46	12.37	0.009	0.00	0.09
	2	12.69	12.62	0.07	-0.01	0.08
	3	12.73	12.66	0.07	-0.02	0.09
	4	13.19	13.08	0.11	0.00	0.11
Quintile	5	11.59	11.55	0.04	0.00	0.03
Decile	10	11.44	11.40	0.04	0.00	0.04
Long-Short	SMB	0.99	0.95	0.04	-0.01	0.05 *
Median		(1.771)	(1.765)	(0.037)	(0.025)	(0.028)
Long-Short	1-5	0.87	0.82	0.06	0.00	0.06 *
Quintiles		(2.223)	(2.214)	(0.045)	(0.030)	(0.035)
Long-Short	1-10	0.80	0.76	0.04	0.00	0.03
Deciles		(2.343)	(2.333)	(0.050)	(0.035)	(0.038)

Table OA.4 Cont.

Panel A cont.						
Three-Factor	SMB	1.33	1.34	0.00	-0.03	0.03
		(1.652)	(1.645)	(0.041)	(0.027)	(0.031)
Five-Factor	SMB	1.46	1.43	0.03	-0.02	0.05
		(1.665)	(1.659)	(0.038)	(0.024)	(0.031)

Panel B: Withdrawn and Completed Deals

Size Portfolio		Total Return	Residual	M&A	Acquirer	Target
Below Median	(S)	12.72	11.25	1.47	0.22	1.25
Above Median	(B)	11.73	11.49	0.25	-0.04	0.28
Decile	1	12.24	10.38	1.86	0.26	1.60
Quintile	1	12.46	10.61	1.85	0.29	1.56
	2	12.69	11.32	1.36	0.20	1.16
	3	12.73	11.52	1.22	0.15	1.07
	4	13.19	12.31	0.88	0.11	0.77
Quintile	5	11.59	11.47	0.11	-0.06	0.18
Decile	10	11.44	11.39	0.05	-0.07	0.13
Long-Short Median	SMB	0.99	-0.23	1.22 ***	0.26 ***	0.97 ***
		(1.771)	(1.748)	(0.084)	(0.067)	(0.050)
Long-Short Quintiles	1-5	0.87	-0.86	1.74 ***	0.35 ***	1.38 ***
		(2.223)	(2.194)	(0.105)	(0.077)	(0.070)
Long-Short Deciles	1-10	0.80	-1.01	1.80 ***	0.33 ***	1.48 ***
		(2.343)	(2.311)	(0.117)	(0.090)	(0.074)
Three-Factor	SMB	1.33	0.22	1.11 ***	0.19 ***	0.92 ***
		(1.652)	(1.631)	(0.080)	(0.055)	(0.057)
Five-Factor	SMB	1.46	0.29	1.17 ***	0.24 ***	0.93 ***
		(1.665)	(1.645)	(0.079)	(0.057)	(0.054)

Table OA.5: **M&A Component of Size Portfolios – Calendar Effects**

This table reports value-weighted daily returns for various size portfolios, as well as a decomposition of the value-weighted returns into M&A and Residual components. Long/Short size portfolios are based on median, quintile, and decile sorts. All returns are annualized (scaling by 250 trading days per year) and expressed in percentage points. In Panel A, average returns for January are reported separately from average returns for all other months. In Panel B, average returns are reported separately for each day of the week. Robust standard errors are reported in parentheses. The acquirer return is defined as +/-1 day around the announcement date. The target return is defined as -30/+1 days around the announcement date. Both target and acquirer returns are adjusted for the market return. Acquirer and target returns add to the total M&A return; the M&A return and the Residual return add to the total return. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: January Effects

Description	Portfolio	Total Return		Residual		M&A		Acquirer		Target	
		Jan	Feb–Dec	Jan	Feb–Dec	Jan	Feb–Dec	Jan	Feb–Dec	Jan	Feb–Dec
Below Median	(Small)	8.62	13.09	7.40	11.63	1.22	1.46	0.23	0.23	0.98	1.23
Above Median	(Big)	6.05	12.24	5.87	12.00	0.18	0.24	-0.22	-0.02	0.41	0.26
Decile	1	36.10	10.12	34.28	8.27	1.82	1.84	0.31	0.25	1.51	1.59
Quintile	1	20.32	11.76	18.38	9.94	1.95	1.82	0.34	0.29	1.61	1.53
	2	4.49	13.42	3.58	12.03	0.91	1.39	0.13	0.22	0.78	1.17
	3	5.11	13.41	4.02	12.22	1.10	1.19	0.31	0.15	0.79	1.05
	4	6.64	13.77	6.07	12.92	0.57	0.86	-0.03	0.13	0.61	0.73
Quintile	5	5.93	12.09	5.85	11.98	0.08	0.11	-0.27	-0.05	0.35	0.16
Decile	10	5.14	12.00	5.15	11.95	-0.01	0.05	-0.35	-0.05	0.34	0.10
Long-Short	SMB	2.57	0.85	1.53	-0.37	1.05 ***	1.22 ***	0.46 **	0.25 ***	0.58 ***	0.97 ***
Median		(5.738)	(1.859)	(5.676)	(1.842)	(0.254)	(0.077)	(0.186)	(0.064)	(0.165)	(0.042)
Long-Short	1-5	14.39 *	-0.33	12.52 *	-2.04	1.87 ***	1.71 ***	0.61 ***	0.34 ***	1.26 ***	1.37 ***
Quintiles		(7.554)	(2.325)	(7.463)	(2.304)	(0.351)	(0.094)	(0.211)	(0.073)	(0.284)	(0.059)
Long-Short	1-10	30.95 ***	-1.88	29.13 ***	-3.68	1.82 ***	1.79 ***	0.66 ***	0.30 ***	1.16 ***	1.49 ***
Deciles		(8.159)	(2.443)	(8.064)	(2.421)	(0.341)	(0.107)	(0.248)	(0.086)	(0.256)	(0.063)

Table OA.5 cont.

Panel B: Day-of-the-Week Effects

Description	Portfolio	Total Return					Residual				
		Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday
Below Median	(Small)	-8.58	17.76	16.96	15.51	20.54	-10.95	16.54	15.80	14.14	19.40
Above Median	(Big)	8.79	18.98	15.84	7.80	6.84	8.40	18.80	15.58	7.51	6.77
Long-Short	SMB	-17.37 ***	-1.23	1.13	7.71 **	13.70 ***	-19.35 ***	-2.26	0.21	6.63 *	12.63 ***
Median		(4.174)	(3.866)	(4.068)	(3.882)	(3.765)	(4.131)	(3.822)	(4.027)	(3.854)	(3.732)
Long-Short	1-5	-24.61 ***	-6.89	-0.06	10.32 **	24.36 ***	-27.04 ***	-8.47 *	-1.57	8.71 *	22.83 ***
Quintiles		(5.206)	(4.952)	(5.020)	(4.818)	(4.776)	(5.146)	(4.901)	(4.980)	(4.778)	(4.732)
Long-Short	1-10	-29.56 ***	-14.07 ***	-1.83	12.84 ***	35.28 ***	-31.86 ***	-15.79 ***	-3.31	11.08 **	33.53 ***
Deciles		(5.567)	(5.294)	(5.205)	(4.966)	(5.020)	(5.502)	(5.238)	(5.164)	(4.929)	(4.971)
Description	Portfolio	Acquirer					Target				
		Monday	Tuesday	Wednesday	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday	Friday
Below Median	(Small)	0.26	0.23	0.22	0.27	0.17	2.11	0.99	0.95	1.10	0.97
Above Median	(Big)	-0.08	-0.03	0.03	0.03	-0.13	0.48	0.21	0.23	0.26	0.20
Long-Short	SMB	0.35 **	0.26 *	0.20	0.24 *	0.30 **	1.63 ***	0.78 ***	0.72 ***	0.84 ***	0.77 ***
Median		(0.152)	(0.143)	(0.133)	(0.123)	(0.124)	(0.140)	(0.077)	(0.077)	(0.079)	(0.076)
Long-Short	1-5	0.38 **	0.41 **	0.33 **	0.27 **	0.41 ***	2.04 ***	1.17 ***	1.18 ***	1.34 ***	1.12 ***
Quintiles		(0.174)	(0.165)	(0.153)	(0.138)	(0.143)	(0.214)	(0.111)	(0.100)	(0.111)	(0.099)
Long-Short	1-10	0.43 **	0.28	0.30 *	0.16	0.48 ***	1.87 ***	1.44 ***	1.18 ***	1.60 ***	1.27 ***
Deciles		(0.215)	(0.195)	(0.179)	(0.157)	(0.165)	(0.170)	(0.149)	(0.109)	(0.142)	(0.114)

Table OA.6: **M&A Component of 45 Additional Anomaly Portfolios**

This table reports decomposition results for 45 anomaly portfolios. Long/Short portfolios are based on quintile sorts. The acquirer (target) return is defined as +/-1 (-30/+1) day around announcement date. Both target and acquirer returns are adjusted for the market return. All returns are annualized (scaling by 250 trading days per year) and expressed in percentage points. Robust standard errors are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. Details regarding the construction of each anomaly appear in Table OA.7.

