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Customer satisfaction underappreciation: The relation of customer satisfaction to CEO compensation☆

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ABSTRACT

Customer satisfaction contributes to firm financial performance, but does it contribute to top executives' pay? Our empirical evidence shows that it may not. Customer-satisfying executives tend to have lower pay than their productive peers, even if both satisfaction and productivity contribute to firm financial performance. Thus, customer satisfaction is underappreciated, which may result in both less societal welfare and worse company performance. We propose a board myopia mechanism to account for this phenomenon. In facing short-term financial performance pressure from investors, and the asymmetric information availability between accounting-based and market-based assets for compensation decisions, the board of directors may be myopic, underappreciating executives who invest in market-based assets such as customer satisfaction that drive long-term returns. We examine this satisfaction underappreciation phenomenon empirically using 23 years of panel data that detail firm productivity, customer satisfaction, firm financial performance, and executive compensation. The longitudinal data are analyzed using fixed-effect panel models and a simultaneous system of panel vector autoregression equations with interactions to assess the direct effect of firm financial performance and its carryover effect to executive compensation across executives who are productive, customer-satisfying, or both. The results confirm that customer-satisfying executives are underappreciated: being productive is financially rewarding for both firms and executives, while being customer-satisfying is financially rewarding for firms but not as much for executives. We further demonstrate that using total shareholder returns to benchmark firm financial performance and reward executives with a higher proportion of stock compensation can encourage a long-term focus that alleviates this customer underappreciation.

On April 9th, 2017, United Airlines violently dragged a customer off an overbooked flight, generating public outcries after the incident was videoed and shared worldwide. United's stock price flopped 1.3% that week and customers expressed their unhappiness when responding to United's customer surveys. To mitigate the negative impact, the board of United decided to link their CEO Oscar Munoz's pay more closely to customer satisfaction (BBC News, 2017).

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The United incident fully reveals the all-too-common disconnect between top executive pay and customer satisfaction. The troubling situation in which top executives make strategic decisions to benefit their own compensation, at the cost of their firms' long-term value, is well addressed in research into top executives' opportunistic behaviors to meet short-term performance goals (e.g., Balkin, Markman, & Gomez-Mejia, 2000; Henderson & Fredrickson, 1996; Lambert & Larcker, 1987). Research also notes the risk that financial markets might misprice the value of customer satisfaction (Ittner, Larcker, & Taylor, 2009; Jacobson & Mizik, 2009). Together, these studies, from finance, accounting, and marketing, recognize the missing link between firm financial performance and top executive compensation, and between market valuation and customer satisfaction; however, to the best of our knowledge, no studies consider that achieving customer satisfaction, a market-based asset, may be less financially rewarding for top executives than achieving accounting-based results, such as productivity or sales, as revealed by the United case in which frontline staff followed closely the company's policy of handling overbooking, maximizing operational efficiency, and ignored customer wellbeing and satisfaction. It reveals the possibility that the board might underappreciate top executives' efforts to satisfy customers rather than increase productivity or sales, even if doing so would drive long-term financial return.

With longitudinal data, we demonstrate that there is customer satisfaction underappreciation, such that customer-satisfying executives receive lower compensation than their more productive peers. We propose a board myopia mechanism to account for this phenomenon. Tangible accounting-based assets, such as productivity or sales, materialize their returns quicker than customer satisfaction, an intangible market-based asset.[1] Because customer satisfaction is largely intangible and its value to the firm is long-term (Bendle & Butt, 2018; Fornell, Mithas, Morgeson, & Krishnan, 2006; Fornell, Morgeson, & Hult, 2016; Srivastava, Shervani, & Fahey, 1998), its value to the firm may be more likely to be underrecognized or underappreciated by the board. Our empirical model substantiates that the slower pace at which customer satisfaction materializes its financial benefits causes the board, at least in the short run, to undervalue customer-satisfying executives, compared to their productive or sales-boosting peers.

This study makes three main contributions to marketing literature. First, we demonstrate the importance of addressing the distinct strategic consequences of market-based assets (i.e., customer satisfaction in this study), especially in terms of their implications for underappreciating top executives. Most management literature takes an agency theory perspective on addressing this misalignment, suggesting that top executives pursue self-interested strategies rather than ensuring the firm's interests (e.g., Bertrand & Mullainathan, 2001; Eisenhardt, 1989). We show that top executives are at risk of being underappreciated when they work hard to satisfy customers, which represents an important market-based asset to firms.

Second, considering that top marketing officers are most likely to suffer from this underappreciation, our direct evidence highlights the importance of factoring market-based assets, e.g., customer satisfaction, directly into compensation decisions, benchmarking firm performance using measures that align better with satisfaction, and rewarding top executives in a manner that encourages a long-term focus. The extant marketing literature recognizes the intangible and long-term nature of such assets (e.g., Bendle & Butt, 2018), but has limited information on the consequences of such omission. We show that the board may not fully realize customer-satisfying executives' contribution to the firm, and thus may underappreciate those executives.

Third, from a methodological perspective, we apply a unique panel vector autoregression (VAR) model with interactions (Towbin & Weber, 2011) to estimate the differential temporal impacts of short-term strategic outcomes (i.e., productivity or sales) and long-term strategic outcomes (i.e., customer satisfaction) on firm financial performance (total shareholder returns, TSR, abnormal TSR, and ROA), firm performance (Tobin's q), and executive compensation (total compensation and stock-based compensation) simultaneously. With our multiple-source 23-year panel data (gathered from Compustat North America, Compustat ExecuComp, and American Customer Satisfaction Index, ACSI), we estimate the direct effect of short-term and long-term strategic outcomes on firm performance and the carryover effects on executive compensation in a system of equations. The results of the VAR model with interactions are highly comparable with simple fixed-effect panel models that are robust across multiple alternative measures of exogenous and endogenous variables.

1. Customer satisfaction underappreciation

1.1. The phenomenon

Customer satisfaction underappreciation is a phenomenon in which customer-satisfying executives receive lower pay than productive (or sales-boosting) executives, even when customer satisfaction contributes to firm financial performance. We argue that this underappreciation stems from customer satisfaction being an intangible market-based asset that materializes its returns in the long-term. Consequently, even if customer satisfaction contributes to firm financial performance, and top executives who invest in it are not opportunistic, customer-satisfying executives are still likely to be underappreciated. We suggest two causally related potential sources of this satisfaction underappreciation.

1.1.1. Customer satisfaction is an intangible market-based asset

Market-based assets, such as customer satisfaction, customer relationship, or brand equity, are off-balance sheet assets (Srivastava et al., 1998) that provide a competitive edge, but information about them is not as readily available for compensation decisions as accounting-based assets, such as productivity, costs, and sales. Even if such information is available for the board, it is typically available at a longer interval, for example, the American Customer Satisfaction Index (ACSI) releases the information

[1] A common productivity measure assesses the ratio of output to a specific type of input, such as sales per employee (labor productivity) (Rust & Huang, 2012). Sales is another outcome candidate for such a short-term focus (Hauser, Simester, & Wernerfelt, 1994).

annually. It may require additional effort by the board to collect customer satisfaction information. One of the authors sits on several corporate boards where routinely the strategy discussions and performance reviews are about increasing sales, reducing costs, or increasing productivity, and seldom about satisfying customers. In one of the companies, the author had to urge the top management team to collect customer satisfaction data to evaluate the strategies and gauge executive performance.

1.1.2. Customer satisfaction is long-term focused

A top executive's typical strategic choice might involve whether to have a short-term focus, such as emphasizing achieving productivity or sales, that have a more immediate and visible impact on firm financial performance, or have a long-term focus, such as emphasizing achieving customer satisfaction, customer relationship, or brand equity, that has a long-term (but delayed) impact on firm financial performance. While satisfying customers productively is the most desirable outcome, it takes time for customer satisfaction to produce performance value (Fornell et al., 2006; Fornell et al., 2016; Jacobson & Mizik, 2009; Morgan & Rego, 2006). The long-term focus of customer satisfaction creates a tension in the top executive's strategic decision about whether to embrace a short-term, long-term, or dual strategy, with the tradeoff between customer satisfaction and productivity being a notable one (Anderson, Fornell, & Rust, 1997; Mittal, Anderson, Sayrak, & Tadikamalla, 2005; Rust & Huang, 2012; Rust, Moorman, & Dickson, 2002). In the 2018 regional EMAC conference keynote talk, Grant McKenzie, the marketing director of Asahi Breweries Europe Group, stated that marketing works in mid-term, but top management wants to see short-term results. Consequently, it is a constant tension for him to work to persuade the top management to consider and fully value the longer-term.

