# Internet Appendix

# for

# R&D Spillover and Predictable Returns

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Table IA1: Monthly alphas to the portfolios of Peers categorized by R&D growth or level.

This table presents the alphas to the equal-weighted and value-weighted portfolios of R&D Peers. In Panel A, we divide Peers into subsamples based on their R&D growth or level (RDA, i.e., R&D relative to assets) in the year $t$. In Panel B, we divide Peers into subsamples based on their R&D growth or level (RDA) in the year $t+1$. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. The $t$-statistics are reported in the parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels. The sample period is 1975-2012.

Panel A: Peers are divided into subsamples based on their R&D growth or level (RDA) in the year $t$

| | Equal-weighted portfolios | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | R&D growth | | | RDA | | |
| | High | Low | Difference | High | Low | Difference |
| **Alpha** | **0.57*** | **0.47*** | **0.10** | **0.64*** | **0.41*** | **0.22** |
| | **(4.17)** | **(2.99)** | **(0.98)** | **(3.14)** | **(3.34)** | **(1.49)** |
| RMRF | 1.13*** | 1.09*** | 0.04* | 1.18*** | 1.06*** | 0.12*** |
| | (34.98) | (29.41) | (1.67) | (24.60) | (36.32) | (3.36) |
| SMB | 1.17*** | 1.14*** | 0.02 | 1.41*** | 1.00*** | 0.41*** |
| | (26.54) | (22.67) | (0.73) | (21.64) | (25.16) | (8.54) |
| HML | -0.51*** | -0.17*** | -0.35*** | -0.68*** | -0.09** | -0.59*** |
| | (-10.38) | (-2.98) | (-9.28) | (-9.20) | (-2.00) | (-10.77) |
| UMD | -0.22*** | -0.24*** | 0.02 | -0.29*** | -0.15*** | -0.14*** |
| | (-6.85) | (-6.57) | (0.91) | (-6.28) | (-5.34) | (-4.09) |

| | Value-weighted portfolios | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | R&D growth | | | RDA | | |
| | High | Low | Difference | High | Low | Difference |
| **Alpha** | **0.38*** | **0.21*** | **0.17** | **0.39**** | **0.19**** | **0.19** |
| | **(3.06)** | **(1.76)** | **(1.60)** | **(2.14)** | **(2.04)** | **(1.33)** |
| RMRF | 1.15*** | 1.11*** | 0.04* | 1.23*** | 1.09*** | 0.14*** |
| | (39.33) | (38.74) | (1.68) | (28.94) | (48.54) | (4.21) |
| SMB | 1.03*** | 0.91*** | 0.12*** | 1.24*** | 0.80*** | 0.43*** |
| | (25.89) | (23.43) | (3.53) | (21.38) | (26.42) | (9.32) |
| HML | -0.61*** | -0.14*** | -0.47*** | -0.76*** | -0.15*** | -0.61*** |
| | (-13.49) | (-3.17) | (-12.44) | (-11.65) | (-4.34) | (-11.69) |
| UMD | -0.23*** | -0.29*** | 0.06*** | -0.31*** | -0.19*** | -0.12*** |
| | (-8.06) | (-10.29) | (2.42) | (-7.52) | (-8.80) | (-3.60) |

Panel B: Peers are divided into subsamples based on their R&D growth or level (RDA) in the year *t+1*

| | Equally-weighted portfolios | | | | | |
|---|---|---|---|---|---|---|
| | R&D growth | | | RDA | | |
| | High | Low | Difference | High | Low | Difference |
| **Alpha** | **0.64*** ** | **0.47*** ** | **0.18** | **0.72*** ** | **0.32** ** | **0.40*** ** |
| | **(4.02)** | **(2.63)** | **(1.25)** | **(3.79)** | **(2.13)** | **(2.50)** |
| RMRF | 1.13*** | 1.09*** | 0.04 | 1.18*** | 1.01*** | 0.17*** |
| | (29.42) | (25.54) | (1.24) | (25.82) | (27.61) | (4.50) |
| SMB | 1.08*** | 1.05*** | 0.03 | 1.23*** | 0.88*** | 0.35*** |
| | (21.00) | (18.45) | (0.61) | (20.01) | (17.88) | (6.86) |
| HML | -0.54*** | -0.21*** | -0.33*** | -0.60*** | -0.06 | -0.54*** |
| | (-9.09) | (-3.17) | (-6.29) | (-8.41) | (-1.01) | (-9.11) |
| UMD | -0.27*** | -0.20*** | -0.07** | -0.26*** | -0.14*** | -0.12*** |
| | (-7.34) | (-4.94) | (-2.11) | (-6.05) | (-4.14) | (-3.29) |

| | Value-weighted portfolios | | | | | |
|---|---|---|---|---|---|---|
| | R&D growth | | | RDA | | |
| | High | Low | Difference | High | Low | Difference |
| **Alpha** | **0.41*** ** | **0.25* ** | **0.16** | **0.46*** ** | **0.17** | **0.29* ** |
| | **(2.83)** | **(1.81)** | **(1.19)** | **(2.71)** | **(1.39)** | **(1.85)** |
| RMRF | 1.15*** | 1.12*** | 0.03 | 1.21*** | 1.05*** | 0.16*** |
| | (33.02) | (33.21) | (0.86) | (29.91) | (35.68) | (4.25) |
| SMB | 0.95*** | 0.91*** | 0.04 | 1.07*** | 0.75*** | 0.33*** |
| | (20.23) | (20.02) | (0.88) | (19.77) | (18.84) | (6.58) |
| HML | -0.61*** | -0.28*** | -0.33*** | -0.69*** | -0.12*** | -0.58*** |
| | (-11.31) | (-5.37) | (-6.73) | (-11.05) | (-2.59) | (-9.98) |
| UMD | -0.27*** | -0.21*** | -0.06** | -0.27*** | -0.18*** | -0.09*** |
| | (-8.22) | (-6.63) | (-1.97) | (-7.00) | (-6.32) | (-2.61) |

Table IA2: Alternative definition of Leaders and Peers: Leaders with large dollar size of R&D spending

We impose an additional requirement for the dollar size of R&D spending when identifying R&D Leaders. Specifically, for those industry-year that experiences an R&D increase event, we select as Leader candidates those firms that have meaningful R&D expenditures (R&D to sales ratio and R&D to assets ratio are both greater than 2% in year t-1, with year t being the identification year.) and whose absolute dollar size of R&D to industry dollar size of R&D ratio ranks among the top 10% (or top 5, whichever has a larger number of firms) in the industry. Panel A presents the alphas to the equally-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year t and $t-1$ divided by R&D expenditures in year $t-1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series $t$-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel C and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the 1$^{th}$ and 99$^{th}$ percentiles. $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