Anomaly Portfolio	Total Return	Residual	M&A	Acquirer	Target	Market Cap
Accruals: L	13.92	13.57	0.35	-0.06	0.41	2.77
Accruals: S	11.03	10.31	0.72	0.17	0.55	2.70
Long-Short	2.89 **	3.26 **	-0.37 *	-0.23	-0.14 **	
	(1.455)	(1.426)	(0.193)	(0.180)	(0.068)	
Advertising Expense: L	13.74	13.22	0.52	0.05	0.47	2.56
Advertising Expense: S	12.77	12.29	0.48	0.12	0.36	3.11
Long-Short	0.96	0.93	0.04	-0.07	0.11	
	(2.341)	(2.304)	(0.246)	(0.210)	(0.122)	
Asset Growth: L	12.91	12.45	0.46	-0.06	0.52	2.35
Asset Growth: S	12.13	11.79	0.33	-0.04	0.37	3.37
Long-Short	0.78	0.66	0.12	-0.03	0.15	
	(1.898)	(1.858)	(0.202)	(0.174)	(0.101)	
Asset Turnover: L	12.10	10.75	1.35	0.17	1.18	1.73
Asset Turnover: S	11.82	11.74	0.08	-0.07	0.15	8.50
Long-Short	0.27	-1.00	1.27 ***	0.24 **	1.03 ***	
	(2.146)	(2.130)	(0.122)	(0.094)	(0.076)	
Beta Arbitrage: L	12.89	12.45	0.44	-0.01	0.45	3.26
Beta Arbitrage: S	9.73	9.50	0.22	-0.04	0.27	2.98
Long-Short	3.16	2.95	0.22	0.03	0.19 **	
	(3.726)	(3.682)	(0.170)	(0.142)	(0.092)	
Beta Square: L	12.89	12.45	0.44	-0.01	0.45	3.25
Beta Square: S	9.71	9.49	0.22	-0.05	0.27	3.01
Long-Short	3.18	2.97	0.22	0.03	0.18 **	
	(3.724)	(3.681)	(0.170)	(0.142)	(0.092)	
Bid-Ask-Spread: L	12.04	11.70	0.34	-0.03	0.36	3.53
Bid-Ask-Spread: S	11.82	11.48	0.34	0.00	0.34	2.59
Long-Short	0.22	0.23	-0.01	-0.03	0.02	
	(2.173)	(2.140)	(0.175)	(0.164)	(0.058)	
Bid-Ask-Spread (pre-2001): L	16.83	16.07	0.76	0.28	0.48	2.45
Bid-Ask-Spread (pre-2001): S	16.41	15.79	0.61	0.17	0.44	3.02
Long-Short	0.43	0.28	0.15	0.11	0.04	
	(5.225)	(5.073)	(0.269)	(0.225)	(0.141)	
Bid-Ask-Spread (post-2001): L	10.12	9.95	0.17	-0.15	0.32	3.97
Bid-Ask-Spread (post-2001): S	9.98	9.75	0.24	-0.06	0.300	2.41
Long-Short	0.14	0.20	-0.07	-0.08	0.02	
	(1.629)	(1.640)	(0.216)	(0.215)	(0.061)	
Book-to-Market: L	12.19	11.78	0.42	0.03	0.39	2.16
Book-to-Market: S	13.01	12.71	0.30	0.00	0.31	3.99
Long-Short	-0.82	-0.93	0.11	0.03	0.08	
	(2.230)	(2.189)	(0.196)	(0.119)	(0.148)	

Table OA.6 Cont.

Anomaly Portfolio	Total Return	Residual	M&A	Acquirer	Target	Market Cap
Cash Flow to Market: L	11.68	11.48	0.20	-0.16	0.36	4.17
Cash Flow to Market: S	10.91	10.72	0.19	-0.13	0.32	3.65
Long-Short	0.77	0.76	0.01	-0.03	0.04	
	(1.922)	(1.900)	(0.138)	(0.114)	(0.083)	
Cash to Assets: L	15.06	14.64	0.42	0.03	0.39	2.86
Cash to Assets: S	8.25	7.94	0.31	-0.04	0.35	3.42
Long-Short	6.81 ***	6.70 ***	0.11	0.07	0.04	
	(2.251)	(2.213)	(0.156)	(0.143)	(0.057)	
Change in Asset Turnover: L	12.72	12.18	0.55	0.15	0.39	3.28
Change in Asset Turnover: S	12.38	11.97	0.40	-0.04	0.45	2.84
Long-Short	0.35	0.20	0.14	0.20	-0.05	
	(1.528)	(1.502)	(0.194)	(0.178)	(0.077)	
Change in Equity: L	14.05	13.67	0.38	-0.07	0.46	2.47
Change in Equity: S	12.23	11.80	0.43	0.05	0.38	3.49
Long-Short	1.82	1.87	-0.05	-0.12	0.08	
	(1.837)	(1.806)	(0.190)	(0.183)	(0.055)	
Change in Financial Liabilities: L	11.40	10.85	0.55	0.01	0.54	2.96
Change in Financial Liabilities: S	10.11	9.82	0.29	-0.08	0.37	3.38
Long-Short	1.29	1.03	0.26 *	0.09	0.17 *	
	(1.221)	(1.209)	(0.151)	(0.116)	(0.087)	
Change in Long-Term Investment: L	12.27	11.81	0.47	0.08	0.39	3.28
Change in Long-Term Investment: S	11.32	11.19	0.13	-0.14	0.27	3.70
Long-Short	0.95	0.62	0.34 **	0.21	0.12 **	
	(1.091)	(1.073)	(0.160)	(0.148)	(0.059)	
Change in Net Working Capital: L	12.27	11.81	0.46	0.11	0.36	2.77
Change in Net Working Capital: S	11.59	11.02	0.57	-0.03	0.60	2.68
Long-Short	0.68	0.79	-0.11	0.14	-0.25 ***	
	(1.382)	(1.356)	(0.184)	(0.174)	(0.060)	
Change in Non Current Operating Assets: L	12.27	11.81	0.47	0.08	0.39	3.28
Change in Non Current Operating Assets: S	11.32	11.19	0.13	-0.14	0.27	3.70
Long-Short	0.95	0.62	0.34 **	0.21	0.12 **	
	(1.091)	(1.073)	(0.160)	(0.148)	(0.059)	
Failure Probability: L	12.21	11.92	0.29	-0.01	0.30	3.69
Failure Probability: S	10.12	9.65	0.47	-0.06	0.54	2.13
Long-Short	2.09	2.27	-0.18	0.05	-0.23 *	
	(3.128)	(3.075)	(0.202)	(0.153)	(0.130)	
Gross Profitability: L	11.68	11.59	0.09	-0.07	0.15	8.88
Gross Profitability: S	11.51	9.74	1.77	0.33	1.44	1.72
Long-Short	0.17	1.85	-1.68 ***	-0.39 ***	-1.29 ***	
	(2.532)	(2.507)	(0.129)	(0.103)	(0.076)	
High Frequency Combo: L	23.56	23.04	0.51	0.09	0.43	3.35
High Frequency Combo: S	7.68	7.34	0.34	0.15	0.20	3.23
Long-Short	15.87 ***	15.71 ***	0.17	-0.06	0.23 **	
	(3.847)	(3.803)	(0.548)	(0.535)	(0.115)	
Idiosyncratic Volatility: L	12.11	12.02	0.09	-0.05	0.14	6.04
Idiosyncratic Volatility: S	11.94	10.96	0.98	-0.02	1.00	1.89
Long-Short	0.17	1.06	-0.89 ***	-0.03	-0.86 ***	
	(3.541)	(3.494)	(0.205)	(0.141)	(0.146)	

Table OA.6 Cont.

Anomaly Portfolio	Total Return	Residual	M&A	Acquirer	Target	Market Cap
Industry Momentum: L	11.43	11.16	0.27	-0.12	0.39	3.32
Industry Momentum: S	10.54	10.14	0.39	0.01	0.38	3.34
Long-Short	0.90	1.02	-0.12	-0.13	0.01	
	(3.163)	(3.118)	(0.165)	(0.154)	(0.063)	
Industry Relative Reversals: L	20.39	20.06	0.33	-0.04	0.37	3.30
Industry Relative Reversals: S	4.21	3.95	0.26	0.03	0.23	3.20
Long-Short	16.18 ***	16.11 ***	0.07	-0.07	0.14 *	
	(3.757)	(3.718)	(0.451)	(0.446)	(0.075)	
Industry Relative Reversals (low vol): L	23.89	23.48	0.39	0.24	0.16	5.80
Industry Relative Reversals (low vol): S	1.18	1.39	-0.19	-0.29	0.10	5.80
Long-Short	23.57 ***	22.97 ***	0.56	0.51	0.06	
	(5.687)	(5.674)	(0.357)	(0.351)	(0.060)	
Inventory Growth: L	14.24	13.71	0.54	0.16	0.38	2.74
Inventory Growth: S	10.95	10.51	0.44	0.01	0.43	3.10
Long-Short	3.86	3.76	0.10	0.16	-0.06	
	(5.066)	(5.057)	(0.193)	(0.181)	(0.071)	
Investment Growth: L	12.91	12.45	0.46	-0.06	0.52	2.35
Investment Growth: S	12.13	11.79	0.33	-0.04	0.37	3.37
Long-Short	0.78	0.66	0.12	-0.03	0.15	
	(1.898)	(1.858)	(0.202)	(0.174)	(0.101)	
Long-Term Reversal: L	14.50	13.77	0.73	0.04	0.69	2.13
Long-Term Reversal: S	13.14	12.76	0.37	-0.01	0.38	3.87
Long-Short	1.36	1.00	0.36 **	0.05	0.31 ***	
	(2.116)	(2.091)	(0.161)	(0.143)	(0.080)	
Momentum: L	14.49	13.97	0.52	0.16	0.36	3.36
Momentum: S	8.51	7.82	0.69	-0.09	0.77	2.35
Long-Short	5.99 *	6.15 *	-0.17	0.24 *	-0.41 ***	
	(3.491)	(3.448)	(0.175)	(0.129)	(0.117)	
Momentum Reversal: L	14.45	13.87	0.58	-0.07	0.65	2.36
Momentum Reversal: S	11.70	11.28	0.42	-0.02	0.44	3.44
Long-Short	2.75	2.59	0.16	-0.05	0.21 ***	
	(2.268)	(2.236)	(0.177)	(0.160)	(0.078)	
Net Issuance: L	12.51	12.46	0.05	-0.06	0.11	8.76
Net Issuance: S	4.34	3.12	1.22	0.17	1.05	1.51
Long-Short	8.17 ***	9.34 ***	-1.17 ***	-0.22 ***	-0.94 ***	
	(1.937)	(1.919)	(0.099)	(0.087)	(0.047)	
Net Operating Assets: L	14.07	13.50	0.57	0.15	0.42	2.80
Net Operating Assets: S	9.59	9.03	0.55	0.11	0.44	3.25
Long-Short	4.28 ***	4.47 ***	0.01	0.04	-0.03	
	(1.597)	(1.572)	(0.214)	(0.201)	(0.079)	
Operating Profitability: L	13.31	13.08	0.23	-0.03	0.26	4.75
Operating Profitability: S	9.37	8.62	0.75	-0.01	0.76	2.05
Long-Short	3.95 **	4.47 **	-0.52 ***	-0.03	-0.49 ***	
	(1.987)	(1.960)	(0.160)	(0.137)	(0.080)	
PEAD (SUE): L	15.27	14.97	0.30	0.03	0.27	3.56
PEAD (SUE): S	6.31	5.93	0.38	-0.01	0.39	3.01
Long-Short	8.58 *	8.65 *	-0.08	0.04	-0.12	
	(5.057)	(5.042)	(0.147)	(0.130)	(0.080)	
Price: L	21.57	20.59	0.98	0.37	0.61	1.68
Price: S	8.05	7.89	0.16	-0.15	0.31	5.75
Long-Short	13.52 ***	12.71 ***	0.82 ***	0.52 ***	0.30 ***	
	(2.118)	(2.092)	(0.141)	(0.118)	(0.072)	