1.1.3. Summary

The facts that customer satisfaction is an intangible market-based asset and is long-term focused make it more difficult for the board to accurately reward those top executives who invest in such an asset. Thus, the conventional wisdom—that if executives achieve a higher level of customer satisfaction, all other things being equal, they should enjoy a higher level of pay—may not be straightforward.

1.2. One possible mechanism: board myopia

Many studies have examined whether the financial market prices customer satisfaction accurately and timely. These studies focus on the link between customer satisfaction and firm financial performance. They generally agree that customer satisfaction information is relevant to firm financial performance. For example, Fornell et al. (2006) find that investments in customer satisfaction lead to abnormal stock returns, indicating that satisfied customers are valuable economic assets to both firms and their investors in the long run. Jacobson and Mizik (2009) find that mispricing does occur among computer and Internet firms. Fornell et al.'s (2016) recent study confirms that even with risk-adjusted stock returns, customer satisfaction still offers robust abnormal returns. Whitler, Krause, and Lehmann's (2018) recent study concludes that the board is more likely to be short-sighted, putting the firm at a competitive disadvantage, if it does not include experienced marketers that can facilitate firm growth.

We go one step further to investigate whether customer-satisfying executives are underpaid, even if the financial market eventually prices customer satisfaction correctly. We examine one possible internal inefficiency: the board may be myopic in rewarding customer-satisfying executives.

Board myopia is characterized by the board of directors appreciating customer-satisfying executives less than productive or sales-boosting executives even when both assets contribute to firm financial performance, due to customer satisfaction being an intangible market-based asset that materializes its value in a longer-term.

Public firms are controlled by boards whose task is to hire and fire top executives, and determine top executive pay (Barkema & Gomez-Mejia, 1998). However, firm financial performance and executive compensation appear only weakly correlated (e.g., Boyd, 1994; Frydman & Jenter, 2010; Ozkan, 2011; Stahl, 2000).

Inconsistency about when the financial market will be efficient with regards to pricing customer satisfaction (e.g., Fornell et al., 2006; Jacobson & Mizik, 2009) introduces complexity to the board's compensation decisions. The board sits in the middle, between the external financial market and the internal management team. Faced with pressure and inconsistent information from both sides, its compensation decisions may favor short-term productivity or sales and deviate from the true value that customer-satisfying executives should earn. Together, the short-term financial performance pressure from investors and the intangible and long-term return nature of customer satisfaction, may result in the board underappreciating executives who aim to build customer satisfaction to support the firm's long-term value.

1.3. A possible remedy: stock-based compensation

The board's compensation decisions include determining pay level as well as pay composition. Pay level is directly linked to the firm financial performance that top executives achieve, and pay composition is linked to whether the board desires executives to have a short-term or long-term strategic focus.

Regarding pay level, even if the board understands the contribution of customer satisfaction to firm financial performance, if the linkage between satisfaction and financial performance is not as apparent as the linkage between productivity (or sales) and financial performance, the board either won't reward top executives accordingly based on customer satisfaction (i.e., to meet investors' expectation), or may myopically ignore satisfaction's contribution to firm financial performance (i.e., fail to see the linkage).

Regarding pay composition, if customer satisfaction is to be considered in the compensation package directly, because customer satisfaction takes time to achieve financial results, the compensation should be designed in a way to encourage a long-term strategic focus. Stock-based compensation is one long-term incentive plan that is used by the board to encourage a long-term focus by sharing firm ownership with the executive (Frydman & Jenter, 2010). In contrast, option-based compensation may not necessarily have the same effect because it only promises the executive the option to purchase the firm's stock at a predetermined price for a specific period.

Some compensation studies have demonstrated a positive relationship between market performance and long-term performance (versus accounting performance and short-term performance) and stock-based compensation. For example, Mehran (1995) finds that performance, as measured by market performance indices such as Tobin's *q* and return on assets, is positively related to equity-based compensation (including stocks and options), management ownership of stocks and options, and research and development expenses. Duru and Iyengar (2001) find that a firm's market performance is directly related to top executives' long-term compensation. Damodaran (2005) argues that many larger market cap firms use stock-based compensation to align managerial interests with stockholder interests.

Two key studies imply that satisfaction may be underappreciated, and that this underappreciation may be alleviated by designing the compensation package to incentivize achieving customer satisfaction. In their analytical model, Hauser et al. (1994) explain how and when incentivizing employees (managers, product designers, service providers, production workers) to increase customer satisfaction is profitable. They conclude that firms would be more profitable if they rewarded employees on the basis of sales quantity and customer satisfaction, as opposed to just sales quantity. Basuroy, Gleason, and Kannan (2014) examine the relationship among the design of CEO compensation, customer satisfaction, and firm value. Their results indicate that if the board is concerned about customer satisfaction and market value when designing compensation packages, it should attend to the strong sensitivity of pay to performance. Therefore, if the board incorporates a higher proportion of stock-based pay in top executives' compensation packages, it can reduce satisfaction underappreciation.

2. Method

2.1. Data

We test satisfaction underappreciation using a combination of three data sources that cover U.S. public firms from 1995 to 2017 (23 years). The firm performance data come from Compustat North America, while executive compensation data come from Compustat ExecuComp. The two databases cover about 3000 firms. ExecuComp includes annual data for the five highest paid executives. For customer satisfaction data, we turn to the ACSI panel (Fornell, Johnson, Anderson, Cha, & Everitt Bryant, 1996). The ACSI panel data are unbalanced, such that new firms are added to replace inactive ones over time, to maintain the representativeness of the database.

After merging the three data sources, we obtain an unbalanced panel of 2828 firm/executive-year observations from 150 unique firms during 1995–2017. All industries are represented, including agricultures/utilities (20.97%), manufacturing (22.56%), wholesale and retail trades (22.10%), transportation and warehousing (3.25%), information (10.64%), finance and insurance (10.71%), and other services (9.76%). Data availability is mainly constrained by the ACSI panel, which comprises approximately 200 firms. A firm must provide five consecutive years' observations to be included in the analysis. The size of our sample is comparable with Anderson and Mansi's (2009) investigation of 166 firms during 1994–2004, obtained after merging the ACSI database with the Compustat databases.

2.2. Measures

2.2.1. Strategic outcomes (assets)

We use two measures to capture the outcomes of an executive's strategic focus. The outcome of the short-term strategic focus (i.e., accounting-based assets) is captured by labor productivity. Following prior research (e.g., Bertschek & Kaiser, 2004; Datta, Guthrie, & Wright, 2005; Rust & Huang, 2012), we measure labor productivity as the logarithm of sales per 1000 employees, using dollar sales to capture total output and number of employees to measure labor input. As indicated in prior literature (e.g., Anderson et al., 1997; Rust & Huang, 2012), labor is the aspect of productivity most likely to generate tension with customer satisfaction. We note the large skew in productivity numbers and therefore take the natural logarithms of this variable. We check the robustness of our results using annual sales as the other outcome of the short-term strategic focus. An emphasis on pursuing sales indicates a firm's strategic focus on immediate returns. Sales quantity is examined as a factor for rewarding employees (Hauser et al., 1994), as opposed to customer satisfaction. Annual sales are log transformed.

The outcome of the long-term strategic focus (i.e., market-based assets) is captured by customer satisfaction scores (ACSI). Customer satisfaction refers to customers' overall evaluation of their experience of a firm's offering (Anderson et al., 1997), which provides an indicator of stable profit potential, because satisfied customers buy more, buy more often, buy at a higher price, and/or communicate their satisfaction to others (Hauser et al., 1994). The ACSI scores are indicators of customers' overall satisfaction level with a brand. The interval scale ranges from 0 to 100 (Luo & Bhattacharya, 2006), and most research uses the raw score (e.g., Grewal, Chandrashekaran, & Citrin, 2010; Mittal et al., 2005). The ACSI score refers to the brand level, which can result in multiple entries for a single firm. For the merger with the Compustat, firm-level data, we thus average the satisfaction scores

for all brands of the same firm (Ittner & Larcker, 1998). The firm-level ACSI scores represent average scores of customers using the firm's products.

2.2.2. Firm financial performance

We use total shareholder returns (TSR) to capture firm financial performance. TSR is commonly used to set top management goals and incentives (Feng, Morgan, & Rego, 2015). We calculate TSR as TSR = (share price$_t$ − share price$_{t-1}$ + dividends per share) / share price$_{t-1}$, where t = year. This equation shows that TSR ties closely to the financial market's expectation of firm performance, regardless of which strategies are used to achieve the performance. In the robustness checks, we include abnormal TSR as one additional firm financial performance variable. We estimate the Fama and French (1993) three-factor abnormal TSR by the equation: $ATSR_{it} = R_{it} - [\alpha_i + r_i(R_{mt} - R_{rf,t}) + s_iSMB_t + h_iHML_t]$, where $ATSR_{it}$ is the abnormal stock return for firm i in year t, the three factors of $R_{mt} - R_{rf,t}$, the risk-free market return rate, SMB_t, the return difference between small and big-firm stocks, and HML_t, the return difference between high and low book-to-market stocks. $R_{mt} - R_{rf,t}$, SMB_t, and HML_t are accessed from Fama and French's data library.[2]

In the robustness checks, in addition to TSR and abnormal TSR as firm financial performance, we include return on assets (ROA) as alternative short-term firm financial performance and Tobin's *q* as long-term firm value to gauge firm performance. ROA frequently serves to assess firm performance on the efficiency side in the marketing literature, particularly in the context of evaluating the relationship between customer satisfaction and financial returns (e.g., Anderson, Fornell, & Mazvancheryl, 2004; Fornell et al., 2006). We calculate ROA as net income divided by total assets.