| | Equal-Weighted | | Value-Weighted | |
|---|---|---|---|---|
| | Leaders | Peers | Leaders | Peers |
| **Alpha** | **0.67\*\*\*** | **0.33\*\*\*** | **0.46\*\*\*** | **0.19\*\*** |
| | **(3.89)** | **(2.68)** | **(2.76)** | **(2.03)** |
| RMRF | 1.21\*\*\* | 1.04\*\*\* | 1.23\*\*\* | 1.07\*\*\* |
| | (29.95) | (36.41) | (31.49) | (48.46) |
| SMB | 1.23\*\*\* | 0.99\*\*\* | 1.15\*\*\* | 0.82\*\*\* |
| | (21.73) | (24.69) | (21.02) | (26.61) |
| HML | -0.75\*\*\* | -0.14\*\*\* | -0.85\*\*\* | -0.13\*\*\* |
| | (-11.92) | (-3.07) | (-13.92) | (-3.86) |
| UMD | -0.12\*\*\* | -0.21\*\*\* | -0.12\*\*\* | -0.23\*\*\* |
| | (-2.97) | (-7.32) | (-2.95) | (-10.30) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 14.27\*\*\* | 16.65\*\* |
| | (3.24) | (2.28) |
| Leader | 8.07\*\* | 10.35\*\* |
| | (2.03) | (2.57) |
| **Peer** | **5.03\*\*** | **7.52\*\*\*** |
| | **(2.16)** | **(3.36)** |
| R&D growth | | 1.02\*\*\* |
| | | (2.94) |
| Ln(Size) | | -1.69\*\* |
| | | (-2.36) |
| B/M | | 6.27\*\*\* |
| | | (4.46) |
| Negative B/M dummy | | 5.46\* |
| | | (1.80) |
| PrPret | | 0.19 |
| | | (1.37) |
| Industry PrRET | | 0.11\*\* |
| | | (2.50) |
| $R^2$ | 0.003 | 0.03 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
| Intercept | 7.90*** | 2.78*** | 6.18*** | 7.54*** | 2.94*** | 5.80*** | 7.25*** | 3.03*** | 5.94*** |
| | (34.84) | (9.21) | (22.26) | (37.09) | (15.75) | (28.88) | (41.77) | (10.30) | (15.00) |
| Leader | 3.42*** | 3.45*** | 4.80*** | 2.46*** | 2.41*** | 2.99*** | 2.27*** | 2.96*** | 3.23*** |
| | (5.91) | (3.54) | (5.40) | (4.02) | (3.73) | (3.84) | (3.34) | (2.71) | (3.47) |
| **Peer** | **2.70*** | **1.49*** | **2.49**** | **2.50*** | **1.17**** | **1.87*** | **2.24*** | **1.45*** | **1.72*** |
| | **(5.43)** | **(1.69)** | **(2.48)** | **(5.38)** | **(2.17)** | **(3.99)** | **(4.83)** | **(2.64)** | **(3.73)** |
| R&D growth | 8.19*** | 3.59 | 6.64 | 9.57*** | 9.37*** | 11,44*** | 8.96*** | 5.31*** | 6.48** |
| | (3.02) | (0.63) | (1.16) | (3.29) | (6.85) | (4.46) | (3.73) | (3.04) | (2.20) |
| Ln(Size) | -3.43*** | -0.52*** | -3.13*** | -3.28*** | -0.49*** | -2.91*** | -3.18*** | -0.65*** | -3.13*** |
| | (-13.36) | (-3.10) | (-15.30) | (-11.69) | (-3.18) | (-14.72) | (-12.13) | (-2.83) | (-11.50) |
| B/M | -23.77*** | -7.20*** | -21.24*** | -20.41*** | -7.12*** | -18.21*** | -16.73*** | -8.13*** | -19.42*** |
| | (-9.53) | (-4.24) | (-7.52) | (-9.58) | (-6.18) | (-8.52) | (-9.88) | (-3.42) | (-3.91) |
| Negative B/M dummy | -5.93* | -1.95 | 1.63 | -1.79 | 1.28 | 8.79 | 3.08 | -0.16 | 7.40 |
| | (-1.90) | (-1.42) | (0.39) | (-0.40) | (0.44) | (1.27) | (0.43) | (-0.05) | (0.90) |
| PrRET | 0.60** | 0.17 | 0.77** | 2.62* | 0.72 | 1.96** | 2.88** | -0.55 | -0.60 |
| | (2.17) | (0.87) | (2.20) | (1.87) | (1.35) | (2.08) | (2.04) | (-1.48) | (-1.45) |
| lag OP | 34.15*** | 26.83*** | 38.40*** | 33.76*** | 48.67*** | 37.65*** | 34.79*** | 21.19*** | 39.97*** |
| | (5.31) | (4.97) | (5.22) | (3.09) | (4.64) | (5.48) | (2.91) | (5.04) | (3.60) |
| $R^2$ | 0.10 | 0.10 | 0.09 | 0.11 | 0.09 | 0.08 | 0.10 | 0.09 | 0.08 |

Table IA3: Alternative definition of Leaders and Peers based on the industry-aggregate R&D growth rate

We define an R&D increase event based on the industry-aggregate R&D growth rate. An industry is defined as having such an event if it ranks in the top 20% quintile across the 48 industries in a given year. Then, within an identified industry, we define R&D Leaders as those firms that have meaningful R&D expenditures (R&D to sales ratio and R&D to assets ratio are both greater than 2% in year t-1, with year t being the identification year.) and whose absolute R&D growth rates rank among the top 10% (or top 5, whichever has a larger number of firms) in the industry, and the remaining firms in the industry are defined as Peers. Panel A presents the alphas to the equally-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year t and $t-1$ divided by R&D expenditures in year $t-1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series $t$-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the 1th and 99th percentiles. $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

|  | Equally-Weighted | | Value-Weighted | |
|---|---|---|---|---|
|  | Leaders | Peers | Leaders | Peers |
| **Alpha** | **0.65*** ** | **0.34*** ** | **0.47*** ** | **0.23*** ** |
|  | **(3.24)** | **(2.85)** | **(2.45)** | **(2.43)** |
| RMRF | 1.35*** | 1.10*** | 1.38*** | 1.13*** |
|  | (28.84) | (38.98) | (30.84) | (51.46) |
| SMB | 1.37*** | 1.12*** | 1.29*** | 0.93*** |
|  | (20.76) | (28.08) | (20.46) | (30.11) |
| HML | -0.71*** | -0.27*** | -0.87*** | -0.32*** |
|  | (-9.70) | (-6.15) | (-12.41) | (-9.21) |
| UMD | -0.15*** | -0.20*** | -0.13*** | -0.23*** |
|  | (-3.11) | (-6.95) | (-2.87) | (-10.23) |

Panel B: Fama-MacBeth Regressions of Stock Returns

|  | (1) | (2) |
|---|---|---|
| Intercept | 13.62*** | 15.58** |
|  | (3.15) | (2.17) |
| Leader | 11.11*** | 13.62** |
|  | (2.85) | (2.54) |
| **Peer** | **7.30*** ** | **9.88*** ** |
|  | **(3.29)** | **(4.41)** |
| R&D growth |  | 0.79** |
|  |  | (2.48) |
| Ln(Size) |  | -1.71** |
|  |  | (-2.37) |
| B/M |  | 6.74*** |
|  |  | (4.89) |
| Negative B/M dummy |  | 6.50** |
|  |  | (2.13) |
| PrPret |  | 0.19 |
|  |  | (1.37) |
| Industry PrRET |  | 0.12*** |
|  |  | (2.84) |
| $R^2$ | 0.005 | 0.03 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
| Intercept | 7.71*** | 2.54*** | 5.95*** | 7.37*** | 2.73*** | 5.61*** | 7.04*** | 2.40*** | 5.38*** |
| | (34.91) | (8.25) | (23.51) | (36.61) | (13.85) | (33.09) | (38.54) | (6.37) | (14.41) |
| Leader | 2.82*** | 5.11*** | 5.98*** | 2.98*** | 5.35*** | 8.98* | 2.47*** | 0.01 | 0.94 |
| | (2.84) | (2.65) | (4.19) | (2.94) | (3.20) | (1.95) | (2.98) | (0.01) | (0.92) |
| **Peer** | **2.62*** | **1.74*** | **2.62*** | **2.36*** | **1.50*** | **2.18*** | **2.15*** | **1.55*** | **2.22*** |
| | **(5.35)** | **(3.15)** | **(5.13)** | **(5.07)** | **(3.33)** | **(6.51)** | **(4.32)** | **(3.26)** | **(3.89)** |
| R&D growth | 6.66*** | 2.72 | 5.41** | 4.52*** | 3.16 | 3.82 | 5.22*** | 7.98*** | 8.90*** |
| | (4.39) | (1.00) | (2.30) | (2.88) | (1.23) | (1.48) | (2.89) | (4.27) | (3.57) |
| Ln(Size) | -3.37*** | -0.47*** | -3.06*** | -3.21*** | -0.51*** | -2.89*** | -3.12*** | -0.44* | -2.86*** |
| | (-13.35) | (-2.65) | (-15.51) | (-11.54) | (-3.46) | (-15.45) | (-11.80) | (-1.87) | (-10.03) |
| B/M | -22.48*** | -6.17*** | -19.82*** | -19.15*** | -5.98*** | -16.86*** | -15.54*** | -5.31** | -16.66*** |
| | (-9.76) | (-4.26) | (-7.85) | (-10.13) | (-6.51) | (-9.27) | (-10.40) | (-2.16) | (-3.44) |
| Negative B/M dummy | -4.51 | -0.70 | 3.12 | -0.74 | 2.14 | 9.72 | 4.31 | 1.33 | 8.67 |
| | (-1.45) | (-0.44) | (0.74) | (-0.17) | (0.72) | (1.41) | (0.60) | (0.38) | (1.06) |
| PrRET | 0.65** | 0.13 | 0.71* | 4.44 | 0.23 | 3.60* | 3.08* | -0.74 | 2.46 |
| | (2.01) | (0.76) | (1.76) | (1.53) | (0.51) | (1.83) | (1.72) | (-0.85) | (1.51) |
| lag OP | 34.78*** | 30.74*** | 39.98*** | 34.50*** | 23.32*** | 40.40*** | 37.37*** | 28.69*** | 43.05*** |
| | (5.33) | (5.15) | (5.34) | (3.33) | (4.80) | (4.72) | (3.75) | (4.76) | (4.68) |
| $R^2$ | 0.09 | 0.09 | 0.08 | 0.09 | 0.08 | 0.08 | 0.11 | 0.10 | 0.09 |

