**Sales Force Downsizing and Firm-Idiosyncratic Risk:**

**The Contingent Role of Investors’ Screening and Firm’s Signaling Processes**

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**­­­­Web Appendix**

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*WEB APPENDIX 1:**BACKGROUND LITERATURE*

**TABLE 1.1: Overview of Empirical Research on the Influence of Downsizing on Marketing Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors (Year)** | **Sales Force**  **Focus** | **Financial-Market Performance** | **Cross-Industry** | **B2B** | **B2C** | **Secondary**  **Data** | **Longitudinal Data** | **Investor Evaluation Moderators** | **Firm-Controlled Moderators** | **Relevant Findings** |
| *Habel and Klarmann (2015)* | — | — | ✓ | — | ✓ | ✓ | ✓ | — | ✓ | Downsizing decreases firm customer satisfaction, mediating a decrease in firm financial performance (return on assets). |
|  |  |  |  |  |  |  |  |  |  |  |
| *Homburg, Klarmann, and Staritz (2012)* | ✓ | — | ✓ | ✓ | — | ✓ | — | — | ✓ | Customer-contact employee downsizing increases customer uncertainty, which is negatively associated with perceived customer satisfaction and firm performance. |
|  |  |  |  |  |  |  |  |  |  |  |
| *Lewin (2009)* | ✓\* | — | ✓ | ✓ | — | — | — | — | — | Downsized suppliers have lower customer perceptions of quality and value. |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| *McElroy, Morrow, and Rude (2001)* | — | — | — | — | ✓ | — | — | — | — | A reduction-in-force has more detrimental effects on subunit customer satisfaction than voluntary or involuntary turnover. |
|  |  |  |  |  |  |  |  |  |  |  |
| *Subramony and Holtom (2012)* | — | — | — | ✓ | — | — | — | — | — | Downsizing service employees has a negative impact on perceived service brand image and future unit profitability. |
|  |  |  |  |  |  |  |  |  |  |  |
| *Wagar (1998)* | — | — | ✓ | ✓ | — | — | — | — | — | Downsizing service employees reduces customer satisfaction and service quality. |
|  |  |  |  |  |  |  |  |  |  |  |
| *Williams, Khan, and Naumann (2011)* | — | — | — | ✓ | — | — | — | — | — | Downsizing events lower average customer satisfaction scores for a single firm. |
|  |  |  |  |  |  |  |  |  |  |  |
| ***This Article*** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Size of firm’s sales force downsizing increases firm-idiosyncratic risk. The relationship is strengthened by a firm’s product market fluidity and a firm’s accruals management, but these moderating effects are alleviated by a firm’s advertising intensity and CEO external focus, respectively. |

Notes: ✓ applicable in the study; — not applicable in the study; ✓\* applicable but sales force is mixed with customer-service employees in the study.

**Additional References to Web Appendix 1:**

Lewin, Jeffrey E. (2009), “Business Customers' Satisfaction: What Happens When Suppliers Downsize?” *Industrial Marketing Management*, 38(3), 283-299.

McElroy, James C., Paula C. Morrow, and Scott N. Rude (2001), “Turnover and Organizational Performance: A Comparative Analysis of the Effects of Voluntary, Involuntary, and Reduction-in-Force Turnover,” *Journal of Applied Psychology*, 86(6), 1294.

Subramony, Mahesh and Brooks C. Holtom (2012), “The Long-Term Influence of Service Employee Attrition on Customer Outcomes and Profits,” *Journal of Service Research*, 15(4), 460-73.

Wagar, Terry H. (1998), “Exploring the Consequences of Workforce Reduction,” *Canadian Journal of Administrative Science*, 15 (4), 300–9.

Williams, Paul M., Sajid Khan, and Earl Naumann (2011), “Customer Dissatisfaction and Defection: The Hidden Costs of Downsizing,” *Industrial Marketing Management*, 40(3), 405-13.