Table OA.6 Cont.

Anomaly Portfolio	Total Return	Residual	M&A	Acquirer	Target	Market Cap
Return on Book Equity: L	14.36	14.06	0.30	0.11	0.19	4.54
Return on Book Equity: S	4.27	3.57	0.70	-0.09	0.79	2.14
Long-Short	10.09 ***	10.49 ***	-0.40 **	0.20	-0.60 ***	
	(2.324)	(2.285)	(0.180)	(0.125)	(0.126)	
Sales-to-Price: L	13.63	13.23	0.41	-0.09	0.50	2.18
Sales-to-Price: S	12.08	11.74	0.34	0.01	0.33	3.50
Long-Short	1.55	1.49	0.07	-0.10	0.17 **	
	(2.066)	(2.037)	(0.143)	(0.120)	(0.077)	
Seasonality: L	19.30	18.85	0.45	0.04	0.40	3.28
Seasonality: S	3.95	3.31	0.64	0.21	0.42	2.71
Long-Short	15.35 ***	15.54 ***	-0.19	-0.17	-0.02	
	(1.938)	(1.914)	(0.176)	(0.162)	(0.068)	
Short-Term Reversal: L	12.63	12.09	0.54	0.07	0.47	2.70
Short-Term Reversal: S	10.12	9.55	0.57	-0.01	0.57	3.00
Long-Short	2.51	2.54	-0.03	0.08	-0.10	
	(3.005)	(2.968)	(0.172)	(0.149)	(0.088)	
Sustainable Growth: L	13.56	13.21	0.35	-0.10	0.45	2.50
Sustainable Growth: S	11.24	10.84	0.39	-0.03	0.43	3.55
Long-Short	2.33	2.37	-0.04	-0.07	0.03	
	(1.735)	(1.709)	(0.181)	(0.170)	(0.068)	
Turnover Volatility: L	14.14	14.08	0.06	0.01	0.05	3.68
Turnover Volatility: S	7.00	6.21	0.79	0.01	0.78	2.68
Long-Short	7.66	8.40 *	-0.73 ***	0.01	-0.74 ***	
	(5.083)	(5.078)	(0.134)	(0.115)	(0.068)	
Value-Momentum: L	13.23	12.70	0.53	0.14	0.40	2.64
Value-Momentum: S	9.60	9.14	0.47	-0.16	0.62	3.18
Long-Short	3.62	3.56	0.07	0.29 **	-0.23 ***	
	(2.323)	(2.304)	(0.144)	(0.119)	(0.080)	
Value-Momentum-Profitability: L	12.74	12.50	0.23	0.02	0.22	5.07
Value-Momentum-Profitability: S	5.30	3.73	1.57	0.11	1.46	2.12
Long-Short	7.44 ***	8.78 ***	-1.33 ***	-0.09	-1.24 ***	
	(2.839)	(2.813)	(0.161)	(0.117)	(0.109)	
Value-Profitability: L	11.16	10.95	0.21	-0.04	0.25	5.76
Value-Profitability: S	10.81	9.21	1.60	0.30	1.30	2.34
Long-Short	0.35	1.74	-1.38 ***	-0.33 ***	-1.05 ***	
	(3.311)	(3.271)	(0.151)	(0.120)	(0.088)	
Volume Variance: L	12.50	11.76	0.74	0.12	0.62	1.70
Volume Variance: S	11.65	11.55	0.11	-0.06	0.16	6.84
Long-Short	0.84	0.21	0.63 ***	0.18 **	0.46 ***	
	(2.036)	(2.017)	(0.092)	(0.081)	(0.042)	

Table OA.7: **Anomaly Definitions**

This table reports details regarding the construction of all anomaly portfolios considered in Table OA.6. Panel A describes the anomalies that are rebalanced annually at the end of June. Panel B describes the anomalies that are rebalanced monthly.

Panel A: Anomaly Portfolios Re-balanced Annually

Anomaly	Description	Citation
Accruals	At the end of June of each year *t*, firms are sorted on the annual change in total current assets minus the annual change in total cash and short-term investments minus the annual change in current liabilities plus the annual change in debt in current liabilities plus the annual change in income taxes payable minus the annual change in depreciation and amortization, divided by the average of total assets from years *t-1* and *t-2*	Sloan (1996)
Advertising Expense	At the end of June of each year *t*, firms are sorted on advertising expense from *t-1* divided by market equity as of the end of Dec in year *t-1*	Chan et al. (2001)
Asset Growth	At the end of June of each year *t*, firms are sorted on total assets from year *t-1*, divided by total assets from year *t-2*	Cooper et al. (2008)
Asset Turnover	At the end of June of each year *t*, firms are sorted on sales from *t-1* divided by the average of Net Operating Assets from year *t-1* and *t-2*; Net Operating Assets defined below	Soliman (2008)
Book-to-Market	At the end of June of each year *t*, firms are sorted on book equity from *t-1* divided by market equity at the end of Dec in year *t-1*	Fama and French (1993)
Cash Flow to Market	At the end of June of each year *t*, firms are sorted on net income plus depreciation, divided by market equity at the end of Dec in year *t-1*	Lakonishok et al. (1994)
Change in Asset Turnover	Annual change in Asset Turnover (defined above)	Soliman (2008)
Change in Equity	At the end of June of each year *t*, firms are sorted on the difference between book equity in year *t-1* and year *t-2*, scaled by average total assets in years *t-1* and *t-2*	Richardson et al. (2005)
Change in Financial Liabilities	At the end of June of each year *t*, firms are sorted on the difference between financial liabilities in year *t-1* and *t-2*; financial liabilities is the sum of long-term debt, current liabilities, and preferred stock	Richardson et al. (2005)
Change in Long-Term Investment	At the end of June of each year *t*, firms are sorted on the difference in investment and advances between years *t-1* and *t-2*, scaled by average total assets in years *t-1* and *t-2*	Richardson et al. (2005)
Change in Net Working Capital	At the end of June of each year *t*, firms are sorted on the difference between net working capital in year *t-1* and *t-2*	Soliman (2008)
Change in Non-current Operating Assets	At the end of June of each year *t*, firms are sorted on the difference between non-current operating assets in year *t-1* and *t-2*	Soliman (2008)
Gross Profitability	At the end of June of each year *t*, firms are sorted on revenues minus COGS, divided by total assets all from year *t-1*	Novy-Marx (2013)
Inventory Growth	At the end of June of each year *t*, firms are sorted on the difference between inventory in year *t-1* and *t-2*, scaled by average total assets in years *t-1* and *t-2*	Thomas and Zhang (2002)

Table OA.7 Cont.