Tobin's *q* is commonly used as a measure of long-term value to investigate the financial impact of customer satisfaction (Anderson et al., 2004; Mittal et al., 2005). Tobin's *q* is strongly associated with customer satisfaction (Morgan & Rego, 2006). Following prior literature, we define Tobin's *q* as the firm's market value relative to the replacement cost of its assets (Tobin, 1969): Tobin's *q* = [total assets − (deferred taxes + common equity) + (share price x number of common stock outstanding)] / total assets (Cremers & Ferrell, 2014). By taking the natural logarithm of *q*, we ensure that its distribution is approximately normal and reduce the impact of outliers (e.g., Shane & Klock, 1997).

2.2.3. Executive compensation

We use two metrics to capture compensation level and compensation composition. The annual total compensation that a top executive receives gauges the compensation level. Total compensation comprises salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), and long-term incentive payouts. It is the most commonly used total compensation metric (Chhaochharia & Grinstein, 2009; Faulkender & Yang, 2010). Executive compensation is log-transformed, which also is common practice in the compensation literature (Henderson & Fredrickson, 1996). Following Hillman, Shropshire, Certo, Dalton, and Dalton (2010) we add 1 to this variable so that we are able to transform zero values.

Stock-based compensation, calculated as the percentage of stock awarded to the executive out of the annual total compensation, gauges the extent to which compensation composition encourages long-term strategies (Gong, 2011). Valuation is based upon the grant-date fair value as detailed in FAS 123R. Stock awards give executives ownership in the firm and are typically used to incentivize top executives for longer-term firm performance by creating a sense of firm ownership.[3]

2.2.4. Control variables

We take into consideration the following industry, firm, and executive characteristics: whether the firm operates in the service sector (dummy coded, service = 1), whether the firm is in the information sector (dummy coded, information = 1),[4] the degree of market concentration (HHI), firm size (log-transformed number of employees), firm selling, general and administrative expenses (SG&A),[5] age of the CEO, gender of the CEO (dummy coded, male = 1), and whether there is a change of CEO in the data year (dummy coded, a CEO change in the year as 1, otherwise as 0). Due to the high proportion of missing data for R&D and advertising expenses, whether firms are comparable with and without R&D and advertising expense data is checked by including R&D expense coverage (dummy coded, non-missing = 1) and advertising expense coverage (dummy coded, non-missing = 1).

3. Panel vector autoregression model with interactions

We use a panel vector autoregression (VAR) model with interactions to test the proposed satisfaction underappreciation, because the data contain repeated time-series observations for firms (e.g., DeKinder & Kohli, 2008; Moriarty, 1975). Both cross-

[2] We also calculate abnormal TSR as the above industry (two-digit NAICS code) average TSR. The two calculations of abnormal TSR are highly correlated ($\gamma = 0.955$, $p < .000$).

[3] This is a narrower but more specific measure of equity-based compensation. We do not include options awards because 1) conceptually, options do not grant executives with firm ownership but the right to buy or sell the stock at a given condition, which thus operates more or less like other short-term financial incentives, and 2) our data also confirm this possibility such that it shows a negative correlation between stock pay and option pays, implying that the two types of equity-based compensation are used for different purposes.

[4] The literature shows that the tech industry behaves differently with respect to satisfaction and its higher growth rate (Jacobson & Mizik, 2009).

[5] A more direct control would be advertising expenses and R&D expenses; however, the two variables have high percentages of missing values, and thus instead we use the more general expense variable SG&A.

sectional regressions that assume away fixed firm/executive effects and standard techniques for estimating VAR that ignore firm heterogeneity are inappropriate for our panel data.

The model estimates how firm financial performance and executive compensation, as a system of equations, respond to firm financial performance improvement, and then evaluates the responses at varying productivity and satisfaction levels. The model is especially suitable for examining this satisfaction underappreciation for the following reasons. First, it allows us to estimate how productivity and satisfaction improve firm financial performance, and how the effects carry over to executive compensation. The model thus tests directly whether satisfaction is underappreciated. If productivity and satisfaction both improve firm financial performance, but customer-satisfying executives end up with lower pay than productive executives, it indicates that the board underappreciates customer satisfaction. Second, given that strategic outcomes for firm financial performance and executive compensation are not strongly exogenous and are time-varying, this model allows us to assess the effects of time-varying (weakly) exogenous variables such as productivity and customer satisfaction. Third, the model is dynamic in that it also takes into consideration the effects of firm financial performance and executive compensation in the previous period. For details of the panel vector autoregression model with interactions, see Towbin and Weber (2011).

We use the following model specification to estimate the time effect of all major variables, while controlling for unobserved heterogeneity across firms and dealing with the autocorrelation in the data. To the best of our knowledge, this research represents the first marketing study to employ this system panel VAR model with interactions. Formally,

$$\begin{pmatrix} 1 & 0 \\ \alpha_{0,it}^{21} & 1 \end{pmatrix} \begin{pmatrix} \Delta Financial\ performance_{it} \\ \Delta Compensation_{it} \end{pmatrix} = u_i + \sum_{l=1}^{L} \begin{pmatrix} \alpha_l^{11} & \alpha_{l,it}^{12} \\ \alpha_{l,it}^{21} & \alpha_{l,it}^{22} \end{pmatrix} \begin{pmatrix} \Delta Financial\ performance_{i,t-1} \\ \Delta Compensation_{i,t-1} \end{pmatrix} + U_{it}, \tag{1}$$

where $Financial\ performance_{i,t}$ is TSR (in the robustness checks abnormal TSR, ROA and Tobin's q), for firm i in period t; $Compensation_{i,t}$ is top executive compensation (total compensation or stock pay proportion); $U_{i,\ t}$ is a vector of uncorrelated iid shocks; μ_i is a vector of firm specific intercepts; L is the number of lags; and $\alpha_{l,\ it}^{jk}$ are deterministically varying coefficients. We transform the variables by first-differencing (i.e., the change in each variable in one time period) to remove the fixed firm-specific (or executive-specific) effect, because it does not vary with time.[6]

To estimate how the responses of firm financial performance and executive compensation vary with productivity and customer satisfaction levels, we incorporate interaction terms. The coefficients in Eq. (1) are given by Eq. (2):

$$\alpha_{l,it}^{jk} = \beta_{l,1}^{jk} + \beta_{l,2}^{jk} Prod_{it} + \beta_{l,3}^{jk} Sat_{it} + \beta_{l,4}^{jk} (Prod_{it} * Sat_{it}), \tag{2}$$

where $Prod_{it}$ is the firm's labor productivity level, Sat_{it} is the customer satisfaction level, and $Prod_{it} * Sat_{it}$ is the interaction of productivity and customer satisfaction for firm i in period t. In the robustness checks, sales are used to replace productivity.

In this system of panel VAR equations, both firm financial performance and executive compensation are modeled simultaneously as endogenous variables. For the firm financial performance equation, the predictors are productivity, customer satisfaction, their interaction, and previous period firm financial performance. For the executive compensation equation, the predictors include productivity, customer satisfaction, their interaction, firm financial performance, and previous period executive compensation.

Following the procedure proposed by Towbin and Weber (2011), we evaluate the effects of productivity and customer satisfaction $\alpha_{l,\ it}^{jk}$ at their higher (75th) percentile values, holding the values of the other variable at a lower (25th) percentile value, then compute the impulse responses.[7] We use bootstrapped standard errors to generate impulse responses and confidence intervals. We rely on the distribution of differences in the impulse responses to evaluate which fraction falls above 0, to compare the responses of executive compensation to a one standard deviation change in firm financial performance, across different levels of productivity and customer satisfaction. We also draw a 90% confidence interval from the simulated estimates.

4. Results

4.1. Model-free evidence

Table 1 details the industry, firm, and executive characteristics of our sample, including the means, standard deviations, minima, and maxima. Table 2 reports the correlation coefficients for variables in the analyses.