*WEB APPENDIX 2:**SAMPLE COMPOSITION*

**Table 2.1: Sample Composition**

|  |  |
| --- | --- |
|  | **%** |
| **Industries (2-digit SIC)** |  |
| (20) Food & Kindred Products | 5.70 |
| (21) Tobacco Products | .60 |
| (22) Textile Mill Products | .64 |
| (23) Apparel & Other Textile Products | .89 |
| (24) Lumber & Wood Products | .21 |
| (25) Furniture & Fixtures | 1.19 |
| (26) Paper & Allied Products | 1.92 |
| (27) Printing & Publishing | 2.72 |
| (28) Chemical & Allied Products | 14.05 |
| (30) Rubber & Miscellaneous Plastics Products | .47 |
| (32) Stone, Clay, & Glass Products | 1.70 |
| (33) Primary Metal Industries | .47 |
| (34) Fabricated Metal Products | .72 |
| (35) Industrial Machinery & Equipment | 1.87 |
| (36) Electronic & Other Electric Equipment | 7.15 |
| (37) Transportation Equipment | 6.51 |
| (38) Instruments & Related Products | 3.41 |
| (40) Railroad Transportation | 6.94 |
| (42) Trucking & Warehousing | .47 |
| (45) Transportation by Air | 1.49 |
| (47) Transportation Services | 2.60 |
| (48) Communications | .64 |
| (49) Electric, Gas, & Sanitary Services | 4.38 |
| (50) Wholesale Trade - Durable Goods | .94 |
| (51) Wholesale Trade - Nondurable Goods | 8.05 |
| (52) Building Materials & Gardening Supplies | 1.62 |
| (59) Miscellaneous Retail | .21 |
| (60) Depository Institutions | .43 |
| (63) Insurance Carriers | .09 |
| (64) Insurance Agents, Brokers, & Service | .26 |
| (70) Hotels & Other Lodging Places | .51 |
| (72) Personal Services | .64 |
| (73) Business Services | 18.18 |
| (82) Educational Services | .60 |
| (87) Engineering & Management Services | 1.45 |
| (99) Non-Classifiable Establishments | .30 |
|  |  |
| **Total Revenues** |  |
| <$500 million | 5.54 |
| $500 million – $1,000 million | 8.91 |
| $1,001 million - $5,000 million | 41.02 |
| $5,001 million - $10,000 million | 14.63 |
| >$10,000 million | 29.90 |
| **Number of Employees** |  |
| <2,000 | 8.30 |
| 2,001 – 5,000 | 20.22 |
| 5,001 – 10,000 | 24.29 |
| 10,001 – 25,000 | 25.40 |
| >25,000 | 21.78 |

*WEB APPENDIX 3: KEYWORDS CONTAINED IN THE DICTIONARY EMPLOYED TO MEASURE CEO EXTERNAL FOCUS*

|  |  |  |
| --- | --- | --- |
| Customer |  | Competitiveness |
| Customers |  | Competitor |
| Consumer |  | Competitors |
| Consumers |  | Compete |
| Buyer |  | Competition |
| Buyers |  | Peer |
| Market |  | Peers |
| Markets |  | Companies |
| Market-place |  | Firms |
| Marketplace |  | Position |
| Communities |  | Positioning |
| Competitive |  | Positioned |

*WEB APPENDIX 4: SUMMARY STATISTICS*

**Table 4.1: Summary Statistics of Study Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Observations** | **Mean** | **SD** | **Min** | **Max** |
| FIR | 2,267 | 1.937 | 1.141 | .649 | 6.959 |
| FSFS | 2,349 | 2,872.020 | 4,846.002 | 500 | 40,000 |
| SFSFDSP | 2,349 | 1.073 | 6.533 | .000 | 90.000 |
| SFSFDAR/10-Ks | 2,314 | .485 | 3.118 | .000 | 25.147 |
| FPMF | 2,164 | 6.290 | 3.364 | 1.074 | 18.990 |
| FAM | 2,349 | 1.613 | 2.673 | .000 | 46.794 |
| EXT | 2,194 | 5.765 | 2.598 | .514 | 19.185 |
| ADV | 2,349 | .012 | .025 | .000 | .112 |
| R&D | 2,349 | .049 | .072 | .000 | .312 |
| ROA | 2,349 | .104 | .079 | -.164 | .344 |
| LEV | 2,349 | .598 | .237 | .149 | 1.432 |
| LIQ | 2,349 | 1.861 | .957 | .517 | 6.791 |
| SIZE | 2,349 | 8.556 | 1.598 | 4.911 | 12.527 |
| IVOLAT | 2,349 | .115 | .107 | .007 | .510 |
| IGROW | 2,349 | .059 | .168 | -.489 | 1.188 |
| IMSSFD | 2,349 | .031 | .056 | .000 | .900 |
| ISFSD | 2,349 | .742 | .124 | .405 | 1.000 |