Anomaly	Description	Citation
Investment Growth	At the end of June of each year *t*, firms are sorted on the difference in total in total assets from year *t-2* to year *t-1*, divided by total assets in year *t-1*	Fama and French (2015)
Net Operating Assets	At the end of June of each year *t*, firms are sorted on the sum of short-term debt, long-term debt, minority interest, preferred stock, and common and equity minus cash and short-term investment (all from year *t-1*), divided by total assets from year *t-2*	Hirshleifer et al. (2004)
Operating Profitability	At the end of June of each year *t*, firms are sorted on revenues minus COGS, interest expense, and SGA expense, divided by book equity all from year *t-1*	Fama and French (2015)
Sales-to-Price	At the end of June of each year *t*, firms are sorted on annual sales from year *t-1* divided by market value of equity at the end of June in year *t*	Barbee et al. (1996)
Sustainable Growth	At the end of June of each year *t*, firms are sorted on the ratio of book equity in year *t-1* to book equity in year *t-2*; include only if book equity is positive in both years	Lockwood and Prombutr (2010)
Value-Profitability	Firms are sorted based on the sum of their ranks in univariate decile sorts on book-to-market and gross profitability	Novy-Marx (2014)

Panel B: Anomaly Portfolios Re-balanced Monthly

Anomaly	Description	Citation
Beta Arbitrage	In each month *j*, firms are sorted on their prior 60-month market beta	Black (1972)
Beta Square	Square of Beta Arbitrage (defined above)	Fama and MacBeth (1973)
Bid-Ask-Spread	In each month *j*, firms are sorted on their bid-ask spread	Amihud and Mendelson (1986)
Cash to Assets	In each month *j*, firms are sorted on the ratio of cash and short-term investments to total assets, all from month *j-1*	Palazzo (2012)
Failure Probability	In each month *j*, firms are sorted on $FP = -9.164 - 20.264 \times NIMTAAVG + 1.416 \times TLMTA - 7.129 \times EXRETAVG + 1.411 \times SIGMA - 0.045 \times RSIZE - 2.132 \times CASHMTA + 0.075 \times MB - 0.058 \times PRICE$; where $NIMTAAVG = (\frac{1-\phi^3}{1+\phi^{12}})(NIMTA_{-1,-3} + ... + \phi^9 NIMTA_{-10,-12})$, $EXRETAVG = (\frac{1-\phi^3}{1+\phi^{12}})(EXRET_{-1} + ... + \phi^{11} EXRET_{-12})$, NIMTA is net income (updated quarterly) divided by the sum of market equity and total liabilities (updated quarterly), $EXRET = log(\frac{1+r_{ij}}{1+r_{S\&P500_{ij}}})$, $\phi = 2^{-\frac{1}{3}}$, TLMTA is the ratio of total liabilities (updated quarterly) scaled by the sum of market equity and total liabilities, $SIGMA = \sqrt{\frac{252}{N-1}\sum_{k\in j-1,j-2,j-3} r_k^2}$ in which r_k^2 is the firm's daily return and N is the number of trading days in the three-month period, RSIZE is the relative size of each firm measured as the log of its market equity to that of the S&P 500, CASHMTA is the ratio of cash and short-term investments (updated quarterly) to the sum of market equity and total liabilities, MB is the market-to-book ratio, and PRICE is each firm's log price per share, truncated above at $15; all using market equity from month *j-1*	Campbell et al. (2008)
High-Frequency Combo	In each month *j*, firms are sorted on the sum of their ranks in univariate decile sorts on industry relative reversals and industry momentum	Novy-Marx and Velikov (2015)

Table OA.7 Cont.

Idiosyncratic Volatility	In each month *j*, firms are sorted on the standard deviation of the residuals of regressions of their daily returns from months *j-3* to *j-1* on the daily returns of the Fama and French (1993) three factors	Ang et al. (2006)
Industry Momentum	In each month *j*, firms are sorted on their industry's value weighted return from month *j-1* using the Fama and French 49 industries; the five loser industries make up decile 1 and the five winner industries make up decile 10	Moskowitz and Grinblatt (1999)
Industry Relative Reversals	In each month *j*, firms are sorted on the difference between their return in month *j-1* and their industry's value weighted return in month *j-1* using the Fama and French 49 industries	Da et al. (2014)
Industry Relative Reversals (low vol)	In each month *j*, firms are sorted on Industry Relative Reversals (defined above); exclude all stocks with above NYSE$_{m}edianidiosyncraticvolatility$	Novy-Marx and Velikov (2015)
Long-Run Reversal	In each month *j*, firms are sorted on their commutative return from months *j-36* to *j-13*	De Bondt and Thaler (1985)
Momentum	In each month *j*, firms are sorted on their cumulative return from months *j-12* to *j-2*	Jegadeesh and Titman (1993)
Moment Reversal	In each month *j*, firms are sorted on their cumulative return from months *j-18* to *j-13*	De Bondt and Thaler (1985)
Net Issuance	In each month *j*, firms are sorted on the year-over-year change in adjusted shares outstanding, AJEXQ × CSHOQ, where AJEXQ is the quarterly split adjustment factor and CSHOQ is common shares outstanding	Chen et al. (2010)
PEAD (SUE)	In each month *j*, firms are sorted on earnings surprises measured by standardized unexpected earnings (SUE) in each month *j* or year *t* $SUE = \frac{IBQ_t - IBQ_{t-1}}{\sigma_{IBQ_{j-24}:IBQ_{j-3}}}$, where IBQ is income before extraordinary items and $\sigma_{IBQ_{j-24}:IBQ_{j-3}}$ is the standard deviation of IBQ in the past two years skipping the most recent quarter	Foster et al. (1984)
Price	In each month *j*, firms are sorted on the log of the absolute value of their price at the end of month *j-1*	Blume and Husic (1973)
Return on Book Equity	In each month *j*, firms are sorted on income before extraordinary items (updated quarterly) divided by book value of equity from month *j-3*	Chen et al. (2010)
Seasonality	In each month *j* in year *t*, firms are sorted on their average returns in the calendar month *j+1* from years *t-5* to *t-1*	Heston and Sadka (2011)
Short-Term Reversal	In each month *j*, firms are sorted on their return in month *j-1*	Jegadeesh and Titman (1993)
Turnover Volatility	In each month *j*, firms are sorted on the standard deviation of their turnover from the past 36 months	Chordia et al. (2001)
Value-Momentum	Firms are sorted based on the sum of their ranks in univariate decile sorts on book-to-market and momentum	Novy-Marx (2014)
Value-Momentum-Profitability	Firms are sorted based on the sum of their ranks in univariate decile sorts on book-to-market, momentum, and gross profitability	Novy-Marx (2014)
Volume Variance	In each month *j*, firms are sorted on the standard deviation of trading volume from the past 36 months	Chordia et al. (2001)

Table OA.8: **Fama MacBeth Regressions and Takeover Likelihood**

This table presents Fama MacBeth regressions of annual returns on takeover likelihood and other firm characteristics. Time series average coefficient estimates are reported with Newey-West corrected t-statistics in parentheses. Takeover likelihood is calculated using the coefficients estimated in Model 4 in Table 8 in the main paper and the SDC sample period. ln(MktCap), Q, PPE, ln(Cash), BLOCK, Industry, Leverage, ROA, Dividend, LRET, and Idiosyncratic volatility are defined as in Table 8 in the main paper. Controls include: book-to-market, investment growth, short-term reversal, momentum, and turnover; all are defined as in Table 9 in the main paper. All Compustat data is measured as of the end of the prior calendar year. All market return data is measured as of the end of June, and is used to estimate the annual return from July through June of the following year. All continuous explanatory variables are winsorized at the 1% and 99% levels. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Takeover Likelihood	2.9743 ***	3.1594 ***	3.5781 ***	2.4716 **	3.5562 **	3.2078 ***	2.6093 ***	3.2046 ***
	(2.999)	(3.344)	(3.177)	(2.160)	(1.957)	(2.932)	(2.887)	(3.378)
ln(MktCap)	0.0121 ***	0.0122 ***	0.0131 ***	0.0109 ***	0.0124 ***	0.0120 ***	0.0139 ***	0.0122 ***
	(3.131)	(3.147)	(3.361)	(2.951)	(2.676)	(3.055)	(3.547)	(3.216)
Q	-0.0099 ***							
	(-2.709)							
PPE		0.0165						
		(1.437)						
ln(Cash)			0.0059					
			(1.472)					
BLOCK				0.0153				
				(1.210)				
Industry (BDH)					-0.0012			
					(-0.053)			
Leverage						-0.0051		
						(-0.164)		
ROA	0.0499 **	0.0589 ***	0.0596 ***	0.0590 ***	0.0590 ***	0.0575 ***	0.0519 **	0.0606 ***
	(2.174)	(2.710)	(2.739)	(2.730)	(2.714)	(2.632)	(2.425)	(2.815)
Dividend							-0.0346 ***	
							(-2.998)	
LRET								0.1449 **
								(2.313)
Idiosyncratic Volatility	3.1831 ***	3.2183 ***	3.2793 ***	3.2679 ***	3.2730 ***	3.2132 ***	2.9899 ***	3.2428 ***
	(4.690)	(4.666)	(4.680)	(4.726)	(4.746)	(4.563)	(4.633)	(4.715)
Controls	×	×	×	×	×	×	×	×