Table IA4: Alternative definition of Leaders and Peers based on the long-run R&D growth rate

For robustness, we identify R&D Leaders based on three-year R&D growth rate (the growth rate of R&D during years *t-2* to year *t* over the period from year *t-5* to *t-3*) and report the results in Panel A-C. Panel A presents the alphas to the equally-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year *t* to June of year *t+1*. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year *t* and *t–1* divided by R&D expenditures in year *t–1*. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year *t*. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year *t*. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series *t*-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year *t+1*, *t+2* and *t+3*, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year *t*. All variables except *PrRet* are winsorized at the 1th and 99th percentiles. *t*-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

| | Equal-Weighted | | Value-Weighted | |
| | Leaders | Peers | Leaders | Peers |
|---|---|---|---|---|
| **Alpha** | **0.53***** | **0.35***** | **0.46***** | **0.24***** |
| | **(2.72)** | **(2.97)** | **(2.50)** | **(2.61)** |
| RMRF | 1.15*** | 1.03*** | 1.14*** | 1.05*** |
| | (25.26) | (37.36) | (26.18) | (47.69) |
| SMB | 1.16*** | 1.11*** | 1.03*** | 0.91*** |
| | (18.19) | (28.80) | (16.76) | (29.59) |
| HML | -0.36*** | -0.03 | -0.51*** | -0.05 |
| | (-5.00) | (-0.66) | (-7.52) | (-1.41) |
| UMD | -0.11** | -0.06** | -0.15*** | -0.09*** |
| | (-2.32) | (-2.07) | (-3.38) | (-3.90) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 13.91*** | 16.09** |
| | (3.19) | (2.22) |
| Leader | 9.23** | 11.80*** |
| | (1.97) | (2.38) |
| **Peer** | **7.14*** | **10.65*** |
| | **(3.40)** | **(3.82)** |
| R&D growth | | 1.02*** |
| | | (2.80) |
| Ln(Size) | | -1.67*** |
| | | (-2.35) |
| B/M | | 6.48*** |
| | | (4.52) |
| Negative B/M dummy | | 6.00* |
| | | (1.95) |
| PrPret | | 0.00 |
| | | (1.37) |
| Industry PrRET | | 0.12*** |
| | | (2.61) |
| $R^2$ | 0.003 | 0.03 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
| Intercept | 7.83*** | 2.75*** | 6.09*** | 7.47*** | 2.82*** | 5.67*** | 7.23*** | 2.99*** | 5.92*** |
| | (35.29) | (9.16) | (24.37) | (36.85) | (13.85) | (28.84) | (41.74) | (10.33) | (15.73) |
| Leader | 2.43*** | 0.65 | 1.34 | 1.94*** | 2.37*** | 3.43*** | 1.60** | 0.76 | 1.54* |
| | (3.12) | (0.37) | (1.00) | (2.61) | (3.21) | (3.97) | (2.01) | (0.71) | (1.74) |
| **Peer** | **2.19***** | **0.85** | **1.68*** | **2.03***** | **2.63***** | **3.64***** | **1.73***** | **1.78**** | **2.28***** |
| | **(5.25)** | **(1.23)** | **(1.84)** | **(4.84)** | **(3.33)** | **(3.77)** | **(3.78)** | **(2.19)** | **(2.89)** |
| R&D growth | 1.64** | 5.60*** | 5.64** | 2.68*** | 2.00*** | 1.13 | 2.80*** | 2.82** | 3.19** |
| | (2.11) | (2.67) | (2.31) | (3.06) | (3.02) | (1.06) | (3.11) | (1.97) | (2.04) |
| Ln(Size) | -3.39*** | -0.52*** | -3.11*** | -3.23*** | -0.48*** | -2.85*** | -3.17*** | -0.70*** | -3.16*** |
| | (-13.39) | (-2.89) | (-16.04) | (-11.42) | (-2.95) | (-14.64) | (-12.28) | (-3.51) | (-13.02) |
| B/M | -23.22*** | -7.38*** | -20.64*** | -19.62*** | -6.56*** | -17.33*** | -16.85*** | -7.55*** | -18.94*** |
| | (-10.07) | (-4.92) | (-8.60) | (-10.56) | (-6.31) | (-9.20) | (-9.62) | (-3.21) | (-3.84) |
| Negative B/M dummy | -5.51* | -1.29 | 2.39 | -1.43 | 2.06 | 9.65 | 3.28 | 0.04 | 7.52 |
| | (-1.79) | (-0.91) | (0.57) | (-0.32) | (0.72) | (1.42) | (0.46) | (0.01) | (0.92) |
| PrRET | 0.68*** | 0.06 | 0.73* | 2.54* | 0.61 | 1.87* | 2.86** | -54.20 | -58.93 |
| | (2.38) | (0.48) | (1.90) | (1.77) | (1.11) | (1.91) | (2.13) | (-1.48) | (-1.44) |
| lag OP | 19.42*** | 42.64*** | 23.78*** | 18.86*** | 35.32*** | 23.28*** | 20.04*** | 37.54*** | 24.63*** |
| | (5.34) | (5.01) | (5.19) | (3.20) | (4.46) | (4.85) | (2.95) | (4.82) | (4.01) |
| $R^2$ | 0.09 | 0.08 | 0.07 | 0.09 | 0.09 | 0.08 | 0.09 | 0.10 | 0.08 |

Table IA5: Alternative sample: Exclude three industries with frequent R&D increase events

For robustness, we exclude the industries that appear more than half of the sample periods (i.e., medical equipment, computers, and business services). Panel A presents the alphas to the equal-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year $t$ and $t–1$ divided by R&D expenditures in year $t–1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series $t$-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the 1$^{th}$ and 99$^{th}$ percentiles. $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