4.1.1. Correlational analysis

The correlation coefficients among the key variables (productivity, satisfaction, TSR, total compensation, and stock pay proportion) provide some model-free evidence about their relationships. Satisfaction correlates negatively with productivity ($\gamma = -0.12$), suggesting a tension between a short-term and long-term strategic focus.

[6] First-difference transformation is a common approach to handling omitted variables in panel data.

[7] We also evaluate the effects based on 20th and 80th percentile values of productivity and satisfaction, and the results are largely similar, indicating the robustness of the results to different cutoff values.

Table 1
Industry, firm, and executive characteristics.

	N	Mean	SD	Minimum	Maximum
Industry Characteristics					
Service (1 = service sector)	2,828	.564	.496	0	1
Information (1 = information sector)	2,828	.106	.308	0	1
HHI	2,828	.046	.058	.000	.399
Firm Characteristics					
R&D expense coverage (1 = not missing)	2,828	.446	.497	0	1
Ad expense coverage (1 = not missing)	2,828	.599	.490	0	1
SGA expense ($MM)	1,972	6,335.053	9,896.220	21.451	101,384
Employees (1,000)	2,802	92.118	175.970	1.138	2301
Sales ($MM)	2,827	25,598.180	41,649.360	48.352	483,522
Labor productivity	2,802	414.840	325.607	16.382	2,606.771
Customer satisfaction (ACSI)	2,338	76.181	6.023	49	91
ROA	2,827	.048	.088	-2.388	.375
Tobin's q	2,466	1.992	2.710	.475	105.090
TSR	2,638	.121	.578	-.972	12.638
Abnormal TSR	2,638	-.000	2.148	-5.058	12.079
Executive Characteristics					
Age	2,745	56.260	6.725	31	83
Gender (1 = male)	2,828	.961	.193	0	1
Change (1 = company change)	2,828	.082	.274	0	1
Total compensation ($MM)	2,828	10,443.940	16,522.140	0	600,347.400
Stock pay proportion	2,818	.230	.261	0	1

Satisfaction does not correlate with TSR, but correlates positively with abnormal TSR ($\gamma = 0.06$), which is consistent with the literature that satisfaction offers abnormal returns (Fornell et al., 2016). Together with its negative correlations with total compensation ($\gamma = -0.12$) and stock pay proportion ($\gamma = -0.05$), this provides some evidence regarding satisfaction underappreciation: even if satisfaction is associated positively with abnormal TSR, it does not bring customer-satisfying executives higher compensation.

On the short-term focus side, productivity correlates positively with TSR ($\gamma = 0.04$) and abnormal TSR ($\gamma = 0.17$), confirming that productivity, as a short-term focus outcome, interrelates closer with firm financial performance. Furthermore, productivity also correlates positively with total compensation ($\gamma = 0.04$) and stock pay proportion ($\gamma = 0.24$), indicating that being productive is more rewarding for executives.

4.1.2. Analysis of variance

To gather additional model-free evidence for satisfaction underappreciation, we conducted analyses of variance by categorizing firms/executives into four strategic outcome groups according to their levels of productivity (prod) and customer satisfaction (sat) based on a mean split: other (low-prod/low-sat), productivity (high-prod/low-sat), satisfaction (low-prod/high-sat), and dual (high-prod/high-sat). Table 3 presents the contrasts.[8]

Among the four groups of firms, we find that the productivity (9.573) and the dual (productivity and satisfaction) (9.720) groups generate more sales than the satisfaction group (9.321), $F = 34.50$, $p = .000$. In contrast, the satisfaction group is associated with more employees (4.312) than the productivity (3.187) and the dual (3.451) groups, $F = 177.97$, $p = .000$. The sharp contrasts between sales and number of employees among the three groups suggest that it requires more employees to satisfy customers, a finding that is consistent with the literature (Anderson et al., 1997).

For firm financial performance, all groups have a similar level of TSR. Nevertheless, there are significant differences in abnormal TSR. Both the satisfaction (0.332) and the dual (0.579) groups have higher abnormal returns than the productivity group (0.114), $F = 63.19$, $p = .000$. This reveals that satisfaction aligns better with abnormal TSR than with TSR.

For executive compensation, we find that in terms of total compensation (before log transformation), customer-satisfying executives have the lowest total compensation (8.200), compared with the productive executives (12.396) and the dual executives (10.707), $F = 8.62$, $p = .000$, confirming that satisfying customers is not financially rewarding to executives, unless they can achieve it productively.

For stock pay proportion, both the productive executives (0.286) and the dual executives (0.279) have a higher proportion of stock pay than the customer-satisfying executives (0.215), $F = 58.95$, $p = .000$, implying that, in our data, customer-satisfying executives have a lower proportion of stock pay, even if their total compensation is no different from productive executives.

[8] We also categorize firms/executives into the four groups based on the 75th percentile split, which is consistent with the VAR model with interactions. Results of the analysis of variance are almost identical with the mean split reported here.

Table 2
Correlations among variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.Service sector	**1.00**																	
2.Information sector	**0.30**	**1.00**																
3.HHI	**0.33**	**−0.16**	**1.00**															
4.Log firm size	**0.39**	**−0.10**	**0.39**	**1.00**														
5.RD expense coverage	**0.15**	**−0.04**	**0.29**	**0.27**	**1.00**													
6.AD expense coverage	**0.25**	**0.05**	**0.14**	**0.31**	**0.39**	**1.00**												
7.SG&A expense	**0.11**	**0.05**	**0.17**	**0.56**	0.03	**0.07**	**1.00**											
8.CEO age	**−0.08**	**−0.09**	**0.08**	**0.10**	**−0.18**	**−0.17**	0.04	**1.00**										
9.CEO gender	**0.05**	**−0.07**	**0.06**	0.01	**−0.08**	**−0.09**	−0.01	**0.06**	**1.00**									
10.CEO change	−0.02	−0.01	−0.01	−0.02	0.03	−0.02	−0.04	**−0.10**	0.03	**1.00**								
11.Log sales	**0.12**	−0.02	**0.18**	**0.75**	**0.07**	**0.10**	**0.70**	**0.10**	−0.03	**−0.09**	**1.00**							
12.Log productivity	**−0.41**	**0.12**	**−0.31**	**−0.42**	**−0.30**	**−0.31**	**0.26**	−0.01	**−0.05**	**−0.10**	**0.29**	**1.00**						
13.ACSI	**−0.28**	**−0.27**	**0.23**	−0.00	**0.33**	**0.21**	**−0.15**	0.01	**−0.06**	0.02	**−0.09**	**−0.12**	**1.00**					
14.ROA	−0.03	**−0.05**	−0.01	**0.14**	**0.15**	**0.16**	0.01	−0.00	−0.02	−0.01	**0.07**	**−0.10**	**0.24**	**1.00**				
15.Log Tobin's *q*	**0.14**	**0.13**	0.03	**0.09**	**0.40**	**0.36**	**−0.13**	**−0.14**	**−0.06**	**0.05**	**−0.11**	**−0.28**	**0.36**	**0.35**	**1.00**			
16.TSR	0.02	0.03	−0.02	**−0.08**	−0.01	−0.01	−0.03	−0.01	0.01	0.03	**−0.06**	**0.04**	0.00	**0.07**	**0.08**	**1.00**		
17.Abnormal TSR	**0.05**	**0.04**	**0.12**	0.04	0.03	**0.14**	**0.17**	−0.01	**−0.09**	**−0.06**	**0.16**	**0.17**	**0.06**	0.02	**−0.05**	**0.32**	**1.00**	
18.Log total pay	**0.04**	0.03	−0.00	**0.24**	−0.03	**0.08**	**0.17**	**0.09**	**−0.08**	**−0.07**	**0.29**	**0.04**	**−0.12**	0.02	**−0.06**	**−0.04**	**0.12**	**1.00**
19.Stock pay proportion	**−0.09**	−0.03	**0.05**	**0.06**	**−0.04**	−0.01	**0.28**	0.02	**−0.14**	**−0.10**	**0.24**	**0.24**	**−0.05**	−0.01	**−0.15**	−0.01	**0.40**	**0.34**

Notes: The unit of analysis is the firm/executive-year. Service sector is dummy coded with 1 indicating the service sector. Information sector is dummy coded with 1 indicating the information sector, Log firm size is the log transformation of per 1000 employees. RD expense coverage is dummy coded with I indicating R&D expense is not missing. AD expense coverage is dummy coded with 1 indicating advertising expense is not missing. The unit of SG&A expense is $MM. CEO gender is dummy coded with 1 indicating a CEO is a male. CEO change is dummy coded with 1 indicating a CEO changes his/her company during the data period. Entries in bold indicate significant correlation coefficients at 0.05. Abnormal total pay is omitted from the table due to its high correlation with total pay ($r = 0.907$).

Table 3
Contrasts of four productivity-ACSI groups: mean split.