Table OA.9: **Takeover Probability-Sorted Portfolio Alphas**

This table reports monthly returns and Fama and French (2015) five-factor α's, both expressed in percentage points, for portfolios sorted on takeover probability. Column headings indicate the model from Table 8 in the main paper and the sample period used to estimate takeover likelihood. Model 2 uses the estimated coefficients from Model 2 to calculate takeover likelihood. Model 4 (SDC Sample) uses the estimated coefficients from Model 4 to calculate takeover likelihood. Model 4 (Rolling Window) uses the dependent variables in Model 4 and the 10-year rolling estimation window. Model 5 (SDC Sample) uses the estimated coefficients from Model 5 to calculate takeover likelihood. Banks are excluded from the sample when estimating the coefficients in Model 5. They are included in the sample when estimating returns and α's in this table. Robust standard errors are reported in parentheses. 10-1 (5-1) rows report the return or alpha and corresponding standard error of an equally weighted portfolio that buys firms in the highest takeover probability decile (quintile) and sells firms in the lowest takeover probability decile (quintile). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Takeover Probability Quintile	Model 2 (CNJ) SDC Sample (1990–2020) Raw Return	Model 2 (CNJ) SDC Sample (1990–2020) Alpha	Model 4 SDC Sample (1990–2020) Raw Return	Model 4 SDC Sample (1990–2020) Alpha	Model 4 Rolling Window (1986–2020) Raw Return	Model 4 Rolling Window (1986–2020) Alpha	Model 5 (Exclude Banks) SDC Sample (1990–2020) Raw Return	Model 5 (Exclude Banks) SDC Sample (1990–2020) Alpha
1	0.9570 ***	-0.0200	0.9824 ***	-0.0390	0.8362 ***	-0.1205	0.8745 ***	-0.0705
	(0.281)	(0.103)	(0.309)	(0.122)	(0.302)	(0.126)	(0.262)	(0.101)
2	1.0917 ***	0.1577	1.1290 ***	0.1934	1.1311 ***	0.1379	1.1839 ***	0.1853 *
	(0.289)	(0.127)	(0.304)	(0.129)	(0.287)	(0.110)	(0.291)	(0.111)
3	1.3124 ***	0.2656 ***	1.2887 ***	0.2979 **	1.2879 ***	0.3141 ***	1.3322 ***	0.3393 ***
	(0.306)	(0.093)	(0.298)	(0.116)	(0.280)	(0.086)	(0.299)	(0.111)
4	1.4316 ***	0.3253 ***	1.4786 ***	0.3920 ***	1.3292 ***	0.3643 ***	1.3698 ***	0.3357 ***
	(0.330)	(0.119)	(0.321)	(0.103)	(0.281)	(0.103)	(0.314)	(0.118)
5	1.5776 ***	0.5914 ***	1.4758 ***	0.4626 ***	1.3215 ***	0.3802 **	1.6085 ***	0.5235 ***
	(0.333)	(0.181)	(0.302)	(0.149)	(0.297)	(0.155)	(0.366)	(0.170)
5-1	0.6207 ***	0.6114 ***	0.4934 ***	0.5015 ***	0.4852 ***	0.5007 ***	0.7340 ***	0.5940 ***
	(0.139)	(0.130)	(0.122)	(0.113)	(0.119)	(0.114)	(0.153)	(0.122)
10-1	0.5853 ***	0.6049 ***	0.5903 ***	0.6134 ***	0.6364 ***	0.6276 ***	1.0591 ***	0.8881 ***
	(0.192)	(0.187)	(0.155)	(0.141)	(0.149)	(0.140)	(0.196)	(0.175)

Table OA.10: **Excluded Factor Regressions – TMA Betas**

This table reports excluded monthly factor regression alphas and betas for a variety of factor models. Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the takeover probability factor and the independent variables are the factors that correspond to the factor model in the row labels. In Panel A, takeover likelihood is calculated using the coefficients from Model 4 in Table 8 in the main paper. In Panel B, takeover likelihood is calculated using a backward-extended version of Model 4 that includes data from 1963–2020. In Panel C, takeover likelihood is calculated using the dependent variables from Model 4 in Table 8 in the main paper and the 10-year rolling estimation window. The TMA is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: SDC Sample (1990–2020)			Panel B: Extended Sample (1963–2020)			Panel C: Rolling Window (1986–2020)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
α	0.5958 ***	0.5099 ***	0.5489 ***	0.4959 ***	0.4157 ***	0.4199 ***	0.5254 ***	0.4901 ***	0.5755 ***
	(5.147)	(4.350)	(4.659)	(4.700)	(3.790)	(3.630)	(4.000)	(3.849)	(4.495)
MKT	-0.2053 ***	-0.1736 ***	-0.1987 ***	-0.1790 ***	-0.1648 ***	-0.1672 ***	-0.0900 **	-0.0887 **	-0.1406 ***
	(-5.278)	(-4.675)	(-5.120)	(-6.288)	(-5.844)	(-5.044)	(-2.143)	(-2.132)	(-3.488)
SMB	0.2369 ***	0.2865 ***	0.2756 ***	0.6156 ***	0.6789 ***	0.6772 ***	0.0816 *	0.1503 **	0.1234 **
	(7.056)	(6.373)	(5.955)	(9.856)	(11.169)	(10.713)	(1.665)	(2.513)	(2.046)
HML	0.2282 ***	0.1541 **	0.1327 *	0.3258 ***	0.3002 ***	0.2978 ***	0.0815	0.1068	0.0635
	(3.356)	(1.996)	(1.732)	(5.537)	(4.731)	(4.515)	(1.121)	(1.325)	(0.815)
CMA		0.0938	0.0974		0.0515	0.0528		-0.1421	-0.1394
		(0.881)	(0.924)		(0.543)	(0.566)		(-1.237)	(-1.247)
RMW		0.1533 **	0.2267 ***		0.2427 ***	0.2503 ***		0.1903 **	0.3463 ***
		(2.366)	(2.903)		(3.763)	(3.035)		(2.296)	(3.213)
UMD	-0.0055	-0.0147	-0.0037	-0.0619	-0.0741 *	-0.0731 *	0.0249	0.0221	0.0470
	(-0.150)	(-0.436)	(-0.107)	(-1.404)	(-1.822)	(-1.765)	(0.509)	(0.494)	(1.025)
QMJ			-0.1196			-0.0132			-0.2576 ***
			(-1.421)			(-0.145)			(-2.748)
Adj-R^2	0.253	0.267	0.270	0.373	0.392	0.391	0.036	0.066	0.082

Table OA.11: **Excluded Factor Regressions – SMB Betas**

This table reports excluded monthly factor regression alphas and betas for a variety of factor models. Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the SMB factor and the independent variables are the factors that correspond to the factor model in the row labels. MKT is the value-weighted market return. FF 3 corresponds to the Fama French three-factor model (Fama and French (1993)). UMD is the Carhart (1997) momentum factor. FF 5 corresponds to the Fama French five-factor model (Fama and French (2015)). QMJ is the 'quality minus junk' factor of Asness et al. (2019). In Panel A, takeover likelihood is calculated using a backward-extended version of Model 4 that includes data from 1963–2020. In Panel B, takeover likelihood is calculated using the backward-extended version of Model 4 that includes data prior to the start of our SDC sample period (1963–1989). In Panel C, takeover likelihood is calculated using the coefficients from Model 4 in Table 8 in the main paper. In Panel D, takeover likelihood is calculated using the dependent variables from Model 4 in Table 8 in the main paper and the 10-year rolling estimation window. The TMA is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. The TMA is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Extended Sample (1963–2020)		Panel B: Pre-SDC Sample (1963–1989)		Panel C: SDC Sample (1990–2020)		Panel D: Rolling Window (1986–2020)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
α	-0.0237	0.1075	-0.0020	0.1748 *	0.0095	0.1054	0.0904	0.2297
	(-0.259)	(1.141)	(-0.018)	(1.675)	(0.066)	(0.685)	(0.643)	(1.556)
MKT	0.1700 ***	0.0872 ***	0.1643 ***	0.0757 **	0.1320 ***	0.0696	0.0786 **	-0.0047
	(7.038)	(2.963)	(5.670)	(2.466)	(3.234)	(1.377)	(2.017)	(-0.100)
TMA	0.5057 ***	0.4782 ***	0.5455 ***	0.4978 ***	0.4497 ***	0.4263 ***	0.1890 **	0.1526 **
	(18.596)	(17.420)	(22.818)	(21.703)	(6.118)	(5.629)	(2.467)	(1.976)
HML	-0.1756 ***	-0.2403 ***	-0.1834 ***	-0.2632 ***	-0.0838	-0.1286 *	-0.0681	-0.1274 *
	(-3.149)	(-4.275)	(-3.014)	(-4.429)	(-1.109)	(-1.722)	(-1.003)	(-1.886)
CMA	-0.1157	-0.0710	-0.1740 *	-0.0635	-0.0248	-0.0147	0.0351	0.0338
	(-1.475)	(-0.958)	(-1.905)	(-0.749)	(-0.213)	(-0.130)	(0.343)	(0.333)
RMW	-0.4536 ***	-0.1974 *	-0.1971 ***	0.1505	-0.6105 ***	-0.4284 ***	-0.6189 ***	-0.3569 **
	(-5.223)	(-1.784)	(-2.751)	(1.586)	(-5.667)	(-3.079)	(-5.279)	(-2.340)
UMD	0.0502	0.0754 **	0.0776 *	0.0728 *	0.0426	0.0665	0.0268	0.0638
	(1.430)	(2.231)	(1.892)	(1.843)	(0.920)	(1.455)	(0.595)	(1.453)
QMJ		-0.4013 ***		-0.5437 ***		-0.2727 **		-0.3866 ***
		(-5.101)		(-5.547)		(-2.517)		(-3.390)
Adj-R^2	0.484	0.510	0.680	0.720	0.376	0.387	0.289	0.313