Notes: FIR = firm-idiosyncratic risk (%); FSFS = firm’s sales force size (number of salespeople); SFSFDSP = size of firm’s sales force downsizing from Selling Power (%); SFSFDAR/10-Ks = size of firm’s sales force downsizing from Annual Reports/10-Ks (%); FPMF = firm’s product market fluidity; FAM = firm’s accruals management; EXT = CEO external focus; ADV = firm’s advertising intensity; R&D = firm’s research & development expenditures to firm’s sales; ROA = firm’s return on assets; LEV = firm’s financial leverage; LIQ = firm’s available liquidity; SIZE = firm size; IVOLAT = industry volatility; IGROW = industry growth; IMSSFD = industry’s mean size of sales force downsizing; ISFSD = industry sales force size disclosure.

*WEB APPENDIX 5: MULTICOLLINEARITY TEST – VARIANCE INFLATION FACTORS*

Variance inflation factor (VIF) provides an index that measures how much the variance of an estimated regression coefficient is increased compared to when the explanatory variables are not linearly related. All measures in Table 5.1 display a VIF close to 1, well below the threshold value of 10 (Hair et al. 2010), thus indicating no multicollinearity issues.

**Table 5.1: Variance Inflation Factors**

|  |  |  |
| --- | --- | --- |
| **Variable** | **VIF** | **R-Squared** |
| SFSFDSP | 1.040 | .036 |
| SFSFDAR/10-Ks | 1.060 | .056 |
| FPMF | 1.480 | .326 |
| FAM | 1.090 | .084 |
| EXT | 1.040 | .043 |
| ADV | 1.070 | .062 |
| R&D | 1.510 | .338 |
| ROA | 1.100 | .094 |
| LEV | 1.620 | .382 |
| LIQ | 1.610 | .377 |
| SIZE | 1.240 | .196 |
| IVOLAT | 1.340 | .253 |
| IGROW | 1.020 | .017 |
| IMSSFD | 1.050 | .048 |
| ISFSD | 1.090 | .084 |

Notes: SFSFDSP = size of firm’s sales force downsizing from Selling Power (%); SFSFDAR/10-Ks = size of firm’s sales force downsizing from Annual Reports/10-Ks (%); FPMF = firm’s product market fluidity; FAM = firm’s accruals management; EXT = CEO external focus; ADV = firm’s advertising intensity; R&D = firm’s research & development expenditures to firm’s sales; ROA = firm’s return on assets; LEV = firm’s financial leverage; LIQ = firm’s available liquidity; SIZE = firm size; IVOLAT = industry volatility; IGROW = industry growth; IMSSFD = industry’s mean size of sales force downsizing; ISFSD = industry sales force size disclosure.

**Additional References to Web Appendix 5:**

Hair, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson (2010). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

*WEB APPENDIX 6: RESULTS FROM THE AUXILIARY REGRESSIONS*

**TABLE 6.1: Results from the Auxiliary Regressions a**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Heckman selection model b** | | **Control function model c** | |
| R&D | 1.189\*\*\* | (.285) | -1.050 | (1.700) |
| R&D\_i | .210\*\*\* | (.040) | –.027 | (.263) |
| ROA | –4.902\*\*\* | (.204) | –4.728\*\*\* | (1.221) |
| LEV | 1.011\*\*\* | (.092) | –.071 | (.558) |
| LIQ | .071\*\*\* | (.020) | .211\* | (.126) |
| SIZE | –.250\*\*\* | (.011) | –.253 | (.077) |
| IVOLAT | –1.167\*\*\* | (.171) | –.766 | (1.414) |
| IGROW | –.043 | (.101) | –.747 | (.625) |
| ISFSD | 4.659\*\*\* | (.106) |  |  |
| IMSSFD |  |  | 2.187\*\* | (1.084) |
| IMR |  |  | .558\*\* | (.244) |
| Constant | 4.519\*\*\* | (.140) | .095 | (.844) |
| Year effects | Yes | | Yes | |
| Observations | 4,377 | | 2,340 | |

\*\*\*p < .01, \*\*p < .05, \*p < .10. Two-tailed significance tests are used.

a First entry within each cell corresponds to estimated coefficients followed by robust standard errors in parentheses.

b Heckman selection model using the exogenous controls as well as the exclusion variable of industry’s percentage of firms disclosing their sales force size.

c Control function model of endogenous sales force downsizing, using the instrument of industry’s mean size of sales force downsizing and the exogenous controls.