|  | Equal-Weighted | | Value-Weighted | |
|---|---|---|---|---|
|  | Leaders | Peers | Leaders | Peers |
| **Alpha** | **0.62**\*\* | **0.42**\*\*\* | **0.57**\* | **0.29**\*\* |
|  | **(2.07)** | **(2.73)** | **(1.89)** | **(2.11)** |
| RMRF | 1.33\*\*\* | 1.12\*\*\* | 1.31\*\*\* | 1.13\*\*\* |
|  | (17.07) | (31.26) | (16.69) | (34.95) |
| SMB | 1.49\*\*\* | 1.06\*\*\* | 1.38\*\*\* | 0.88\*\*\* |
|  | (13.59) | (21.06) | (12.50) | (19.34) |
| HML | -0.61\*\*\* | -0.23\*\*\* | -0.73\*\*\* | -0.30\*\*\* |
|  | (-4.97) | (-4.06) | (-5.90) | (-5.87) |
| UMD | -0.19\*\*\* | -0.20\*\*\* | -0.17\*\* | -0.24\*\*\* |
|  | (-2.49) | (-5.69) | (-2.11) | (-7.49) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 13.92*** | 13.95** |
| | (3.34) | (2.13) |
| Leader | 10.23* | 11.97*** |
| | (1.92) | (2.50) |
| **Peer** | **6.91\*\*** | **9.07\*\*\*** |
| | **(2.01)** | **(2.70)** |
| R&D growth | | 0.95*** |
| | | (3.05) |
| Ln(Size) | | -1.27** |
| | | (-2.04) |
| B/M | | 6.53*** |
| | | (4.64) |
| Negative B/M dummy | | 4.90* |
| | | (1.73) |
| PrPret | | 0.00* |
| | | (1.79) |
| Industry PrRET | | 0.13*** |
| | | (2.96) |
| $R^2$ | 0.004 | 0.03 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
|---|---|---|---|---|---|---|---|---|---|
| Intercept | 7.78*** | 2.58*** | 5.99*** | 7.48*** | 2.89*** | 5.71*** | 7.15*** | 2.59*** | 5.54*** |
| | (34.48) | (8.47) | (22.54) | (36.20) | (16.07) | (31.82) | (38.66) | (7.32) | (15.17) |
| Leader | 3.30*** | 3.50*** | 2.02*** | 2.66** | 4.30*** | 3.48*** | 2.38* | 0.75 | 1.09* |
| | (2.35) | (2.64) | (3.67) | (2.02) | (3.51) | (2.39) | (1.94) | (0.54) | (0.78) |
| **Peer** | **2.50*** | **1.99*** | **1.86** | **2.44*** | **3.75*** | **3.47*** | **2.33*** | **3.19*** | **3.02*** |
| | **(3.90)** | **(1.82)** | **(1.25)** | **(3.33)** | **(4.69)** | **(5.45)** | **(2.96)** | **(3.67)** | **(3.91)** |
| R&D growth | 0.34 | 3.44 | 0.83 | 0.03 | 3.22* | 3.10** | 2.06 | 5.14** | 4.63** |
| | (0.20) | (1.63) | (0.43) | (0.02) | (1.83) | (2.20) | (1.16) | (2.01) | (2.11) |
| Ln(Size) | -3.40*** | -0.45*** | -3.03*** | -3.27*** | -0.53*** | -2.87*** | -3.17*** | -0.45* | -2.85*** |
| | (-12.85) | (-2.47) | (-14.66) | (-11.37) | (-3.45) | (-15.03) | (-11.66) | (-1.85) | (-9.85) |
| B/M | -22.51*** | -6.21*** | -19.81*** | -19.45*** | -6.45*** | -17.32*** | -15.90*** | -5.85*** | -17.28*** |
| | (-9.71) | (-4.19) | (-7.62) | (-9.85) | (-6.31)* | (-8.92) | (-10.07) | (-2.41) | (-3.56) |
| Negative B/M dummy | -4.86 | -0.73 | 2.99 | -1.09 | 1.83 | 9.53 | 3.92 | 0.68 | 7.98 |
| | (-1.55) | (-0.50) | (0.70) | (-0.25) | (0.61) | (1.38) | (0.55) | (0.19) | (0.97) |
| PrRET | 0.74** | 0.25* | 0.89** | 4.83* | 0.11 | 3.71* | 2.24* | -0.77 | 1.82 |
| | (2.18) | (1.71) | (2.01) | (1.69) | (0.24) | (1.90) | (1.84) | (-1.01) | (1.53) |
| lag OP | 33.58*** | 28.72*** | 38.33*** | 32.98*** | 49.07*** | 37.59*** | 35.43*** | 24.02*** | 39.51*** |
| | (4.74) | (4.83) | (4.82) | (2.64) | (4.72) | (5.41) | (3.17) | (5.21) | (5.23) |
| $R^2$ | 0.09 | 0.08 | 0.08 | 0.09 | 0.09 | 0.07 | 0.09 | 0.10 | 0.07 |

Table IA6: Alternative Sample: Including stocks with price below $5

We perform stock return and operating performance regressions including low-priced stocks (price less than $5). Panel A presents the alphas to the equal-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year t and $t–1$ divided by R&D expenditures in year $t–1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series $t$-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the $1^{th}$ and $99^{th}$ percentiles. $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

|  | Equal-Weighted | | Value-Weighted | |
|  | Leaders | Peers | Leaders | Peers |
|---|---|---|---|---|
| **Alpha** | **0.74*** | **0.45*** | **0.63*** | **0.32*** |
|  | **(3.21)** | **(4.13)** | **(2.66)** | **(3.06)** |
| RMRF | 1.28*** | 1.13*** | 1.27*** | 1.12*** |
|  | (23.42) | (43.96) | (22.91) | (45.47) |
| SMB | 1.26*** | 1.07*** | 1.23*** | 0.86*** |
|  | (16.52) | (29.67) | (15.76) | (24.91) |
| HML | -1.11*** | -0.45*** | -1.24*** | -0.48*** |
|  | (-13.08) | (-11.19) | (-14.26) | (-12.49) |
| UMD | -0.24*** | -0.13*** | -0.24*** | -0.20*** |
|  | (-4.49) | (-5.16) | (-4.24) | (-7.94) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 12.10*** | 12.84** |
| | (2.90) | (2.03) |
| Leader | 8.53** | 11.11*** |
| | (2.13) | (3.26) |
| **Peer** | **7.19*** | **9.68*** |
| | **(3.81)** | **(5.28)** |
| R&D growth | | 0.66*** |
| | | (2.71) |
| Ln(Size) | | -1.43*** |
| | | (-2.56) |
| B/M | | 5.60*** |
| | | (4.86) |
| Negative B/M dummy | | 4.88** |
| | | (1.99) |
| PrPret | | 0.00 |
| | | (1.33) |
| Industry PrRET | | -0.02 |
| | | (-0.03) |
| $R^2$ | 0.004 | 0.05 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
|---|---|---|---|---|---|---|---|---|---|
| Intercept | 7.75*** | 2.59*** | 6.01*** | 7.44*** | 2.86*** | 5.70*** | 7.12*** | 2.57*** | 5.52*** |
| | (35.29) | (8.53) | (23.25) | (37.18) | (15.96) | (31.92) | (39.10) | (7.33) | (15.01) |
| Leader | 2.89*** | 3.82* | 4.28*** | 2.54*** | 5.57*** | 8.18* | 2.06** | 0.04 | 0.27 |
| | (2.66) | (1.71) | (2.37) | (2.97) | (3.14) | (1.74) | (1.99) | (0.04) | (0.22) |
| **Peer** | **2.61*** | **1.76*** | **2.29*** | **2.42*** | **1.77*** | **2.30*** | **2.24*** | **1.49*** | **2.05*** |
| | **(5.39)** | **(4.19)** | **(5.58)** | **(5.06)** | **(3.39)** | **(6.19)** | **(4.33)** | **(3.01)** | **(4.45)** |
| R&D growth | 6.54*** | 6.27*** | 8.85*** | 4.52*** | 3.72 | 4.67* | 4.75*** | 7.27*** | 7.74*** |
| | (4.51) | (4.19) | (4.24) | (2.96) | (1.25) | (1.73) | (2.75) | (3.93) | (3.17) |
| Ln(Size) | -3.36*** | -0.46*** | -3.07*** | -3.23*** | -0.51*** | -2.88*** | -3.13*** | -0.44* | -2.88*** |
| | (-13.27) | (-2.59) | (-15.54) | (-11.58) | (-3.42) | (-15.56) | (-11.89) | (-1.88) | (-9.96) |
| B/M | -22.73*** | -6.49*** | -20.26*** | -19.52*** | -6.52*** | -17.42*** | -16.02*** | -5.87*** | -17.26*** |
| | (-9.83) | (-4.36) | (-7.90) | (-10.03) | (-6.56) | (-9.07) | (-10.20) | (-2.45) | (-3.58) |
| Negative B/M dummy | -4.93 | -0.88 | 2.74 | -1.12 | 1.85 | 9.43 | 3.90 | 0.64 | 7.92 |
| | (-1.58) | (-0.59) | (0.65) | (-0.25) | (0.62) | (1.36) | (0.55) | (0.19) | (0.96) |
| PrRET | 0.63** | 0.08 | 0.64* | 4.33 | 0.08 | 3.41* | 1.96* | -0.89 | 1.67 |
| | (2.14) | (0.68) | (1.67) | (1.48) | (0.15) | (1.71) | (1.71) | (-1.02) | (1.40) |
| Lag OP | 34.59*** | 29.42*** | 39.39*** | 33.78*** | 49.86*** | 38.33*** | 36.37*** | 24.92*** | 40.83*** |
| | (5.17) | (4.97) | (5.07) | (3.02) | (5.03) | (5.72) | (3.24) | (5.29) | (5.18) |
| $R^2$ | 0.09 | 0.08 | 0.07 | 0.09 | 0.08 | 0.08 | 0.10 | 0.09 | 0.08 |