Table OA.12: **Size Portfolio Betas**

This table reports monthly alphas and betas from regressions of size decile portfolio returns on the FF5 - SMB + TMA + UMD + QMJ factor model. Units are expressed in percentage points and robust t-statistics are reported in parentheses. D1 corresponds to the smallest size decile. D10 corresponds to the largest size decile. The sample period extends from 1963–2020, and takeover likelihood is calculated using a backward-extended version of Model 4 that includes data from 1963–2020. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	α	MKT	TMA	HML	CMA	RMW	UMD	QMJ	R^2
D1	0.4074 ***	0.9768 ***	0.7877 ***	-0.1310 **	-0.0110	-0.2037	0.1202 **	-0.6951 ***	0.858
(Small)	(3.181)	(27.476)	(23.987)	(-2.063)	(-0.119)	(-1.585)	(2.512)	(-7.305)	
D2	0.4285 ***	1.0935 ***	0.5170 ***	-0.0144	-0.1240	-0.2380 *	0.0944 **	-0.5120 ***	0.844
	(3.661)	(32.024)	(14.815)	(-0.207)	(-1.459)	(-1.868)	(2.212)	(-5.385)	
D3	0.4823 ***	1.1104 ***	0.4273 ***	0.0185	-0.0955	-0.1506	0.0498 *	-0.4037 ***	0.866
	(4.975)	(37.161)	(15.076)	(0.320)	(-1.278)	(-1.593)	(1.694)	(-5.154)	
D4	0.4617 ***	1.0853 ***	0.3368 ***	0.0404	-0.1424 *	-0.0574	0.0665 **	-0.3981 ***	0.863
	(4.983)	(37.192)	(11.870)	(0.724)	(-1.907)	(-0.582)	(2.290)	(-5.180)	
D5	0.5543 ***	1.0742 ***	0.2434 ***	0.0445	-0.1008	-0.0669	0.0387	-0.3648 ***	0.883
	(6.719)	(41.791)	(9.449)	(0.885)	(-1.476)	(-0.737)	(1.406)	(-5.350)	
D6	0.5070 ***	1.0391 ***	0.1756 ***	0.0626	-0.0995 *	0.0394	0.0300	-0.3365 ***	0.903
	(6.931)	(49.137)	(9.098)	(1.547)	(-1.780)	(0.640)	(1.497)	(-5.923)	
D7	0.4829 ***	1.0675 ***	0.1270 ***	0.0310	0.0019	0.0468	0.0388 *	-0.2807 ***	0.922
	(7.316)	(53.624)	(5.993)	(0.727)	(0.031)	(0.586)	(1.773)	(-5.342)	
D8	0.5596 ***	1.0259 ***	0.0190	0.0352	0.0328	-0.0459	0.0147	-0.2460 ***	0.938
	(10.308)	(67.887)	(1.098)	(1.172)	(0.673)	(-0.702)	(0.761)	(-5.779)	
D9	0.4845 ***	0.9766 ***	-0.0295 **	0.0645 **	0.0379	0.0816 *	0.0020	-0.1867 ***	0.951
	(10.683)	(83.087)	(-2.140)	(2.272)	(0.926)	(1.700)	(0.124)	(-5.419)	
D10	0.3265 ***	0.9725 ***	-0.1095 ***	0.0318	0.0102	0.0114	-0.0232 *	0.2046 ***	0.966
(Big)	(9.248)	(93.484)	(-10.922)	(1.620)	(0.346)	(0.316)	(-1.895)	(7.165)	

Table OA.13: **Takeover Probability Model – Alternative Size Measures**

This table reports MLE estimates of a logistic regression model for takeover probability. The dependent variable is equal to one if an acquisition occurs in that calendar year and zero otherwise. ln(Book Assets) is defined as the natural log of total book assets. ln(Sales) is defined as the natural log of sales. All other dependent variables are calculated as in Table 8 in the main paper. All Compustat variables other than ln(Book Assets) and ln(Sales) are industry-adjusted (mean) using the Fama French 48 industries. All continuous variables are winsorized at the 1% and 99% levels. Coefficients are reported with standard errors in parentheses and odds ratios in brackets. Odds ratios are estimated as $\exp(\beta_i)$ for dummy variables and $\exp(\beta_i * \sigma_i)$ for continuous variables, where β_i denotes the estimated coefficient of independent variable i and σ_i denotes the standard deviation of independent variable i. Standard errors are clustered by firm. The sample period extends from January 1990 through December 2020. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Model 6: Excluding Size (1)	Model 7: Book Assets (2)	Model 8: Sales (3)	Model 9: MktCap + Assets - Q (4)
Intercept	-4.3296 ***	-4.3467 ***	-4.1851 ***	-2.4943 ***
	(0.119)	(0.126)	(0.123)	(0.162)
ln(MktCap)				-0.2469 ***
				(0.014)
				[0.578]
ln(Book Assets)		0.0091		0.2045 ***
		(0.009)		(0.014)
		[1.021]		[1.586]
ln(Sales)			-0.0275 ***	
			(0.008)	
			[0.938]	
Q	-0.0041 **	-0.0033 *	-0.0039 **	
	(0.002)	(0.002)	(0.002)	
	[0.981]	[0.985]	[0.982]	
PPE	-0.0212	-0.0337	-0.0361	-0.0262
	(0.055)	(0.055)	(0.055)	(0.056)
	[0.994]	[0.991]	[0.990]	[0.993]

Table OA.13 Cont.

	Model 6: Excluding Size (1)	Model 7: Book Assets (2)	Model 8: Sales (3)	Model 9: MktCap + Assets - Q (4)
ln(Cash)	-0.0168	-0.0157	-0.0201	0.0082
	(0.012)	(0.012)	(0.012)	(0.012)
	[0.978]	[0.980]	[0.974]	[1.011]
BLOCK	0.2709 ***	0.2544 ***	0.2895 ***	0.3199 ***
	(0.034)	(0.035)	(0.036)	(0.035)
	[1.311]	[1.290]	[1.336]	[1.377]
Industry (BDH)	0.4853 ***	0.4884 ***	0.4747 ***	0.4705 ***
	(0.043)	(0.043)	(0.043)	(0.043)
	[1.625]	[1.630]	[1.608]	[1.601]
Leverage	0.2852 ***	0.2444 ***	0.3063 ***	0.0653
	(0.078)	(0.081)	(0.079)	(0.083)
	[1.057]	[1.049]	[1.062]	[1.013]
ROA	-0.0488	-0.1064 *	-0.0441	-0.0349
	(0.060)	(0.063)	(0.065)	(0.074)
	[0.988]	[0.975]	[0.990]	[0.992]
Dividend	-0.0916 ***	-0.1140 ***	-0.0766 **	-0.2091 ***
	(0.032)	(0.034)	(0.033)	(0.035)
	[0.912]	[0.892]	[0.926]	[0.811]
LRET	-0.1351 ***	-0.1371 ***	-0.1336 ***	-0.0174
	(0.026)	(0.027)	(0.027)	(0.026)
	[0.910]	[0.909]	[0.911]	[0.988]
Idiosyncratic Volatility	-1.3323 *	-1.0277	-1.9684 ***	-2.9879 ***
	(0.715)	(0.779)	(0.752)	(0.773)
	[0.968]	[0.976]	[0.954]	[0.931]
Year Fixed Effects	Y	Y	Y	Y
Pseudo R^2	1.953%	1.946%	1.971%	2.673%
Observations	138,229			
Targets	4,925			

Table OA.14: **Excluded Factor Regressions – TMA – Alternative Takeover Likelihood Models**

This table reports excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the takeover probability factor and the independent variables are the factors that correspond to the factor model in the row labels. FF3 corresponds to the Fama French three-factor model (Fama and French (1993)). FF5 corresponds to the Fama French five-factor model (Fama and French (2015)). UMD is the Carhart (1997) momentum factor. BAB is the 'betting against beta' factor of Frazzini and Pedersen (2014). QMJ is the 'quality minus junk' factor of Asness et al. (2019). StY 4 corresponds to the four-factor model from Stambaugh and Yuan (2017). LP 5 corresponds to the five-factor RP-PCA model from Lettau and Pelger (2020). KNS 5 corresponds to the five-factor PCA model from Kozak et al. (2020). In Panel A, takeover likelihood is calculated using the coefficients from Model 2 and the SDC sample period (1990–2020). In Panel B, takeover likelihood is calculated using the coefficients from Model 5 and the SDC sample period. Banks are excluded from the estimation sample in Model 5, but are included in the sample in this table. In Panels C, D, E, and F takeover likelihood is calculated using the coefficients from Models 6, 7, 8, and 9, respectively, in Table OA.13 and the SDC sample period (1990–2020). The TMA is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. α columns report the intercepts from the excluded factor regressions. $Sh^2(f)$ columns report the maximum squared Sharpe ratio from the tangency portfolio that includes the factors in the row labels (i.e., only the RHS factors). $\alpha^2/s^2(e)$ columns report the corresponding TMA factor's marginal contribution to $Sh^2(f)$, as in Fama and French (2018). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Model 2 (CNJ)			Panel B: Model 5 (Exclude Banks)			Panel C: Model 6 (Excluding Size)		
	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$
MKT	0.6365 ***	0.0277	0.0572	0.5473 ***	0.0277	0.0407	0.1807	0.0277	0.0068
	(4.222)			(3.693)			(1.503)		
FF3	0.6027 ***	0.0295	0.0688	0.5329 ***	0.0295	0.0578	0.1671	0.0295	0.0062
	(4.968)			(4.572)			(1.472)		
FF3 + UMD	0.6512 ***	0.0591	0.0814	0.6583 ***	0.0591	0.0986	0.3035 ***	0.0591	0.0237
	(5.110)			(5.632)			(2.812)		
FF 5	0.6114 ***	0.1196	0.0706	0.5940 ***	0.1196	0.0729	0.1646	0.1196	0.0060
	(4.677)			(4.847)			(1.566)		
FF 5 + UMD	0.6487 ***	0.1366	0.0806	0.6879 ***	0.1366	0.1094	0.2698 ***	0.1366	0.0187
	(4.800)			(5.770)			(2.627)		
FF 5 + UMD + BAB	0.5157 ***	0.1588	0.0601	0.6394 ***	0.1588	0.0966	0.2755 ***	0.1588	0.0195
	(4.179)			(5.450)			(2.565)		
FF 5 + UMD + QMJ	0.8075 ***	0.1990	0.1351	0.7844 ***	0.1990	0.1470	0.2580 **	0.1990	0.0171
	(6.216)			(6.531)			(2.482)		
StY 4	0.7438 ***	0.1964	0.1023	0.7040 ***	0.1964	0.1008	0.2371 *	0.1964	0.0124
	(4.656)			(4.458)			(1.736)		
LP 5	0.6067 ***	0.1935	0.0854	0.6650 ***	0.1935	0.1302	0.2713 **	0.1935	0.0191
	(4.498)			(5.377)			(2.356)		
KNS 5	0.5085 ***	0.0959	0.0499	0.5715 ***	0.0959	0.0775	0.1690	0.0959	0.0069
	(3.669)			(4.471)			(1.496)		

Table OA.14 cont.