Notes: R&D = firm’s research & development expenditures to firm’s sales; R&D\_i = firm’s research & development dummy; ROA = firm’s return on assets; LEV = firm’s financial leverage; LIQ = firm’s available liquidity; SIZE = firm size; IVOLAT = industry volatility; IGROW = industry growth; ISFSD = industry sales force size disclosure; IMSSFD = industry’s mean size of sales force downsizing; IMR = Inverse Mills ratio estimated using Heckman’s selection model.

*WEB APPENDIX 7: ROBUSTNESS CHECK: TREATMENT EFFECTS USING MATCHED METHOD*

We estimate the counterfactual event – that is, what would have happened to the firm-idiosyncratic risk of a downsizing firm, if the firm did not downsize its sales force. In the absence of a randomized experiment, we employ the nearest-neighbor matching procedure including the bias-corrected matching estimator (Abadie and Imbens 2002). In particular, for every firm that downsized its sales force (treatment group) we found a matching firm that didn’t downsize in the same year (control group). Matching of firms was done using the following covariates: year, firm’s sales force size before the change, firm’s R&D expenditures, firm’s profitability, firm’s financial leverage, firm’s liquidity, firm’s size, and industry growth. The average effect of sales force downsizing on firm-idiosyncratic risk is constructed by averaging the covariate-specific treatment-control contrasts, and then reweighting these contrasts using the distribution of the covariates of the treated. By averaging the covariate-specific contrasts between the firms that downsized their sales force and their peers that did not downsize their sales force, we are able to estimate the causal effect of sales force downsizing on firm-idiosyncratic risk.

We first run the matched method procedure using all firm-year observations where there is downsizing of any size in the sales force. Results from this analysis (see first row, Model 1 in Table 7.1 below) show that the difference in the risk between treated and control groups is positive and statistically significant, thus confirming our finding that the size of a firm’s sales force downsizing conveys a distinct signal to investors that increases a firm’s stock risk. Specifically, results show that firms that downsized their sales force increased idiosyncratic risk, on average, by .459% compared to if the same firms elected not to downsize the sales force.

Next, we repeated the analysis of matching firms by sequentially adding the lagged firm-idiosyncratic risk as a covariate (see first row, Model 2 in Table 7.1). Again, the results confirm our hypothesis testing results for our main effect.

Finally, we assessed the extent to which our results hold under different thresholds of sales force downsizing. Specifically, we use those firm-year observations where there is (i) downsizing of at least 5% of the sales force (see second row, Models 1 and 2 in Table 7.1); and (ii) downsizing of at least 50 salespeople (see third row, Models 1 and 2 in Table 7.1). For example, if we focus on the firms that cut more than 50 salespeople, the effect on idiosyncratic risk increases to .520%, about half of the sample’s standard deviation of firm idiosyncratic risk. Because the “at least 50 salespeople” threshold is aligned with the definition of a mass layoff used by the U.S. Department of Labor (2018), we conclude that the evidence offered here provides a strong indication on the robustness of our results.

**Table 7.1: Matched Method Resultsa,b,c**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Model 1 d** | | **Model 2 e** | |
|  |  |  |  |  |
| Difference between Treated (all downsized sales force) and Untreated (no downsized sales force) Firms | .459\*\*\* | (.116) | .239\*\* | (.112) |
|  |  |  |  |
|  |  |  |  |  |
| Observations | 2,222 | | 2,009 | |
|  |  |  |  |  |
| Difference between Treated (downsized by more than 5% of sales force) and Untreated (no downsized sales force) Firms | .489\*\*\* | (.138) | .279\*\* | (.135) |
|  |  |  |  |
|  |  |  |  |  |
| Observations | 2,222 | | 2,009 | |
|  |  |  |  |  |
| Difference between Treated (downsized by more than 50 salespeople) and Untreated (no downsized sales force) Firms | .520\*\*\* | (.118) | .240\* | (.132) |
|  |  |  |  |
|  |  |  |  |  |
| Observations | 2,204 | | 1,997 | |

\*\*\**p*<.01, \*\**p*<.05, \**p*<.10. Two-tailed significance tests are used.

a Group of Treated (i.e., firms that downsized their sales force) matched with Group of Controls (i.e., firms that didn’t downsize their sales force).

b First entry within each cell corresponds to estimated coefficients followed by robust standard errors in parentheses.

c Dependent variable is firm-idiosyncratic risk. Set of treated firms includes firms with (i) downsizing of any size in the sales force, (ii) more than 5% of the sales force downsized (iii) more than 50 salespeople downsized.

d Firms are matched based on year, firm’s sales force size before the change, firm’s R&D expenditures, firm’s profitability, firm’s financial leverage, firm’s liquidity, firm’s size, and industry growth.

e Firms are matched with the same variables included in Model 1 as well as lagged firm-idiosyncratic risk.