Table IA7: Addressing the alternative hypothesis of industry shocks: Excluding the top tercile of industry-years with large demographic-induced demand shocks

We exclude industry-years ranked in the top one-third in terms of demographic-induced demand shocks (see footnote 6 for more specific details), and repeat the stock return regressions and operating performance regressions using the remaining sample. Panel A presents the alphas to the equal-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year $t$ and $t–1$ divided by R&D expenditures in year $t–1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series $t$-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the 1th and 99th percentiles. $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

| | Equal-Weighted | | Value-Weighted | |
|---|---|---|---|---|
| | Leaders | Peers | Leaders | Peers |
| **Alpha** | **0.71*** | **0.41*** | **0.60*** | **0.29*** |
| | **(3.20)** | **(3.14)** | **(2.85)** | **(2.74)** |
| RMRF | 1.36*** | 1.11*** | 1.39*** | 1.14*** |
| | (26.00) | (36.26) | (27.93) | (45.89) |
| SMB | 1.40*** | 1.13*** | 1.34*** | 0.95*** |
| | (19.11) | (26.20) | (19.14) | (27.24) |
| HML | -0.78*** | -0.31*** | -0.95*** | -0.37*** |
| | (-9.60) | (-6.53) | (-12.19) | (-9.64) |
| UMD | -0.19*** | -0.20*** | -0.16*** | -0.24*** |
| | (-3.54) | (-6.57) | (-3.25) | (-9.49) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 13.76*** | 16.66** |
| | (3.17) | (2.21) |
| Leader | 13.20** | 17.73*** |
| | (2.04) | (2.99) |
| **Peer** | **7.75*** | **10.79*** |
| | **(3.28)** | **(4.86)** |
| R&D growth | | 1.03*** |
| | | (2.62) |
| Ln(Size) | | -1.86** |
| | | (-2.53) |
| B/M | | 5.91*** |
| | | (3.89) |
| Negative B/M dummy | | 6.64** |
| | | (2.11) |
| PrPret | | 0.19 |
| | | (1.50) |
| Industry PrRET | | 0.08** |
| | | (2.23) |
| $R^2$ | 0.004 | 0.03 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | R&D increase event | | | | | | | | |
| | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
|---|---|---|---|---|---|---|---|---|---|
| Intercept | 7.76*** | 2.60*** | 6.01*** | 7.45*** | 2.89*** | 5.72*** | 7.13*** | 2.59*** | 5.54*** |
| | (70.88) | (17.36) | (47.10) | (75.03) | (32.49) | (65.65) | (78.89) | (14.95) | (30.69) |
| Leader | 2.68*** | 2.27** | 3.20*** | 1.55** | 5.08*** | 8.47*** | 2.36*** | 0.83 | 0.01 |
| | (3.63) | (2.05) | (3.19) | (1.96) | (4.48) | (2.83) | (4.22) | (1.41) | (0.01) |
| **Peer** | **2.42*** ** | **1.37*** ** | **1.94*** ** | **2.24*** ** | **1.19*** ** | **2.00*** ** | **2.01*** ** | **0.84*** ** | **1.68*** ** |
| | **(9.30)** | **(7.02)** | **(8.59)** | **(8.52)** | **(3.93)** | **(8.81)** | **(7.08)** | **(3.32)** | **(7.84)** |
| R&D growth | 8.58*** | 6.53*** | 10.60*** | 6.82*** | 5.10*** | 6.90*** | 6.62*** | 8.36*** | 9.44*** |
| | (7.62) | (7.75) | (7.80) | (5.90) | (2.73) | (3.59) | (5.97) | (7.64) | (6.87) |
| Ln(Size) | -3.38*** | -0.48*** | -3.08*** | -3.25*** | -0.55*** | -2.91*** | -3.15*** | -0.49*** | -2.92*** |
| | (-27.07) | (-5.37) | (-31.97) | (-23.82) | (-7.30) | (-32.10) | (-24.60) | (-4.16) | (-20.61) |
| B/M | -22.71*** | -6.44*** | -20.19*** | -19.51*** | -6.51*** | -17.40*** | -16.01*** | -5.85*** | -17.24*** |
| | (-19.92) | (-8.71) | (-15.78) | (-20.51) | (-13.22) | (-18.49) | (-20.55) | (-4.92) | (-7.23) |
| Negative B/M dummy | -4.91*** | -0.82 | 2.83 | -1.12 | 1.84 | 9.42*** | 3.90 | 0.64 | 7.92* |
| | (-3.19) | (-1.12) | (1.35) | (-0.51) | (1.24) | (2.75) | (1.10) | (0.38) | (1.95) |
| PrRET | 0.63*** | 0.08 | 0.64*** | 4.34*** | 0.11 | 3.46*** | 2.01*** | -0.90** | 1.73*** |
| | (4.34) | (1.35) | (3.38) | (3.04) | (0.42) | (3.48) | (3.62) | (-2.06) | (2.89) |
| lag OP | 34.42*** | 29.22*** | 39.15*** | 33.62*** | 49.60*** | 38.12*** | 36.19*** | 24.79*** | 40.67*** |
| | (10.44) | (9.93) | (10.08) | (5.96) | (10.14) | (11.65) | (6.48) | (10.86) | (10.46) |
| $R^2$ | 0.09 | 0.08 | 0.07 | 0.09 | 0.08 | 0.07 | 0.10 | 0.10 | 0.08 |

Table IA8: Addressing the alternative hypothesis of industry shocks: Controlling for SGA and CAPEX growth separately

We report the results of Fama-MacBeth stock returns and operating performance regressions controlling for discretionary spending growth. We include SGA growth and CAPEX growth separately in the regressions. In the stock return regression, the dependent variable is the annual stock return from July of year $t$ to June of year $t+1$. In the operating performance regression, the dependent variables are operating performance measures Sa*les growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. The explanatory variables include *leader, peer* and other control variables as in Table 3 or Table 4. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *SGA growth* is the difference in SG&A spending in years $t$ and $t–1$ divided by SG&A in year $t–1$.*CAPEX growth* is the difference in capital expenditures in years $t$ and $t–1$ divided by capital expenditures in year $t–1$. In the return regressions, the time-series $t$-statistics are reported in the parentheses. In the operating performance regressions, $t$-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

| | Stock return regressions | Operating performance regressions | | | | | | | | |
| | | Year t+1 | | | Year t+2 | | | Year t+3 | | |
| | | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
|---|---|---|---|---|---|---|---|---|---|---|
| Intercept | 13.18* | 7.64*** | 2.67*** | 6.09*** | 7.37*** | 2.88*** | 5.68*** | 7.05*** | 2.59*** | 5.51*** |
| | (1.88) | (35.41) | (8.51) | (23.28) | (37.26) | (15.46) | (31.01) | (39.43) | (7.19) | (14.03) |
| Leader | 11.88** | 3.10*** | 4.23* | 4.47** | 2.77*** | 5.55*** | 6.28 | 2.31** | 3.21*** | 3.22*** |
| | (2.08) | (2.61) | (1.72) | (2.45) | (3.21) | (3.10) | (1.34) | (2.25) | (2.75) | (2.66) |
| **Peer** | **9.75*** ** | **2.70*** ** | **1.72*** ** | **2.25*** ** | **2.47*** ** | **1.60*** ** | **2.22*** ** | **2.30*** ** | **1.37*** ** | **1.98*** ** |
| | **(4.20)** | **(5.60)** | **(4.28)** | **(5.66)** | **(5.24)** | **(3.33)** | **(6.39)** | **(4.60)** | **(3.08)** | **(4.45)** |
| SGA growth | 6.93*** | 4.88*** | 6.06*** | 8.44*** | 5.11*** | 0.16 | 2.72*** | 4.32*** | 0.58 | 1.30 |
| | (4.09) | (3.45) | (5.07) | (6.08) | (5.37) | (0.11) | (3.90) | (5.25) | (0.40) | (1.25) |
| CAPEX growth | 0.30*** | 0.08 | 0.62** | 0.46 | 0.14 | 0.18** | 0.20** | 0.20 | 0.07 | 0.01 |
| | (3.04) | (0.62) | (2.06) | (1.42) | (1.15) | (2.19) | (2.23) | (1.29) | (0.62) | (0.16) |
| Control variables as in Table 4 | Yes | | | | | | | | | |
| Control variables as in Table 5 | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.04 | 0.11 | 0.09 | 0.09 | 0.10 | 0.09 | 0.08 | 0.11 | 0.10 | 0.09 |