	Panel D: Model 7 (Book Assets)			Panel E: Model 8 (Sales)			Panel F: Model 9 (MktCap + Assets - Q)		
	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$
MKT	0.1394 (1.153)	0.0277	0.0038	0.2155 * (1.743)	0.0277	0.0088	0.7678 *** (4.088)	0.0277	0.0616
FF3	0.1258 (1.104)	0.0295	0.0033	0.2136 * (1.918)	0.0295	0.0101	0.6746 *** (5.968)	0.0295	0.0954
FF3 + UMD	0.2684 ** (2.426)	0.0591	0.0175	0.3111 *** (2.810)	0.0591	0.0231	0.7108 *** (5.995)	0.0591	0.1066
FF 5	0.1366 (1.307)	0.1196	0.0039	0.2487 ** (2.395)	0.1196	0.0138	0.5863 *** (4.997)	0.1196	0.0730
FF 5 + UMD	0.2465 ** (2.387)	0.1366	0.0149	0.3222 *** (3.029)	0.1366	0.0248	0.6193 *** (5.044)	0.1366	0.0824
FF 5 + UMD + BAB	0.2689 ** (2.458)	0.1588	0.0177	0.2771 *** (2.619)	0.1588	0.0187	0.5520 *** (4.486)	0.1588	0.0683
FF 5 + UMD + QMJ	0.2388 ** (2.259)	0.1990	0.0139	0.3335 *** (3.077)	0.1990	0.0265	0.6569 *** (5.154)	0.1990	0.0929
StY 4	0.2358 * (1.750)	0.1964	0.0117	0.3097 ** (2.271)	0.1964	0.0214	0.6501 *** (4.020)	0.1964	0.0780
LP 5	0.2549 ** (2.221)	0.1935	0.0165	0.3305 *** (2.684)	0.1935	0.0272	0.6534 *** (4.995)	0.1935	0.0881
KNS 5	0.1536 (1.355)	0.0959	0.0055	0.2351 ** (1.989)	0.0959	0.0131	0.4558 *** (3.064)	0.0959	0.0334

Table OA.15: **Excluded Factor Regressions – SMB – Alternative Takeover Likelihood Models**

This table reports excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the size factor, and the factor models (independent variables) replace the SMB factor with the corresponding TMA factor and/or with the QMJ factor of Asness et al. (2018). The TMA factor is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. In Panel A, takeover likelihood is calculated using the coefficients from Model 2 and the SDC sample period (1990–2020). In Panel B, takeover likelihood is calculated using the coefficients from Model 5 and the SDC sample period. Banks are excluded from the estimation sample in Model 5, but are included in the sample in this table. In Panel C, takeover likelihood is calculated using the coefficients from Models 6 in Table OA.13 and the SDC sample period (1990–2020). All other independent variables (RHS factors) are defined as in Table OA.14. α columns report the intercepts from the excluded factor regressions. $Sh^2(f)$ columns report the maximum squared Sharpe ratio from the tangency portfolio that includes the factors in the row labels (i.e., only the RHS factors). $\alpha^2/s^2(e)$ columns report the SMB factor's marginal contribution to $Sh^2(f)$, as in Fama and French (2018). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Model 2 (CNJ)			Panel B: Model 5 (Exclude Banks)			Panel C: Model 6 (Excluding Size)		
	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$
MKT	0.0088 (0.057)	0.0277	0.0000	0.0088 (0.057)	0.0277	0.0000	0.0088 (0.057)	0.0277	0.0000
MKT + TMA	-0.3815 *** (-3.086)	0.0753	0.0231	-0.3470 *** (-2.789)	0.0685	0.0188	-0.0487 (-0.323)	0.0345	0.0003
MKT + QMJ	0.4312 ** (2.369)	0.1339	0.0237	0.4312 ** (2.369)	0.1339	0.0237	0.4312 ** (2.369)	0.1339	0.0237
MKT + QMJ + TMA	-0.1308 (-0.967)	0.3105	0.0028	-0.0900 (-0.638)	0.2923	0.0013	0.3633 * (1.955)	0.1543	0.0173
FF 5 - SMB + UMD + TMA	-0.1958 (-1.586)	0.2506	0.0071	-0.2022 (-1.629)	0.2398	0.0078	0.1653 (1.117)	0.1516	0.0040
FF 5 - SMB + UMD + QMJ	0.3846 ** (2.540)	0.1775	0.0211	0.3846 ** (2.540)	0.1775	0.0211	0.3846 ** (2.540)	0.1775	0.0211
FF 5 - SMB + UMD + TMA + QMJ	-0.1446 (-1.082)	0.3569	0.0039	-0.1589 (-1.186)	0.3439	0.0048	0.2740 * (1.774)	0.2048	0.0114
LP 5 + TMA	0.0797 (0.739)	0.3236	0.0020	0.0405 (0.380)	0.3256	0.0005	0.0659 (0.641)	0.2129	0.0014
LP 5 + QMJ	-0.0599 (-0.585)	0.2693	0.0012	-0.0599 (-0.585)	0.2693	0.0012	-0.0599 (-0.585)	0.2693	0.0012
LP 5 + QMJ + TMA	-0.0419 (-0.391)	0.3866	0.0006	-0.0710 (-0.672)	0.3806	0.0017	-0.0567 (-0.558)	0.2779	0.0011
KNS 5 + TMA	-0.0412 (-0.414)	0.1842	0.0005	-0.0689 (-0.708)	0.1746	0.0014	0.0162 (0.167)	0.1030	0.0001
KNS 5 + QMJ	0.1022 (0.986)	0.1984	0.0029	0.1022 (0.986)	0.1984	0.0029	0.1022 (0.986)	0.1984	0.0029
KNS 5 + QMJ + TMA	0.0212 (0.184)	0.3868	0.0001	-0.0243 (-0.219)	0.3659	0.0002	0.0792 (0.752)	0.2172	0.0018

Table OA.16: **Left-Hand-Side Portfolios and Measures of Performance**

This table reports a variety of model performance statistics for a specified set of 'left-hand-side' test assets. We consider a total of 200 left-hand-side portfolios from 5x5 sorts on size or takeover likelihood and, independently, book-to-market, profitability, investment, or momentum. We consider four benchmark models that are common in the literature, as well as for four similar models that replace the conventional SMB factor with the TMA factor. The four benchmark models include the Fama and French (1993) three-factor model, the three-factor model augmented with the Carhart (1997) momentum factor, the Fama and French (2015) five-factor model, and the Fama and French (2018) six factor model. All comparison models that replace the conventional SMB factor with the TMA factor use the quintile version of the SDC sample Model 4 TMA. The reported model performance statistics include the Gibbons et al. (1989) GRS statistic and p-value; the average absolute intercept ($A|a|$); the average squared intercept divided by the average squared difference between the average return on LHS portfolio i and the average return on the value-weighted market ($Aa_i^2/A\bar{r}_i^2$); the average R-squared ($A(R^2)$); and the maximum squared Sharpe ratio for the model's factors ($Sh^2(f)$).

Model	GRS	p(GRS)	$A\|a\|$	$Aa_i^2/A\bar{r}_i^2$	$A(R^2)$	$Sh^2(f)$
MKT + SMB + HML	3.24	0.000	0.2426	0.744	0.845	0.0295
MKT + TMA + HML	3.78	0.000	0.1797	0.510	0.767	0.1081
MKT + SMB + HML + UMD	3.13	0.000	0.3029	1.088	0.876	0.0591
MKT + TMA + HML + UMD	2.70	0.000	0.1389	0.246	0.794	0.1377
MKT + SMB + HML + CMA + RMW	2.87	0.000	0.2221	0.720	0.855	0.1196
MKT + TMA + HML + CMA + RMW	2.68	0.000	0.1651	0.384	0.796	0.1830
MKT + SMB + HML + CMA + RMW + UMD	2.80	0.000	0.2728	1.067	0.885	0.1366
MKT + TMA + HML + CMA + RMW + UMD	2.62	0.000	0.2089	0.555	0.822	0.2024

Table OA.17: **Linear Takeover Probability Model**

This table reports OLS estimates of a linear regression model for takeover probability. The dependent variable is equal to one if an acquisition occurs in that calendar year and zero otherwise. All dependent variables are calculated as in Table 8 in the main paper. All Compustat variables are industry-adjusted (mean) using the Fama French 48 industries. All continuous variables are winsorized at the 1% and 99% levels. Coefficients are reported with standard errors in parentheses. Standard errors are clustered by firm. The sample period extends from January 1990 through December 2020. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)		
Intercept	0.0421 ***	Industry	0.0145 ***
	(0.004)	(BDH)	(0.001)
ln(MktCap)	-0.0030 ***	Leverage	0.0127 ***
	(0.000)		(0.003)
Q	-0.0001	ROA	0.0014
	(0.000)		(0.002)
PPE	-0.0015	Dividend	-0.0009
	(0.002)		(0.001)
ln(Cash)	-0.0005	LRET	-0.0025 ***
	(0.000)		(0.001)
BLOCK	0.0115 ***	Idiosyncratic	-0.1406 ***
	(0.001)	Volatility	(0.025)
Year Fixed Effects	Y		
Adjusted R^2	0.06%		
Observations	138,229		
Targets	4,925		