	Other Low-Prod/Low-Sat (1)		Productivity High-Prod/Low-Sat (2)		Satisfaction Low-Prod/High-Sat (3)		Dual High-Prod/High-Sat (4)		F-value	p-prob.
Dependent variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Log no. of employment	4.261	$(1.246)_a$	3.187	$(1.182)_c$	4.312	$(1.004)_a$	3.451	$(1.090)_b$	177.97	.000
SG&A ($MMM)	5.212	$(11.786)_c$	10.247	$(10.986)_a$	3.755	$(4.457)_c$	7.311	$(8.836)_b$	37.97	.000
Log sales	9.141	$(1.329)_c$	9.573	$(1.149)_a$	9.321	$(.999)_b$	9.720	$(1.110)_a$	34.50	.000
ROA	.048	$(.074)_b$	.029	$(.114)_c$	.064	$(.073)_a$	.061	$(.065)_a$	25.20	.000
Log Tobin's *q*	.625	$(.564)_a$	.214	$(.380)_b$	.662	$(.539)_a$	.589	$(.567)_a$	119.61	.000
TSR	.077	(.545)	.152	(.733)	.109	(.394)	.138	(.483)	2.37	.068
Abnormal TSR	-.896	$(2.032)_c$	.114	$(2.156)_b$	.332	$(2.078)_{a,b}$	.579	$(2.006)_a$	63.19	.000
Total compensation ($MMM)	9.413	$(11.709)_{b,c}$	12.396	$(24.940)_a$	8.200	$(6.375)_c$	10.707	$10.838)_{a,b}$	8.62	.000
Log total compensation	8.602	(1.156)	8.762	(1.501)	8.657	(1.018)	8.733	(1.683)	2.14	.093
Stock pay proportion	.134	$(.219)_c$	.286	$(.278)_a$	.215	$(.243)_b$	.279	$(.264)_a$	58.95	.000

Notes: For each variable, the cell means without common subscripts are significantly different at the .000 level. These analyses do not take the dependence of firm-year observations into consideration.

4.1.3. Summary of model-free evidence

These results, based on simple statistics, provide model-free evidence of the misalignment between satisfaction, firm financial performance and executive compensation. Satisfaction results in higher abnormal TSR, but those executives receive lower total compensation and stock pay proportion. The effects we observe next, in our more sophisticated models, can also be observed in simpler analyses.

4.2. Simple model evidence: fixed-effect panel models

We first estimate single-equation fixed-effect panel models to provide simple model evidence. Fixed-effect models control for variables that don't vary within firms by removing firm-level heterogeneity, while taking into consideration the correlated nature of observations over time.

We estimate two models for total compensation and stock pay proportion, respectively, with one model using TSR and the other using abnormal TSR as firm financial performance. Both models include productivity, satisfaction, and their interaction (as captured by four combinations of productivity and satisfaction) as the strategic outcomes. We also include industry, firm, and executive characteristics as control variables. All models are estimated using standardized variable scores. We cluster the standard errors on firms to accommodate serial autocorrelation and cross-sectional heteroskedasticity.

Table 4 presents the results. Estimates for the constant in all models are omitted for simplicity and estimates for control variables are reported for the TSR model only. In the following discussion, we omit the results from the abnormal TSR model unless the significance pattern is different.

4.2.1. Total compensation results

We find that TSR significantly predicts total compensation in the negative direction ($\beta = -0.055, p = .048$), and abnormal TSR does not predict total compensation; both indicating a misalignment between firm financial performance and executive compensation.

For strategic outcome variables, only productivity matters. Productivity, but not customer satisfaction, significantly predicts total compensation ($\beta = 0.273$, $p = .021$). Specifically, productive executives have significantly higher compensation than the other three groups of executives ($\beta = 0.306$, $p = .045$).

For industry, firm, and executive characteristics, executives who are in the service sector ($\beta = 0.533$, $p = .001$), in a more concentrated market ($\beta = 0.196$, $p = .036$), and hire more employees ($\beta = 0.247$, $p = .051$) tend to have higher total compensation. No executive characteristics significantly predict total compensation.

Together, the total compensation results suggest that the board is more likely to grant top executives higher total compensation based on productivity than on customer satisfaction. The results provide stronger support for satisfaction underappreciation than the model-free evidence (which do not control for autocorrelation and heteroskedasticity and do not control for the other variables that are included in the model). After accounting for the impact of firm financial performance, only productivity matters for total compensation. Achieving higher customer satisfaction does not appear to contribute to higher pay for top executives.

4.2.2. Stock pay proportion results

TSR is not a significant predictor, but abnormal TSR is, for stock pay proportion. This opposite pattern of relationship between TSR and total compensation, and between abnormal TSR and stock pay proportion shows that abnormal TSR aligns better with firm financial performance than TSR. It aligns less with total compensation and aligns better with stock pay proportion.

For the strategic outcome variables, both productivity and satisfaction matter. The impact of customer satisfaction changes from insignificant in the total compensation model to significant in the stock pay proportion model ($\beta = 0.163, p = .051$). Among the four groups of firms/executives, both the productive executives ($\beta = 0.519, p = .006$) and the dual executives ($\beta = 0.506, p = .007$) have

Table 4
Fixed-effect panel models: log productivity and ACSI as the short- and long-term strategic outcomes.

Firm financial performance	TSR B (SE)	Abnormal TSR B (SE)
DV: Log total compensation		
Firm performance		
TSR	-.055(.027)*	
Abnormal TSR		.030(.027)
Strategic outcomes		
Log(productivity)	.273(.116)*	.256(.120)*
Customer satisfaction	-.000(.050)	-.014(.053)
High-prod/low-sat	.306(.151)*	.297(.146)*
Low-prod/high-sat	-.012(.087)	-.029(.090)
High-prod/high-sat	.113(.128)	.085(.135)
Control variables		
Service sector	.533(.156)***	
Information sector	-.506(.197)**	
HHI	.196(.093)*	
Log(emp)	.247(.126)*	
RD coverage (1 = not missing)	-.010(.163)	(omitted)
AD coverage (1 = not missing)	-.127(.149)	
SGA expense	-.084(.088)	
CEO age	.027(.061)	
CEO gender	-.113(. 134)	
CEO change	.076(.150)	
Model statistics		
R^2	.008	.009
F	(16,111) 17.27	(16,111) 13.68
DV: Stock pay proportion		
Firm performance		
TSR	-.030(.020)	
Abnormal TSR		.162(.037)***
Strategic outcomes		
Log(productivity)	.471(.201)*	.336(.188)†
Customer satisfaction	.163(.083)*	.115(.081)
High-prod/low-sat	.519(.186)**	.518(180)**
Low-prod/high-sat	.127(116)	.103(115)
High-prod/high-sat	.506(.185)**	.460(.175)**
Control variables		
Service sector	.888(.296)**	
Information sector	-.935(.317)**	
HHI	.292(.115)**	
Log(emp)	.172(.169)	
RD coverage (1 = not missing)	.154(155)	(omitted)
AD coverage (1 = not missing)	.415(139)**	
SGA expense	.171(.076)*	
CEO age	-.048(.039)	
CEO gender	-.283(.313)	
CEO change	-.001(.125)	
Model statistics		
R^2	.061	.089
F	(16,111) 9.37	(16,111) 15.72

Notes. Estimates for the constant for all models are omitted for simplicity and estimates for control variable are reported for the TSR model only and are omitted for the abnormal TSR model. All model *F* values are significant at .000. *** $p < .000$ ** $p < .01$ * $p < .05$ † $p < .1$

a higher proportion of stock pay than the customer-satisfying executives. The results suggest that either 1) stock pay can only rectify satisfaction underappreciation when executives achieve satisfaction productively, or 2) the board doesn't pay the customer-satisfying executives with a higher proportion of stock, resulting in customer underappreciation as found in the total compensation model.