Table IA9: Addressing the alternative hypothesis of industry shocks: Monthly alphas to the portfolios of Leaders and Peers using the subsample of years with tax events

This table presents the alphas to the equal-weighted and value-weighted portfolios of the subsample of years experiencing the tax events (year 1981, 1982, 1987, 1993, 1994, 1996, 1997, 2007, 2009 and 2011). The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. The *t*-statistics are reported in the parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels.

|  | Equal-Weighted | | Value-Weighted | |
|  | Leaders | Peers | Leaders | Peers |
|---|---|---|---|---|
| **Alpha** | **0.65**\*\* | **0.29**\*\* | **0.50**\* | **0.22**\* |
|  | **(2.19)** | **(2.04)** | **(1.82)** | **(1.73)** |
| RMRF | 1.11\*\*\* | 0.93\*\*\* | 1.05\*\*\* | 0.96\*\*\* |
|  | (15.21) | (26.71) | (15.53) | (30.54) |
| SMB | 1.21\*\*\* | 1.10\*\*\* | 1.19\*\*\* | 0.96\*\*\* |
|  | (10.50) | (19.97) | (11.14) | (19.23) |
| HML | -0.92\*\*\* | -0.37\*\*\* | -1.11\*\*\* | -0.45\*\*\* |
|  | (-7.28) | (-6.00) | (-9.44) | (-8.12) |
| UMD | 0.17\* | 0.02 | 0.19\*\* | 0.01 |
|  | (1.66) | (0.37) | (2.06) | (0.12) |

Table IA10: Peers with high and low economic links to Leaders

Panels A and B present the Carhart four-factor alphas of equal-weighted and value-weighted portfolios of Peers with high and low economic links to the Leaders. Economic links are measured by sales growth correlation, profit margin correlation, and ROA correlation. In Panel C, the reported estimates are time-series averages of monthly cross-sectional regression coefficients. The dependent variable is the annual stock returns from July of year $t$ to June of year $t+1$. *Leader* is a dummy variable for R&D Leaders. *R&D growth* is the difference in R&D expenditures in year $t$ and $t-1$ divided by R&D expenditures in year $t-1$. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio when it is positive, and zero otherwise. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year $t$. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year $t$. *LowLinkPeer* is a dummy variable for Peers with below-median economic links to the Leaders. *HighLinkPeer* is a dummy variable for Peers with above-median economic links to the Leaders. *t*-statistics are reported in parentheses. Panel D reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year $t+1$, $t+2$ and $t+3$, respectively. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel C and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year $t$. All variables except *PrRet* are winsorized at the $1^{th}$ and $99^{th}$ percentiles. *t*-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Equal-weighted portfolios

| | Sales Growth Correlation | | | Profit Margin Correlation | | | ROA Correlation | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | High | High–Low | Low | High | High–Low | Low | High | High–Low |
| **Alpha** | **0.31\*\*** | **0.55\*\*** | **0.23\*\*** | **0.28\*\*** | **0.60\*\*\*** | **0.32\*\*\*** | **0.29\*\*** | **0.57\*\*\*** | **0.28\*\*\*** |
| | **(2.01)** | **(4,37)** | **(2.15)** | **(2.07)** | **(4.61)** | **(4.59)** | **(2.11)** | **(4.21)** | **(2.90)** |
| $R_m$-$R_f$ | 1.13\*\*\* | 1.15\*\*\* | 0.02 | 1.15\*\*\* | 1.12\*\*\* | -0.02 | 1.11\*\*\* | 1.16\*\*\* | 0.05\*\* |
| | (30.63) | (38.92) | (0.77) | (36.32) | (36.83) | (-1.49) | (34.34) | (36.28) | (2.19) |
| SMB | 1.14\*\*\* | 1.05\*\*\* | -0.10\*\*\* | 1.09\*\*\* | 1.08\*\*\* | -0.01 | 1.08\*\*\* | 1.09\*\*\* | 0.01 |
| | (22.05) | (25.20) | (-2.71) | (24.59) | (25.27) | (-0.38) | (23.98) | (24.37) | (0.18) |
| HML | -0.23\*\*\* | -0.30\*\*\* | -0.07\* | -0.24\*\*\* | -0.32\*\*\* | -0.08\*\*\* | -0.27\*\*\* | -0.29\*\*\* | -0.02 |
| | (-4.00) | (-6.43) | (-1.66) | (-4.95) | (-6.74) | (-3.01) | (-5.26) | (-5.80) | (-0.67) |
| UMD | -0.20\*\*\* | -0.24\*\*\* | -0.04 | -0.24\*\*\* | -0.22\*\*\* | 0.02 | -0.19\*\*\* | -0.25\*\*\* | -0.05\*\* |
| | (-5.49) | (-8.16) | (-1.51) | (-7.50) | (-7.13) | (1.19) | (-6.04) | (-7.77) | (-2.32) |

Panel B: Value-weighted portfolios

|  | Sales Growth Correlation | | | Profit Margin Correlation | | | ROA Correlation | | |
|---|---|---|---|---|---|---|---|---|---|
|  | Low | High | High–Low | Low | High | High–Low | Low | High | High–Low |
| **Alpha** | **0.11** | **0.42*** ** | **0.31*** ** | **0.12** | **0.46*** ** | **0.34*** ** | **0.08** | **0.44*** ** | **0.36*** ** |
|  | **(0.88)** | **(3,93)** | **(3.32)** | **(1.07)** | **(4.31)** | **(5.06)** | **(0.71)** | **(3.80)** | **(3.86)** |
| $R_m$-$R_f$ | 1.14*** | 1.16*** | 0.02 | 1.17*** | 1.13*** | -0.04*** | 1.12*** | 1.17*** | 0.05** |
|  | (38.54) | (46.21) | (0.91) | (44.43) | (44.91) | (-2.78) | (42.75) | (43.23) | (2.38) |
| SMB | 0.94*** | 0.88*** | -0.06** | 0.91*** | 0.91*** | -0.01 | 0.89*** | 0.92*** | 0.03 |
|  | (22.67) | (24.94) | (-2.03) | (24.61) | (25.71) | (-0.22) | (24.26) | (24.29) | (1.05) |
| HML | -0.33*** | -0.39*** | -0.06* | -0.33*** | -0.42*** | -0.09*** | -0.34*** | -0.39*** | -0.05 |
|  | (-7.10) | (-9.85) | (-1.70) | (-7.99) | (-10.62) | (-3.53) | (-8.27) | (-9.29) | (-1.62) |
| UMD | -0.24*** | -0.26*** | -0.02 | -0.27*** | -0.23*** | 0.04** | -0.21*** | -0.27*** | -0.06*** |
|  | (-8.11) | (-10.27) | (-0.82) | (-10.31) | (-9.29) | (2.44) | (-8.18) | (-10.16) | (-2.80) |

Panel C: Fama-MacBeth regressions of stock returns

|  | (1) Sales Growth Correlation | (2) Profit Margin Correlation | (3) ROA Correlation |
|---|---|---|---|
| Intercept | 21.33*** | 17.37*** | 13.32** |
|  | (3.38) | (3.02) | (2.11) |
| Leader | 9.14** | 11.55*** | 10.91*** |
|  | (2.53) | (3.38) | (3.20) |
| R&D growth | 0.67*** | 0.70*** | 0.70*** |
|  | (2.66) | (2.79) | (2.77) |
| Ln(Size) | -2.24*** | -1.72*** | -1.41** |
|  | (-3.89) | (-3.27) | (-2.51) |
| B/M | 5.99*** | 5.91*** | 5.38*** |
|  | (5.43) | (5.10) | (4.58) |
| Negative B/M dummy | 6.87*** | 5.01** | 4.34* |
|  | (2.82) | (2.13) | (1.75) |
| PrRET | 0.07 | 0.07 | 0.07 |
|  | (1.29) | (1.28) | (1.33) |
| Industry PrRET | 0.004 | 0.07 | -0.01 |
|  | (0.01) | (0.15) | (-0.02) |
| **LowLinkPeer** | **1.81** | **2.53** | **1.96** |
|  | **(0.92)** | **(1.25)** | **(0.97)** |
| **HighLinkPeer** | **4.79*** ** | **6.06*** ** | **5.19*** ** |
|  | **(2.67)** | **(3.24)** | **(2.80)** |
| $R^2$ | 0.05 | 0.05 | 0.05 |
| HighLinkPeer-LowLinkPeer | 2.97 | 3.53* | 3.23* |
|  | (1.60) | (1.90) | (1.70) |