Table OA.18: **Excluded Factor Regressions – Linear Probability Model**

This table reports excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). Units are expressed in percentage points and robust t-statistics are reported in parentheses. In Panel A, the dependent variable is the takeover probability factor and the independent variables are the factors that correspond to the factor model in the row labels. In Panel B, the dependent variable is the size factor, and the factor models (independent variables) replace the SMB factor with the corresponding TMA factor. All independent variables (RHS factors) are defined as in Table OA.14. Takeover likelihood is calculated using the coefficients from the linear probability model in Table OA.17. The TMA is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. α columns report the intercepts from the excluded factor regressions. $Sh^2(f)$ columns report the maximum squared Sharpe ratio from the tangency portfolio that includes the factors in the row labels (i.e., only the RHS factors). $\alpha^2/s^2(e)$ columns report the corresponding LHS factor's marginal contribution to $Sh^2(f)$, as in Fama and French (2018). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: TMA				Panel B: SMB			
	α	$Sh^2(f)$	$a^2/s^2(e)$		α	$Sh^2(f)$	$a^2/s^2(e)$
MKT	0.6270 *** (4.588)	0.0277	0.0761	MKT + TMA	-0.1900 (-1.197)	0.1040	0.0040
FF3	0.5896 *** (5.149)	0.0295	0.0830	MKT + HML + TMA	-0.2338 (-1.565)	0.1065	0.0066
FF3 + UMD	0.5872 *** (4.908)	0.0591	0.0821	MKT + HML + TMA + UMD	-0.2496 (-1.569)	0.1344	0.0075
FF 5	0.4751 *** (4.143)	0.1196	0.0559	FF 5 - SMB + TMA	0.0420 (0.294)	0.1759	0.0003
FF 5 + UMD	0.4795 *** (3.985)	0.1366	0.0568	FF 5 - SMB + TMA + UMD	0.0187 (0.129)	0.1943	0.0001
FF 5 + UMD + BAB	0.3522 *** (3.369)	0.1588	0.0374	FF 5 - SMB + TMA + UMD + BAB	0.0294 (0.203)	0.1968	0.0001
FF 5 + UMD + QMJ	0.5252 *** (4.363)	0.1990	0.0685	FF 5 - SMB + TMA + UMD + QMJ	0.1113 (0.719)	0.2668	0.0020
StY 4	0.4722 *** (3.103)	0.1964	0.0514	StY 4 - SMB + TMA	0.1708 (1.015)	0.2447	0.0037
LP 5	0.5261 *** (3.880)	0.1935	0.0679	LP 5 + TMA	0.0119 (0.119)	0.2624	0.0000
KNS 5	0.4234 *** (3.296)	0.0959	0.0446	KNS 5 + TMA	-0.0384 (-0.405)	0.1411	0.0004

Table OA.19: **Excluded Factor Regressions – HML**

This table reports excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the value factor, and the factor models (independent variables) replace the SMB factor with the corresponding TMA factor. Takeover likelihood is calculated using the coefficients from the Model 4 in Table 8 in the main paper and the full sample period. The TMA factor is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. All other factors are defined as in Table OA.14. α columns report the intercepts from the excluded factor regressions. R^2 columns report the adjusted R^2. $Sh^2(f)$ columns report the maximum squared Sharpe ratio from the tangency portfolio that includes the factors in the row labels (i.e., only the RHS factors). $\alpha^2/s^2(e)$ columns report the HML factor's marginal contribution to $Sh^2(f)$, as in Fama and French (2018). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: Extended Sample (1963–2020)			Panel B: Pre-Sample (1963–1989)			Panel C: SDC Sample (1990–2020)		
	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$	α	$Sh^2(f)$	$\alpha^2/s^2(e)$
MKT	0.3301 *** (2.696)	0.0162	0.0139	0.5655 *** (3.998)	0.0076	0.0542	0.1258 (0.641)	0.0277	0.0017
MKT + TMA	0.2027 * (1.687)	0.0520	0.0056	0.4553 *** (3.284)	0.0320	0.0382	-0.0946 (-0.498)	0.1071	0.0010
MKT + TMA + UMD	0.3242 *** (2.670)	0.0283	0.0149	0.5346 *** (3.523)	0.1149	0.0533	0.0395 (0.202)	0.1375	0.0002
MKT + TMA + CMA + RMW	-0.1424 (-1.438)	0.0298	0.0049	0.2059 * (1.927)	0.1964	0.0161	-0.4141 *** (-2.739)	0.1463	0.0362
MKT + TMA + CMA + RMW + UMD	-0.0419 (-0.449)	0.0289	0.0004	0.2299 ** (2.037)	0.2707	0.0200	-0.2994 ** (-2.030)	0.1816	0.0205
MKT + TMA + CMA + RMW + UMD + BAB	-0.0632 (-0.683)	0.0304	0.0010	0.2103 * (1.907)	0.3150	0.0168	-0.3077 ** (-2.168)	0.1819	0.0226
MKT + TMA + CMA + RMW + UMD + QMJ	0.0867 (1.022)	0.0305	0.0020	0.3236 *** (2.893)	0.3424	0.0415	-0.1459 (-1.112)	0.2686	0.0052
StY 4 - SMB + TMA	-0.0172 (-0.209)	0.0314	0.0001	0.0298 (0.291)	0.3108	0.0004	-0.0490 (-0.347)	0.2538	0.0006
LP 5 + TMA	0.0695 (1.154)	0.0369	0.0032	0.0161 (0.203)	0.8103	0.0002	-0.0312 (-0.400)	0.2696	0.0006
KNS 5 + TMA	-0.1148 (-1.075)	0.1656	0.0033	-0.2144 * (-1.862)	0.3712	0.0210	-0.2884 ** (-2.300)	0.148	0.0192

Table OA.20: **Excluded Factor Regressions – CMA**

This table reports excluded monthly factor regression alphas for a variety of factor models, as in Barillas and Shanken (2017). Units are expressed in percentage points and robust t-statistics are reported in parentheses. In all regressions, the dependent variable is the investment factor, and the factor models (independent variables) replace the SMB factor with the corresponding TMA factor. Takeover likelihood is calculated using the coefficients from the Model 4 in Table 8 in the main paper and the full sample period. The TMA factor is formed using the highest and lowest quintiles of takeover probability to define 'high' and 'low'. All other factors are defined as in Table OA.14. α columns report the intercepts from the excluded factor regressions. R^2 columns report the adjusted R^2. $Sh^2(f)$ columns report the maximum squared Sharpe ratio from the tangency portfolio that includes the factors in the row labels (i.e., only the RHS factors). $\alpha^2/s^2(e)$ columns report the CMA factor's marginal contribution to $Sh^2(f)$, as in Fama and French (2018). ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	α	R^2	$Sh^2(f)$	$\alpha^2/s^2(e)$
MKT	0.2948 *** (2.591)	0.123	0.0277	0.0234
MKT + TMA	0.1769 * (1.696)	0.162	0.1071	0.0088
MKT + TMA + HML	0.2143 ** (2.420)	0.486	0.1081	0.0211
MKT + TMA + HML + UMD	0.1838 ** (2.018)	0.492	0.1377	0.0157
MKT + TMA + HML + RMW	0.2583 *** (2.892)	0.495	0.1514	0.0312
MKT + TMA + HML + RMW + UMD	0.2279 ** (2.449)	0.503	0.1774	0.0247
MKT + TMA + HML + RMW + UMD + BAB	0.2239 ** (2.357)	0.502	0.1807	0.0238
MKT + TMA + HML + RMW + UMD + QMJ	0.2119 ** (2.294)	0.502	0.2522	0.0213
StY 4 - SMB + TMA	-0.0207 (-0.232)	0.570	0.2538	0.0002
LP 5 + TMA	0.2004 ** (2.399)	0.619	0.2696	0.0247
KNS 5 + TMA	0.0510 (0.553)	0.404	0.1480	0.0010

Table OA.21: **Takeover Probability Model – Measures of Firm Quality**

This table reports MLE estimates of a logistic regression model for takeover probability. The dependent variable is equal to one if an acquisition occurs in that calendar year and zero otherwise. Profitability is the defined at the profitability score from Asness et al. (2019). Growth is the defined at the growth score from Asness et al. (2019), except that all variables are measured as the one-year change as opposed to the five-year change. Safety is the defined at the safety score from Asness et al. (2019), except that earnings volatility is omited and betas are measured using one-year rolling daily CAPM regressions. Quality is the average of the profitability, growth, and safety scores. Control variables include all dependent variables from Model 4 in Table 8 in the main paper. Coefficients are reported with standard errors in parentheses and odds ratios in brackets. Odds ratios are estimated as $\exp(\beta_i * \sigma_i)$, where β_i denotes the estimated coefficient of independent variable i and σ_i denotes the standard deviation of independent variable i. The sample period extends from January 1990 through December 2020. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Quality	-0.1620 ***	-0.0087		
	(0.054)	(0.068)		
	[0.923]	[0.996]		
Profitability			0.1275 **	0.1886 ***
			(0.056)	(0.062)
			[1.081]	[1.123]
Growth			0.0496	0.0519
			(0.045)	(0.047)
			[1.035]	[1.037]
Safety			-0.4437 ***	-0.4598 ***
			(0.057)	(0.077)
			[0.788]	[0.781]
Controls	N	Y	N	Y
Year Fixed Effects	Y	Y	Y	Y
Pseudo R^2	1.083%	1.936%	1.442%	2.203%
Observations	78,420			
Targets	1,458			