**Additional References to Web Appendix 7:**

Abadie, Alberto and Guido W. Imbens (2002), “Simple and Bias-corrected Matching Estimators for Average Treatment Effects,” NBER Technical Working Paper No. 283, National Bureau of Economic Research.

U.S. Department of Labor (2018), “Mass Layoff Statistics,” (accessed July 4, 2018), [available at <https://www.bls.gov/mls/>].

*WEB APPENDIX 8: ROBUSTNESS CHECKS: FIRM RANDOM EFFECTS AND TOTAL STOCK RISK*

First, to assess the extent to which our original specification including fixed effects was appropriate, we tested a firm random effects Generalized Least Squares panel regression specification, including industry fixed effects. The estimated slopes of this alternative model specification confirm our findings for all hypotheses (see Model 1, Table 8.1).

Second, the estimated firm-idiosyncratic risk is derived using the four-factor model. This may introduce some model error bias to our results. Therefore, we tested our hypotheses using firm’s total stock risk (i.e., the annual standard deviation of firm daily stock returns). Because total risk is a descriptive statistic, it is free of any model error bias. The results were robust to the alternative firm’s stock risk variable (see Model 2, Table 8.1).

**Table 8.1: Robustness Checksa**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Main Variables** | **Model 1 b** | |  | **Model 2 c** | | |
| SFSFDSP | .071\*\* | (.030) |  | .058\* | (.032) |
| FPMF | .038\*\*\* | (.014) |  | .056\*\*\* | (.016) |
| SFSFDSP × FPMF | .072\*\*\* | (.019) |  | .082\*\*\* | (.024) |
| ADV | .068\*\*\* | (.020) |  | .186\*\*\* | (.041) |
| SFSFDSP × ADV | .032 | (.043) |  | .027 | (.036) |
| FPMF ×ADV | –.007 | (.011) |  | –.003 | (.013) |
| SFSFDSP × FPMF × ADV | –.115\*\*\* | (.029) |  | –.102\*\*\* | (.033) |
| FAM | .133\*\*\* | (.026) |  | .136\*\*\* | (.032) |
| SFSFDSP × FAM | .150\*\*\* | (.021) |  | .149\*\*\* | (.027) |
| EXT | .009 | (.012) |  | .008 | (.015) |
| SFSFDSP × EXT | .032\*\* | (.016) |  | .016 | (.018) |
| FAM × EXT | .032 | (.025) |  | .026 | (.031) |
| SFSFDSP × FAM × EXT | –.098\*\*\* | (.025) |  | –.109\*\*\* | (.040) |
| **Covariates** |  |  |  |  |  |
| R&D | .215 | (.399) |  | –2.077\*\*\* | (.687) |
| R&D\_i | –.017 | (.050) |  | –.175 | (.120) |
| ADV\_i | .087\* | (.045) |  | .194\*\* | (.086) |
| ROA | –3.865\*\*\* | (.239) |  | –3.353\*\*\* | (.357) |
| LEV | .513\*\*\* | (.127) |  | .440\*\* | (.215) |
| LIQ | –.022 | (.020) |  | –.109\*\*\* | (.027) |
| SIZE | –.287\*\*\* | (.015) |  | –.236\*\*\* | (.054) |
| IVOLAT | –.765\*\*\* | (.148) |  | –.120 | (.278) |
| IGROW | –.060 | (.054) |  | –.073 | (.067) |
| CF | .040\*\*\* | (.014) |  | .046\*\*\* | (.016) |
| IMR | .230 | (.161) |  | .022 | (.171) |
| Constant | 4.673\*\*\* | (.170) |  | 5.376\*\*\* | (.478) |
| Firm random effects | Yes | |  | - | |
| Firm fixed effects | - | |  | Yes | |
| Industry effects | Yes | |  | - | |
| Year effects | Yes | |  | Yes | |
| Observations | 2,338 | |  | 2,338 | |
| R-squared | - | |  | .515 | |
| Adjusted R-squared | - | |  | .507 | |

\*\*\* *p* < .01, \*\* *p* < .05, \* *p* < .10. Two-tailed significance tests are used.

a First entry within each cell corresponds to estimated coefficients followed by robust standard errors in parentheses.

b GLS random-effects estimator with industry fixed effects.

c OLS fixed effects estimator using as dependent variable the firm’s stock total risk.