Panel D: Fama-MacBeth Regressions of Operating Performance

| | Sales Growth Correlation | | | Profit Margin Correlation | | | ROA Correlation | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA | Sales Growth | Gross profit margin | ROA |
| Intercept | 5.47*** | 3.21*** | 4.14*** | 5.45*** | 3.28*** | 4.18*** | 5.66*** | 3.17*** | 4.33*** |
| | (13.01) | (13.82) | (10.86) | (12.62) | (13.13) | (10.66) | (13.15) | (13.63) | (10.46) |
| Leader | 1.48** | 3.81** | 3.32** | 2.14** | 4.79** | 3.70** | 1.95** | 4.40** | 3.45** |
| | (2.15) | (2.15) | (2.56) | (2.25) | (2.12) | (2.12) | (2.03) | (1.96) | (1.98) |
| R&D growth | 4.51*** | 9.62*** | 7.70*** | 3.26** | 9.44*** | 7.07*** | 3.23** | 9.26*** | 7.23*** |
| | (3.00) | (4.50) | (2.68) | (2.13) | (5.32) | (2.75) | (2.21) | (5.15) | (2.89) |
| Ln(Size) | -2.27*** | -0.56*** | -2.14*** | -2.32*** | -0.54*** | -2.22*** | -2.37*** | -0.42** | -2.22*** |
| | (-9.29) | (-2.84) | (-11.32) | (-9.20) | (-2.62) | (-11.06) | (-9.99) | (-2.22) | (-10.67) |
| B/M | -15.56*** | -6.84*** | -13.59*** | -15.08*** | -7.34*** | -13.87*** | -16.87*** | -7.49*** | -15.16*** |
| | (-7.06) | (-5.22) | (-6.22) | (-6.87) | (-5.30) | (-6.21) | (-7.03) | (-4.90) | (-5.89) |
| Negative B/M dummy | -0.32 | -3.13** | 4.60 | -0.23 | -2.91* | 5.38* | -1.64 | -2.21 | 5.22 |
| | (-0.16) | (-2.04) | (1.51) | (-0.11) | (-1.80) | (1.75) | (-0.86) | (-1.31) | (1.50) |
| PrRET | 2.93* | -2.27 | 1.61 | 1.61 | -1.96 | 0.85 | 1.55 | -1.51 | 1.93 |
| | (1.79) | (-1.55) | (0.67) | (1.10) | (-1.41) | (0.36) | (1.04) | (-1.02) | (0.79) |
| **LowLinkPeer** | **1.10**** | **0.66**** | **1.00**** | **0.65** | **1.15** | **0.53** | **0.81** | **1.65*** | **0.60** |
| | **(2.29)** | **(2.07)** | **(2.05)** | **(0.49)** | **(1.00)** | **(0.32)** | **(0.65)** | **(1.65)** | **(0.53)** |
| **HighLinkPeer** | **2.82**** | **2.98**** | **2.40**** | **3.05**** | **3.55**** | **2.34**** | **3.11**** | **3.17**** | **2.24**** |
| | **(3.96)** | **(4.48)** | **(3.09)** | **(3.62)** | **(3.69)** | **(2.42)** | **(3.38)** | **(3.46)** | **(1.96)** |
| Lag OP | 39.80*** | 27.65*** | 34.71*** | 41.57*** | 28.29*** | 37.18*** | 39.24*** | 28.04*** | 34.66*** |
| | (6.41) | (4.57) | (5.96) | (6.84) | (5.11) | (6.52) | (6.38) | (4.96) | (6.05) |
| $R^2$ | 0.09 | 0.09 | 0.08 | 0.10 | 0.08 | 0.09 | 0.09 | 0.10 | 0.08 |
| HighLinkPeer-LowLinkPeer | 1.72*** | 2.32*** | 1.40** | 2.40** | 2.39** | 1.82 | 2.30*** | 1.52** | 1.64* |
| | (3.43) | (4.13) | (2.34) | (2.54) | (2.09) | (1.20) | (2.81) | (2.34) | (1.94) |

Table IA11: Monthly alphas to value-weighted portfolios of Peers with high and low investor attention

The sample period is 1982-2012 for the analysis involving common analyst coverage and 1980-2012 for the analysis involving common mutual fund holdings and common institutional holdings. We present the Carhart four-factor alphas to value-weighted portfolios of Peers with low (below-median) and high (above-median) investor attention measures. Investor attention to cross-firm information is measured by common analyst coverage, common mutual fund holdings, and common institutional holdings. *t*-statistics are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

| | Common Analyst Coverage | | | Common Mutual Fund Holdings | | | Common Institutional Holdings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | High | Low−High | Low | High | Low−High | Low | High | Low−High |
| **Alpha** | **0.49*** | **0.08** | **0.41*** | **0.55*** | **0.02** | **0.53*** | **0.53*** | **0.02** | **0.51*** |
| | **(4.96)** | **(0.43)** | **(2.80)** | **(5.70)** | **(0.14)** | **(4.40)** | **(5.22)** | **(0.16)** | **(4.39)** |
| $R_m$-$R_f$ | 1.12*** | 1.29*** | -0.18*** | 1.11*** | 1.22*** | -0.11*** | 1.09*** | 1.14*** | -0.05** |
| | (47.55) | (29.58) | (-5.09) | (48.03) | (34.01) | (-3.93) | (44.72) | (32.51) | (-1.96) |
| SMB | 0.74*** | 0.98*** | -0.24*** | 0.67*** | 1.07*** | -0.40*** | 0.73*** | 1.12*** | -0.39*** |
| | (22.88) | (16.21) | (-4.94) | (20.88) | (21.40) | (-9.98) | (21.42) | (22.85) | (-10.19) |
| HML | -0.32*** | -0.94*** | 0.62*** | -0.24*** | -0.80*** | 0.56*** | -0.29*** | -0.61*** | 0.32*** |
| | (-8.56) | (-13.67) | (11.42) | (-6.52) | (-14.17) | (12.48) | (-7.66) | (-11.05) | (7.30) |
| UMD | -0.27*** | -0.32*** | 0.06 | -0.22*** | -0.31*** | 0.09*** | -0.23*** | -0.29*** | 0.06** |
| | (-11.54) | (-7.49) | (1.63) | (-9.85) | (-8.87) | (3.19) | (-9.88) | (-8.50) | (2.11) |

Table IA12: Earnings surprises to Peers with high and low investor attention

The sample period is 1982-2012 for the analysis involving common analyst coverage and 1980-2012 for the analysis involving common mutual fund holdings and common institutional holdings. We reports the results of Fama-MacBeth regressions that examine the earnings surprises and earnings announcement abnormal returns. *earnings surprise* is the difference between actual earnings and consensus analyst mean forecast divided by the stock price five days prior to the announcement date. *earnings CAR* is market-adjusted returns (differences between firm returns and returns on the value-weighted NYSE/AMEX index return) for the three days around the annual earnings announcement date. *Leader* is a dummy variable for R&D Leaders. *R&D growth* is the difference in R&D expenditures in year t and *t*–1 divided by R&D expenditures in year *t*–1. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio when it is positive, and zero otherwise. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year *t*. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year *t*. *LowAttentionPeer* is a dummy variable for Peers with low (below-median) investor attention. *HighAttentionPeer* is a dummy variable for Peers with high (above-median) investor attention. Investor attention to cross-firm information is measured by common analyst coverage, common mutual fund holdings, and common institutional holdings. *Own holdings/Analyst coverage* are the number of analysts covering the firm as June of each year, 1000 times the percentages of shares outstanding owned by active mutual funds, and 1000 times the percentages of shares outstanding owned by institutional investors, depending on the investor attention measure used. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