For industry, firm, and executive characteristics, executives who are in the service sector ($\beta = 0.888$, $p = .03$) or in a more concentrated market ($\beta = 0.292$, $p = .013$) have a higher proportion of stock pay, whereas those in the information sector have a lower proportion of stock pay ($\beta = -0.935$, $p = .004$). Additionally, those firms with advertising expense data available tend to pay their

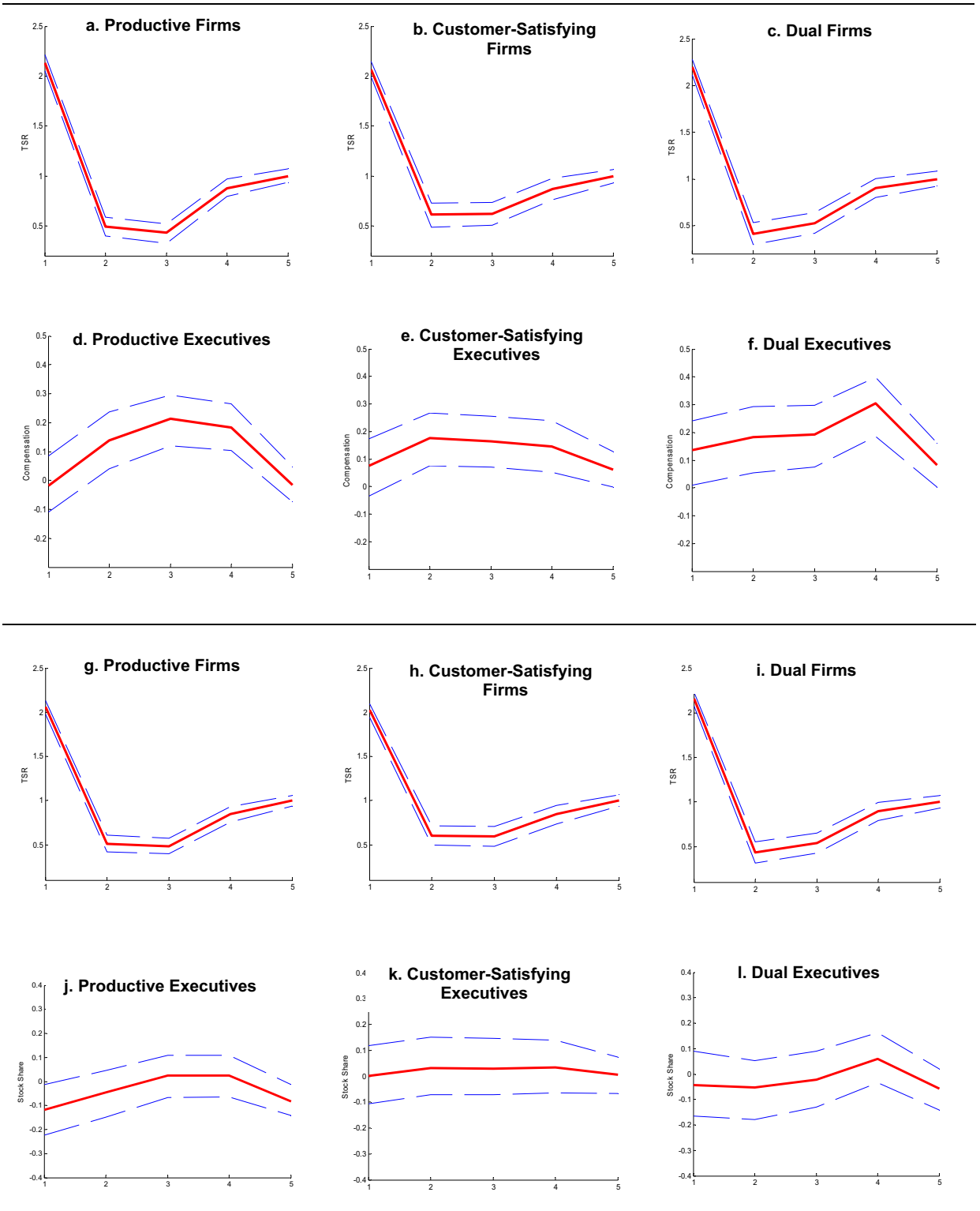

Fig. 1. Impulse responses of TSR and total compensation (top panel) and TSR and stock pay proportion (bottom panel) to TSR shock across three productivity-satisfaction conditions.

executives with a higher proportion of stock ($\beta = 0.415$, $p = .004$). Firms with higher SG&A expenses also pay their executives a higher proportion of stock ($\beta = 0.171$, $p = .027$). Results of the control variables are similar between the two models.

The stock pay proportion results suggest that stock pay appears to be able to encourage achieving customer satisfaction, but not necessarily alleviate satisfaction underappreciation, because satisfaction needs to be achieved productively.

4.3. Results of the VAR model with interactions

We estimate two models: Model 1 is a system of equations with TSR and total compensation as the endogenous (dependent) variables. Model 2 replaces total compensation with stock pay proportion to see whether stock-based compensation alleviates the board myopia against customer satisfaction. Three-year lags provide the most interpretable results, which may imply that the board is characterized by myopic compensation decisions. If the model fits nicely without any time lags, the board instead would have appeared to align firm financial performance effectively with executive compensation.

The top panel of Fig. 1 (Fig. 1a–f) shows the impulse responses of TSR and total compensation to a TSR shock (i.e., demand for better TSR), evaluated for 5 periods.[9] The bottom panel of Fig. 1 (Fig. 1g–l) shows the impulse responses of TSR and stock pay proportion to the demand for TSR improvement. Table 5 reports the coefficient estimates and significance tests.

4.3.1. Total compensation results

Fig. 1a–c (the top panel of Table 5) reveals that all three strategic outcomes achieve significantly higher TSR, indicating that both productivity and satisfaction increase firm financial performance. Among the three strategic outcomes, both the productive firms (2.13) and the dual firms (2.20) generate significantly higher initial TSR than the customer-satisfying firms (2.07), with all pairwise contrasts significant at $p < .01$.

However, the higher initial TSR generated by the productive firms does not sustain itself. From period 2, the customer-satisfying firms begin to catch up and generate significantly higher TSR (0.62) than the productive firms (0.50) and the dual firms (0.41), with all pairwise contrasts significantly at least at $p < .1$. The higher TSR generated by the customer-satisfying firms sustains to period 3, with the customer-satisfying firms (0.62) and the dual firms (0.53) generating significantly higher TSR than the productive firms (0.43), $p < .05$. The levels and patterns of TSR that the three strategic outcomes generate show that improving productivity (either productivity-only or dual) is a quick fix, whereas improving satisfaction is a more sustainable solution.

For the carryover effect from TSR to total compensation (Fig. 1d–f), except for the dual executives (0.14, $p < .1$), it appears that it takes one period for the board to incorporate the information about TSR improvement into the compensation decision for the productive and the customer-satisfying executives, as shown by the lack of total compensation responses for executives in the two conditions.

In contrast to the comparable TSR that the customer-satisfying firms achieved with the dual firms, the board tends to reward the dual executives more than the customer-satisfying executives (0.30 vs 0.14 for period 4, $p < .01$), indicating that being able to achieve satisfaction productively conveys a stronger message to the board for their compensation decisions. The dual executives are rewarded sooner and greater. These results confirm that satisfaction is likely to be underappreciated, if it is not achieved productively.

4.3.2. Stock pay proportion results

Can stock pay alleviate satisfaction underappreciation? When the pay is shifted from total compensation to stock pay proportion, Fig. 1g–i shows that, similarly, all three strategic outcomes have significantly higher TSR. Among the three, the dual firms have the highest TSR (2.16), followed by the productive firms (2.06) and the customer-satisfying firms (2.02), all contrasts significant at $p < .01$, suggesting that productivity has stronger initial impact. Nevertheless, the customer-satisfying firms catch up from period 2, generating significantly higher TSR than the productive firms (0.60 vs 0.51, $p < .05$) and the dual firms (0.60 vs 0.43, $p < .05$). This higher TSR sustains to period 3, which is still higher than the productive firms (0.59 vs 0.48, $p < .1$) and is comparable with the dual firms. This pattern of results indicates that although satisfaction has a delayed effect, it is as effective in increasing TSR as the dual focus.

For the carryover effect from TSR to stock pay proportion (Fig. 1j–l), the board awards the customer-satisfying executives (0.00) and the dual executives (−0.04) equally but awards the productive executives (−0.12) less, with pairwise contrasts significant at least at $p < .1$. There are delayed rewards for executives in all three conditions in period 5, with the customer-satisfying executives receiving a significantly higher proportion of stock pay (0.01) than the productive executives (−0.08) and the dual executives (−0.06), with pairwise contrasts significant at least at $p < .1$. This reward pattern indicates that stock-based pay buffers better against satisfaction underappreciation. When the board uses it to reward executives' contribution to the firm, customer-satisfying executives are not underappreciated, compared to the dual executives.

4.4. Robustness checks

We run three sets of additional models to check the robustness of our results by 1) using sales as an alternative short-term outcome variable, 2) using ROA and Tobin's q as alternative firm performance variables, and 3) using fixed-effect panel models as alternative models. All of the Tables and Figures for the robustness checks are included in the Appendix A.

[9] We follow the traditions of the VAR literature to determine how many periods to report (e.g., Nijs, Dekimpe, Steenkamp, & Hanssens, 2001). For most of our models the IRF values do not significantly differ from zero by the fifth period.

Table 5
Impulse responses of TSR and total compensation (top panel) and of TSR and stock pay proportion (bottom panel) to TSR shock across three productivity-satisfaction conditions.