Notes: SFSFDSP = size of firm’s sales force downsizing from Selling Power (%); FPMF = firm’s product market fluidity; ADV = firm’s advertising intensity; FAM = firm’s accruals management; EXT = CEO external focus; R&D = firm’s research & development expenditures to firm’s sales; R&D\_i = firm’s research & development dummy; ADV\_i = firm’s advertising dummy; ROA = firm’s return on assets; LEV = firm’s financial leverage; LIQ = firm’s available liquidity; SIZE = firm size; IVOLAT = industry volatility; IGROW = industry growth; CF = residual term of control function model; IMR = Inverse Mills ratio estimated using Heckman’s selection model.

*WEB APPENDIX 9: EFFECTS OF SALES FORCE UPSIZING AND DOWNSIZING*

First, we empirically test whether the effect of the size of a firm’s sales force upsizing on firm-idiosyncratic risk is equivalent (i.e., symmetric) or distinct (i.e., asymmetric) from the signal of sales force downsizing. The results of this analysis are shown in the complete model (Model 3) in Table 9.1 below. By applying the F-test on the main effects of upsizing and downsizing, we reject the hypothesis of asymmetric effects in favor of symmetric effects (p-value = .45). In other words, we find that the size of a firm’s sales force upsizing and downsizing have statistically equivalent effects on firm-idiosyncratic risk. However, upsizing appears to be influenced by different boundary conditions compared to those related to sales force downsizing, as none of the two-way and three-way interactions of sales force upsizing were significant (see Model 3).

Second, we examine the full range of the sizing measure in a continuous variable construct – that is, the size of sales force change (%). To test for the curvilinear relationship indicated by previous spline regression findings, we model the linear and quadratic effect of the size of firm’s sales force change. The results show that the linear effect of the size of firm’s sales force change on firm-idiosyncratic risk is negative and significant (γlinear = –.063, *p* < .01) while the quadratic effect of the size of firm’s sales force change on firm-idiosyncratic risk is positive and significant (γquadratic = .021, *p* < .01) (see Model 4, Table 9.1 below) in support of a U-shaped relationship.

Together, these findings suggest that upsizing a firm’s sales force increases investors’ uncertainty and, thus, firm-idiosyncratic risk, because of the unpredictability of future cash flows, albeit via different mechanisms than those related to sales force downsizing.