| | Common Analyst Coverage | | Common Mutual Fund Holdings | | Common Institutional Holdings | |
|---|---|---|---|---|---|---|
| | Earnings Surprise | Earnings CAR | Earnings Surprise | Earnings CAR | Earnings Surprise | Earnings CAR |
| Intercept | 0.54*** | -0.07 | 0.53*** | 0.28** | 0.51*** | 0.17 |
| | (6.52) | (-0.48) | (8.64) | (2.18) | (8.02) | (1.58) |
| Leader | 0.14* | 0.61*** | 0.23*** | 0.60*** | 0.20*** | 0.65*** |
| | (1.75) | (3.21) | (3.03) | (3.26) | (2.61) | (3.48) |
| R&D growth | 0.04 | 0.05 | 0.07** | 0.05 | 0.07*** | 0.04 |
| | (1.39) | (0.68) | (2.23) | (0.84) | (3.10) | (0.53) |
| Ln(Size) | -0.001 | -0.03 | -0.01 | -0.04*** | -0.02 | -0.06*** |
| | (-0.14) | (-1.17) | (-1.13) | (-2.67) | (-1.42) | (-3.60) |
| B/M | -0.70*** | -0.25*** | -0.68*** | -0.20*** | -0.69*** | -0.26*** |
| | (-11.68) | (-4.83) | (-11.91) | (-3.63) | (-12.24) | (-4.38) |
| Negative B/M dummy | 0.83 | -0.73** | 1.04** | -0.62* | 1.04** | -0.64** |
| | (1.59) | (-2.13) | (2.07) | (-1.93) | (2.06) | (-1.98) |
| PrRET | -0.002 | 0.01 | -0.01 | 0.05 | 0.002 | 0.02 |
| | (-0.92) | (0.92) | (-1.52) | (0.07) | (0.57) | (1.17) |
| Industry PrRET | 0.02*** | 0.02* | 0.02*** | 0.03*** | 0.02*** | 0.02** |
| | (3.11) | (1.80) | (3.67) | (2.63) | (3.56) | (2.09) |
| **LowAttentionPeer** | **0.12*** | **0.41*** | **0.11** | **0.18** | **0.11*** | **0.28*** |
| | **(2.92)** | **(3.71)** | **(2.51)** | **(2.18)** | **(2.89)** | **(4.25)** |
| **HighAttentionPeer** | **0.04** | **0.13** | **-0.01** | **-0.02** | **0.01** | **0.06** |
| | **(0.91)** | **(1.13)** | **(-0.30)** | **(-0.31)** | **(0.35)** | **(0.78)** |
| Own holdings /Analyst coverage | -0.01 | 0.01 | 0.001* | -0.02 | 0.02* | 0.01 |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  | (-0.02) | (0.74) | (1.94) | (-0.35) | (1.79) | (0.50) |
| $R^2$ | 0.29 | 0.19 | 0.27 | 0.17 | 0.25 | 0.23 |
| Diff Test: low-high attention | 0.08* | 0.28* | 0.12** | 0.20** | 0.10** | 0.22*** |
|  | (1.64) | (1.85) | (2.40) | (1.99) | (2.26) | (2.67) |

Table IA13: Stock returns and operating performance to Leaders and Peers during the identification years

We perform stock return and operating performance regressions during the identification year (i.e., t=0 period). Panel A presents the alphas to the equal-weighted and value-weighted portfolios of R&D Leaders and Peers. The alphas are estimated using the Carhart four-factor model. RMRF, SMB, HML, and UMD are the excess market return, the size, book-to-market, and momentum factors. Panel B reports the results of Fama-MacBeth regressions that examine the stock returns to the R&D Leaders, Peers, and non-event firms. The dependent variable is the annual stock return from July of year *t-1* to June of year *t*. The explanatory variables include the following. *Leader* is a dummy variable for R&D Leaders. *Peer* is a dummy variable for the Peers. *R&D growth* is the difference in R&D expenditures in year t and *t–1* divided by R&D expenditures in year *t–1*. *Ln(Size)* is the log of market capitalization. *B/M* is the book-to-market ratio. *Negative B/M dummy* is a dummy variable that equals one if the book-to-market ratio is negative. *PrRET* is the average monthly return during the past 11 months ending in May of year *t*. *Industry PrRET* is the average value-weighted industry returns in the past 11 months ending in May of year *t*. Stock returns, *PrRet*, and *Industry PrRet* are expressed in percentage points. The reported estimates are the time-series averages of monthly cross-sectional regression coefficients. The time-series *t*-statistics are reported in the parentheses. Panel C reports the results of Fama-MacBeth regressions that examine the operating performance of R&D Leaders, Peers, and non-event firms. The dependent variables are operating performance measures *Sales growth, Gross profit margin,* and *ROA* for year *t*. These measures are expressed in percentage points. The explanatory variables include the variables defined in Panel B and *Lag OP*. *Lag OP* is the lagged operating performance measures (*Sales growth, Gross profit margin,* and *ROA*) for year *t*. All variables except *PrRet* are winsorized at the $1^{th}$ and $99^{th}$ percentiles. *t*-statistics reported in parentheses are computed using the Newey-West procedure with a lag of three years. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is 1975-2012.

Panel A: Monthly Alphas to the Portfolios of Leaders and Peers

|  | Equal-Weighted | | Value-Weighted | |
|---|---|---|---|---|
|  | Leaders | Peers | Leaders | Peers |
| **Alpha** | **0.39** | **0.28** | **0.33** | **0.22** |
|  | **(1.52)** | **(1.26)** | **(1.37)** | **(1.02)** |
| RMRF | 0.68*** | 1.22*** | 0.71*** | 1.28*** |
|  | (11.04) | (22.85) | (12.17) | (24.84) |
| SMB | 0.76*** | 1.32*** | 0.60*** | 1.22*** |
|  | (8.88) | (17.68) | (7.34) | (16.93) |
| HML | -0.65*** | -0.92*** | -0.64*** | -1.02*** |
|  | (-6.65) | (-10.79) | (-6.90) | (-12.43) |
| UMD | -0.18*** | -0.43*** | -0.23*** | -0.44*** |
|  | (-3.03) | (-8.30) | (-4.02) | (-8.74) |

Panel B: Fama-MacBeth Regressions of Stock Returns

| | (1) | (2) |
|---|---|---|
| Intercept | 15.02*** | 19.24*** |
| | (3.64) | (2.91) |
| Leader | 4.41 | 5.06 |
| | (1.21) | (1.63) |
| **Peer** | **2.28** | **1.65** |
| | **(1.36)** | **(1.17)** |
| R&D growth | | 0.27 |
| | | (1.11) |
| Ln(Size) | | -1.61*** |
| | | (-2.80) |
| B/M | | 3.03*** |
| | | (2.77) |
| Negative B/M dummy | | 1.50 |
| | | (0.67) |
| PrPret | | 0.00 |
| | | (1.62) |
| Industry PrRET | | -0.26 |
| | | (-0.54) |
| $R^2$ | 0.003 | 0.05 |

Panel C: Fama-MacBeth Regressions of Operating Performance

| | Year t=0 | | |
| --- | --- | --- | --- |
| | Sales Growth | Gross profit margin | ROA |
| Intercept | 5.68*** | 5.09*** | 5.21*** |
| | (13.71) | (16.23) | (15.23) |
| Leader | 3.24 | 2.31 | 1.37 |
| | (1.30) | (1.03) | (0.51) |
| **Peer** | **1.40** | **1.33** | **1.33** |
| | **(1.33)** | **(1.25)** | **(1.11)** |
| R&D growth | 1.86 | 0.30 | 1.21 |
| | (1.44) | (0.19) | (0.65) |
| Ln(Size) | -2.35*** | -2.11*** | -2.22*** |
| | (-9.74) | (-8.33) | (-8.72) |
| B/M | -17.15*** | -11.24*** | -9.54*** |
| | (-7.18) | (-7.29) | (-6.28) |
| Negative B/M dummy | -2.40 | 4.27 | 0.77 |
| | (-1.52) | (0.96) | (0.43) |
| PrRET | 0.47* | 0.10 | 0.96** |
| | (1.70) | (1.40) | (2.06) |
| lag OP | 37.92*** | 38.01*** | 33.62*** |
| | (6.52) | (8.22) | (6.19) |
| $R^2$ | 0.09 | 0.08 | 0.07 |