	High-Prod/Low-Sat (Productivity)	Low-Prod/High-Sat (Satisfaction)	High-Prod/High-Sat (Dual)
TSR			
1st period	2.13***$_b$	2.07***$_c$	2.20***$_a$
2nd period	.50***$_b$	.62***$_a$	.41***$_c$
3rd period	.43***$_b$	.62***$_a$	.53***$_a$
4th period	.88***	.87***	.90***
5th period	1.00***	1.00***	1.00***
Average	.96	1.04	1.01
Total Compensation			
1st period	-.02 $_b$	.07 $_a$	.14* $_a$
2nd period	.14*	.18**	.18**
3rd period	.21 ***	.16**	.19***
4th period	.18***$_b$	.14** $_b$	.30***$_a$
5th period	-.02 $_b$	.06 $_a$	.08 $_a$
Average	.10	.12	.18
TSR			
1st period	2.06***$_b$	2.02***$_c$	2.16***$_a$
2nd period	.51***$_b$	.60***$_a$	.43***$_c$
3rd period	.48***$_b$	.59***$_a$	.54***$_{a,b}$
4th period	.85***	.85***	.90***
5th period	1.00***	1.00***	1.00***
Average	.98	1.01	1.01
Stock Pay Proportion			
1st period	-.12 $_b$	.00 $_a$	-.04 $_a$
2nd period	-.05	.03	-.05
3rd period	.02	.03	-.02
4th period	.02	.03	.06
5th period	-.08* $_b$	.01 $_a$	-.06 $_b$
Average	-.04	.03	-.02

Note. Entries with different subscripts are significantly different between conditions.
Responses are significant at * $p < .10$ ** $p < .05$ *** $p < .01$

4.4.1. Sales as an alternative short-term outcome variable

In this set of VAR models with interactions, we replace productivity with sales as the short-term outcome variable. The results are similar to those of the productivity models. Table A1 reports the results.

For TSR, we similarly observe that all three strategic outcomes are effective for increasing TSR, but satisfaction achieves so in a delayed manner. Compared with productivity as the short-term outcome, sales appear to be associated more closely with TSR, generating a more comparable TSR with the dual focus.

The carryover effect from TSR to total compensation shows that the board favors the sales-boosting executives and the dual executives. This again confirms that boosting sales is more short-term than increasing productivity, which undermines customer-satisfying executives even further.

Can stock pay fix satisfaction underappreciation? We find that the three strategic outcomes achieve similar TSR, and that there are no significant carryover effects from TSR to stock pay proportion across executives in the three outcomes, indicating that stock pay incentivizes all three strategic outcomes and executives more equally than total compensation.

Together, results using sales as the short-term strategic outcome corroborate the results using productivity as the short-term strategic outcome. The findings further reveal that boosting sales is even more short-term than increasing productivity.

4.4.2. ROA and Tobin's q as alternative firm performance variables

We run additional panel VAR model with interactions using ROA and Tobin's *q* as two alternative firm performance variables to test whether the board would compensate top executives differently when different firm performance variables are involved in compensation decisions. We use ROA to capture the short-term firm performance and Tobin's *q* to gauge the long-term firm performance.

Table A2 reports the coefficient estimates and significance tests of total compensation. Fig. A1 shows the responses of total compensation to ROA improvement (2a–2c) and Tobin's *q* improvement (2d–2f) respectively. The responses of ROA and Tobin's *q* are all significant across conditions and across periods but are omitted here for the sake of simplicity.

When ROA is used as the short-term firm performance, we find an apparent satisfaction underappreciation. Among the three strategic outcomes, when ROA is improved, the board rewards the dual executives with consistently higher total compensation, followed closely by the productive executives. The customer-satisfying executives receive substantially lower total pay.

When Tobin's q is used as the long-term firm performance measure, we find that when Tobin's q is improved, the board still rewards the dual executives the most, followed by the productive executives, with the customer-satisfying executives being rewarded the least. It is interesting to note that the board did not increase the pay to the productive executives immediately; instead, the pay increased only in period 3, implying that a long-term firm performance improvement (such as Tobin's q) directs the board to pay attention to the longer-term. The board did not reward the customer-satisfying executives more (or less) for the improvement on Tobin's q.

Together, the results of using ROA and Tobin's q to gauge firm performance and their carryover impact on total compensation similarly indicate satisfaction underappreciation, with short-term firm performance (ROA) favoring productive executives, and long-term firm performance (Tobin's q) encouraging a delayed compensation increase.[10]

4.4.3. Additional fixed-effect panel models

We run additional fixed-effect panel models to check whether the simple model results are robust to different firm performance variables (i.e., ROA and Tobin's q) and to a different short-term outcome variable (i.e., sales).

Table A3 presents the results for productivity as the short-term outcome. For total compensation, the results are highly similar to firm performance gauged by TSR and abnormal TSR. Like abnormal TSR, neither ROA nor Tobin's q predicts total compensation, confirming a misalignment between firm performance and executive compensation.

For stock pay proportion, we obtain almost identical results with using TSR to gauge firm financial performance. The only additional finding is that executive gender becomes significant when Tobin's q is used to gauge firm performance, with male executives having lower proportion of stock pay ($\beta = -0.623$, $p = .020$).

Table A4 presents the results using sales as the short-term strategic outcome. For total compensation, the results are highly similar to those using productivity as the short-term outcome (see Tables 4 and A2). One notable finding is that when Tobin's q is used to gauge firm performance, all three strategic outcomes have a similar level of total compensation, but the level is lower than the other group (the low-prod/low-sat group, meaning that the strategy focuses on achieving outcomes other than sales and customer satisfaction).

For stock pay proportion, the results are similar to those using productivity as the short-term outcome, in that both sales and satisfaction predict marginally significantly for stock pay proportion when firm (financial) performance is gauged by TSR ($\beta = 0.172$, $p = .060$), ROA ($\beta = 0.159$, $p = .077$), and Tobin's q ($\beta = 0.156$, $p = .074$), respectively. However, there is no significant difference in stock pay proportion across groups of executives. The results show that stock pay is effective in alleviating satisfaction underappreciation, in that both sales and satisfaction matter for total compensation and that there is no pay difference across the three strategic outcomes.

4.4.4. Summary

Overall, combining results from all different models, we confirm consistently that the board is likely to underappreciate customer-satisfying executives. Satisfying customers is not financially rewarding to executives, if the strategies are not achieved productively.

5. Discussion

The empirical results from the two sets of analyses (fixed-effect panel and panel VAR model with interactions) consistently confirm the existence of customer satisfaction underappreciation. Due to short-term, visible firm financial performance pressure, tension between short-term and long-term strategic focuses, as exemplified by productivity and satisfaction in this study, and the asymmetric information availability between the two strategic outcomes for compensation decisions (as manifested by their distinct cross-period patterns of responses to firm financial performance), the board tends to be myopic in compensating executives who achieve customer satisfaction, with the result that customer-satisfying executives are undervalued. Because firms, their top executives, or both, thus may suffer from achieving customer satisfaction, a deeper understanding of this satisfaction underappreciation phenomenon is critical, to help firms balance their productivity and customer satisfaction and attain win-win outcomes. We thus detail some of the implications of our findings for researchers and managers.

5.1. Are top executives underappreciated for satisfying customers?

The United case suggests that there is a short-term performance bias in the business world, even if marketers have long recognized the value of customer satisfaction to firms. Our empirical results confirm that this short-term bias exists, such that the board rewards short-term focus, such as those that produce productivity and sales, more than those that increase customer satisfaction. Productive or sales-generating executives are consistently rewarded more than customer-satisfying executives.

When executives do not achieve customer satisfaction productively, their financial returns suffer. Given the tension between achieving productivity and satisfaction, or more generally the tension between achieving short- and long-term strategic outcomes, this finding highlights the pressure of short-term firm performance that investors impose on the board, which results in the board's myopic decisions to underpay customer-satisfying executives.

[10] We refer to the Bendle and Butt (2018) paper in discussing that although there is likely a positive bias for Tobin's q, it appears that it is more in line with our results for the dual executives. We have no further data to determine why this is the case, but intuitively, we consider that it might be likely that in our context, the accounting measure of Tobin's q (as used here) captures both productivity and satisfaction; thus, those executives who are satisfying customers productively respond strongly.

While board myopia is likely to force top executives to focus on short-term, that choice may be detrimental to long-term firm performance. This highlights the need for firms to recognize and manage satisfaction underappreciation; otherwise both firms and executives might suffer from poorer financial returns.