**Table 9.1: Effects of Size of Firm’s Sales Force Upsizing and Downsizing a, b, c**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Main Variables** | **Model 1:**  **Main Effects** | | **Model 2:**  **Two-Way**  **Interactions** | | **Model 3:**  **Three-Way**  **Interactions** | | | **Model 4:**  **Linear and**  **Quadratic**  **Main Effects** | |
| SFSFDSP | .083\*\*\* | (.012) | .079\*\*\* | (.012) | .072\*\*\* | (.020) |  | |  |
| FPMF |  |  | .040\*\*\* | (.013) | .038\*\*\* | (.013) |  | |  |
| SFSFDSP × FPMF |  |  | .052\*\*\* | (.013) | .047\*\*\* | (.016) |  | |  |
| ADV |  |  |  |  | .138\*\*\* | (.040) |  | |  |
| SFSFDSP × ADV |  |  |  |  | .014 | (.038) |  | |  |
| FPMF ×ADV |  |  |  |  | –.003 | (.012) |  | |  |
| SFSFDSP × FPMF × ADV |  |  |  |  | –.058\*\*\* | (.021) |  | |  |
| FAM |  |  | .103\*\*\* | (.029) | .092\*\*\* | (.029) |  | |  |
| SFSFDSP × FAM |  |  | .055\*\*\* | (.020) | .075\*\*\* | (.019) |  | |  |
| EXT |  |  |  |  | .007 | (.013) |  | |  |
| SFSFDSP × EXT |  |  |  |  | .022 | (.014) |  | |  |
| FAM × EXT |  |  |  |  | .044 | (.028) |  | |  |
| SFSFDSP × FAM × EXT |  |  |  |  | –.047\* | (.025) |  | |  |
| SFSFUSP | .053\*\*\* | (.013) | .054\*\*\* | (.013) | .050\*\*\* | (.014) |  | |  |
| SFSFUSP × FPMF |  |  | .029\*\* | (.012) | .020 | (.014) |  | |  |
| SFSFUSP × ADV |  |  |  |  | .003 | (.024) |  | |  |
| SFSFUSP × FPMF × ADV |  |  |  |  | –.033 | (.029) |  | |  |
| SFSFUSP × FAM |  |  | .009 | (.019) | –.022 | (.019) |  | |  |
| SFSFUSP × EXT |  |  |  |  | –.008 | (.015) |  | |  |
| SFSFUSP × FAM × EXT |  |  |  |  | –.022 | (.032) |  | |  |
| SSFC |  |  |  |  |  |  | –.063\*\*\* | | (.012) |
| QSSFC |  |  |  |  |  |  | .021\*\*\* | | (.003) |
| **Covariates** |  |  |  |  |  |  |  | |  |
| R&D | –1.861\*\*\* | (.540) | –2.208\*\*\* | (.572) | –2.156\*\*\* | (.606) | –1.897\*\*\* | | (.541) |
| R&D\_i | –.206\*\* | (.099) | –.283\*\*\* | (.104) | –.261\*\* | (.107) | –.208\*\* | | (.098) |
| ADV\_i |  |  |  |  | .170\*\* | (.072) |  | |  |
| ROA | –3.419\*\*\* | (.327) | –3.413\*\*\* | (.319) | –3.165\*\*\* | (.334) | –3.442\*\*\* | | (.325) |
| LEV | .675\*\*\* | (.199) | .581\*\*\* | (.176) | .529\*\*\* | (.183) | .677\*\*\* | | (.198) |
| LIQ | –.076\*\*\* | (.021) | –.089\*\*\* | (.022) | –.086\*\*\* | (.022) | –.075\*\*\* | | (.021) |
| SIZE | –.197\*\*\* | (.046) | –.194\*\*\* | (.047) | –.200\*\*\* | (.049) | –.201\*\*\* | | (.046) |
| IVOLAT | .184 | (.237) | .000 | (.233) | –.134 | (.234) | .181 | | (.238) |
| IGROW | –.012 | (.053) | –.005 | (.051) | –.002 | (.055) | –.009 | | (.052) |
| CF | –.020\* | (.012) | –.019 | (.012) | –.015 | (.012) | –.006 | | (.011) |
| IMR | .427\*\*\* | (.127) | .223\* | (.131) | .161 | (.139) | .436\*\*\* | | (.126) |
| Constant | 4.324\*\*\* | (.405) | 4.459\*\*\* | (.408) | 4.437\*\*\* | (.418) | 4.343\*\*\* | | (.405) |
| Firms fixed effects | Yes | | Yes | | Yes | | | Yes | |
| Year effects | Yes | | Yes | | Yes | | | Yes | |
| Observations | 2,410 | | 2,410 | | 2,410 | | 2,410 | | |
| R-squared | .380 | | .397 | | .410 | | .382 | | |
| Adjusted R-squared | .375 | | .389 | | .399 | | .376 | | |

\*\*\**p*<.01, \*\**p*<.05, \**p*<.10. Two-tailed significance tests are used.

a First entry within each cell corresponds to estimated coefficients (robust standard errors in parentheses).

b Dependent variable is firm-idiosyncratic risk (%).

c Reported effects for the main variables are standardized to facilitate interpretation of interaction effects.

Notes: SFSFDSP = size of firm’s sales force downsizing from Selling Power (%); FPMF = firm’s product market fluidity; FAM = firm’s accruals management; EXT = CEO external focus; ADV = firm’s advertising intensity; SFSFUSP = size of firm’s sales force upsizing from Selling Power (%); SSFC = size of sales force change from Selling Power (%); QSSFC = quadratic of size of sales force change from Selling Power (%); R&D = firm’s research & development expenditures to firm’s sales; R&D\_i = firm’s research & development dummy; ADV\_i = firm’s advertising dummy; ROA = firm’s return on assets; LEV = firm’s financial leverage; LIQ = firm’s available liquidity; SIZE = firm size; IVOLAT = industry volatility; IGROW = industry growth; CF = residual term of control function model; IMR = Inverse Mills ratio estimated using Heckman’s selection model.