5.2. Can board myopia be overcome?

5.2.1. Use TSR as the performance basis for compensation decisions

Our findings suggest that board myopia may be alleviated in two ways. First, a firm may use total shareholder returns (TSR) to benchmark performance so that executives are rewarded when customer satisfaction improves TSR. The robustness checks, using ROA and Tobin's *q* as the alternative firm performance variables in the VAR models, reveal that using TSR to benchmark firm performance appears to grant customer-satisfying executives more appropriate compensation. Using ROA and Tobin's *q* to benchmark firm performance tends to result in apparent satisfaction underappreciation. While both productivity and satisfaction achieve better ROA or Tobin's *q*, this achievement only benefits the compensation of productive executives, but not the compensation of less productive executives who satisfy customers. In general, ROA improvement benefits the productive and the dual-focused executives more, whereas Tobin's *q* improvement mainly benefits the dual executives. These findings suggest that short-term firm performance (ROA) biases the board's pay decisions toward productive executives, while long-term firm performance (Tobin's *q*) orients the board toward those executives who can satisfy customers productively. This conclusion supports the increasing trend of the board using TSR to set top management goals and incentives. In the marketing literature, many researchers use ROA and Tobin's *q* as performance measures. Boards that use ROA and Tobin's *q* for setting compensation may end up with unintended consequences, given that those metrics tend to under-reward customer satisfaction.

5.2.2. Use stock pay to incentivize achieving customer satisfaction

The board may pay executives a higher proportion of stock-based compensation to encourage a long-term strategic focus. The findings from the stock pay proportion VAR models (the bottom panel of Fig. 1 and Table 5) reveal that when executives are paid with stock, both the customer-satisfying and the dual executives achieve better TSR than the productive executives, suggesting that stock pay incentivizes achieving customer satisfaction. The fixed-effect models (the bottom panel of Table 4) show a positive relationship between satisfaction and stock pay, which does not exist for total compensation (the top panel of Table 4). As a result, based on our findings, boards should use a higher proportion of stock compensation if they want to encourage achieving customer satisfaction.

5.2.3. Factor customer satisfaction information into compensation decisions

In addition to relying on using stock-based compensation to alleviate customer underappreciation, a more direct and marketing-related approach is to factor customer satisfaction directly into the compensation decisions. Feasible methods include having customer satisfaction information available on a more frequent basis, making it more directly comparable with accounting data such as sales, revenue, or productivity, and making it publicly available to both investors and the board. As marketing educators, if we continue to ignore customer underappreciation, we should not expect our students (i.e., future marketers) to emphasize customer satisfaction, if in the business world it is less relevant to their pay.

5.3. Further research and limitations

In addition to its limitations, this study offers several opportunities for further research. First, the satisfaction underappreciation observed in the business world and substantiated by our empirical results can be considered as a special case (but one that is highly relevant to marketing) of a market-based asset that takes time to materialize its value and thus results in underappreciation. The findings may well generalize to any market-based assets, such as market orientation, customer relationship management, or brand equity, that similarly take time to materialize. Future research can extend our findings and explore its generalization.

Second, since some firm performance metrics such as ROA and Tobin's *q* might favor productivity or a dual strategic focus, firms should choose their performance benchmarks carefully to balance short-term and long-term focuses. We find that TSR may be one candidate. Additional mechanisms for preventing satisfaction underappreciation should be explored.

Third, we focus on CEO compensation. It also would be insightful to investigate the compensation of various members of the top management team, to determine whether their compensation responds differently. A particularly interesting approach might be to compare chief marketing officers (CMO) with other chief officers, such as chief information or chief operations officers. The CMO typically is responsible for customer satisfaction. Are CMOs underappreciated more for their efforts to satisfy customers? Huang and Rust (2011) address the differential impacts of productivity and satisfaction on CMO and CIO (chief information officers) compensation level and compensation composition. Their preliminary findings suggest that CMOs might suffer more from satisfaction underappreciation and that a higher proportion of equity-based pay can alleviate this. On the contrary, a recent study on CMO and CEO compensation in inducing marketing myopia finds that CMOs take advantage of equity-based pay to benefit themselves (Artz & Mizik, 2017). These seemingly inconsistent findings indicate more research on this topic is needed.

Fourth, the persistence of pay increases for productivity gains may suggest a ratchet effect, i.e. the reluctance to lower compensation. Regarding the consistent preference of productivity over customer satisfaction, especially when productivity gains do not

have a sound basis (e.g. improved customer satisfaction and retention), it may not sustainable. In this case, it is worthwhile for future research to examine the productivity bias combined with the ratchet effect to see their joint effect on satisfaction underappreciation.

6. Conclusions

To maximize firm financial performance, an intuitive strategic option would be to seek achieving customer satisfaction and productivity together. However, this intuitively appealing strategy is complicated by the presence of short-term financial performance pressure from investors, the productivity-satisfaction tension, and their asymmetric information availability for compensation decision, creating customer satisfaction underappreciation for top executives. Achieving customer satisfaction with lower productivity, even if it ultimately benefits firm financial performance, may cause top executives to suffer lower pay. We develop a board myopic mechanism to account for this satisfaction underappreciation and empirically test it with 23 years of panel data. The results confirm the existence of satisfaction underappreciation. To avoid this underappreciation, the board can use TSR or abnormal TSR to benchmark firm financial performance, and reward executives with stock pay to encourage a long-term focus. Customer satisfaction information should appear more frequently, to help guide the board's decisions, and ideally satisfaction results should appear within firm financial statements. Furthermore, the board should be alerted to this potential underappreciation and instead reward top executives more for their efforts to improve customer satisfaction and/or productivity, in accordance with the firms' objectives.

Appendix A

Table A1
Impulse responses of TSR and total compensation (top panel) and of TSR and stock pay proportion (bottom panel) to TSR shock across three sales-satisfaction conditions.

	High-Sale/Low-Sat (Sales)	Low-Sale/High-Sat (Satisfaction)	High-Sale/High-Sat (Dual)
TSR			
1st period	2.15***	2.13***	2.18***
2nd period	.63***	.50***	.52***
3rd period	.52***	.55***	.58***
4th period	.88***	.90***	.91***
5th period	1.00***	1.00***	1.00***
Total Compensation			
1st period	.05	.08	.19**
2nd period	.21***	.15*	.25***
3rd period	.27***	.14*	.25***
4th period	.21***	.20***	.30***
5th period	.06	.05	.16***
TSR			
1st period	2.04***	2.11***	2.10***
2nd period	.63***	.50***	.54***
3rd period	.55***	.57***	.60***
4th period	.88***	.89***	.89***
5th period	1.00***	1.00***	1.00***
Stock Pay Proportion			
1st period	-.05	-.05	.02
2nd period	.04	.00	.00
3rd period	.10	-.02	.02
4th period	.06	.05	.06
5th period	-.02	-.04	.00

* $p < .10$
** $p < .05$
*** $p < .01$

Table A2
Impulse responses of total compensation to ROA or Tobin's *q* shock across three productivity-satisfaction conditions.

	High-Prod/Low-Sat (Productivity)	Low-Prod/High-Sat (Satisfaction)	High-Prod/High-Sat (Dual)
ROA on Total Compensation			
1st period	.15*	.16	.15*
2nd period	.26***	.18*	.25***
3rd period	.35***	.04	.36***
4th period	.27***	.04	.31***
5th period	.18***	.10	.24***
Average	.24	.10	.26
Tobin's *q* on Total Compensation			
1st period	.11	.14	.40***
2nd period	.17	.17	.42***
3rd period	.36***	.12	.37***
4th period	.35***	-.01	.47***
5th period	.24***	.07	.43***
Average	.25	.10	.42

Note. Entries are the carryover effects of ROA (or Tobin's *q*) on total compensation. The direct effects of the three strategic outcomes on ROA and Tobin's *q* are omitted for simplicity.
* $p < .10$
** $p < .05$
*** $p < .01$

Table A3
Fixed-effect panel models: log productivity and ACSI as the short- and long-term strategic outcomes.

Firm financial performance	ROA B (SE)	Log Tobin's q B (SE)
DV: Log total compensation		
Firm performance		
ROA	-.003(.053)	
Log Tobin's *q*		.004(.133)
Strategic outcomes		
Log(productivity)	.321(.115)**	.382(.136)**
Customer satisfaction	-.033(.049)	-.013(.053)
High-prod/low-sat	.287(.160)†	.333(.186)†
Low-prod/high-sat	-.036(.086)	-.100(.106)
High-prod/high-sat	.057(.129)	-.055(.172)
Control variables		
Service sector		
Information sector		n.s.
HHI		
Log(emp)		
RD coverage (1 = not missing)	(omitted)	(omitted)
AD coverage (1 = not missing)		
SGA expense		
CEO age		
CEO gender		
CEO change		
Model statistics		
R^2	.009	007
F	(16,112) 226.69	(16,106) 60.92
DV: Stock pay proportion		
Firm performance		
ROA	-.037(.053)	
Log Tobin's *q*		-.084(.052)
Strategic outcomes		
Log(productivity)	.476(.191)**	.470(.150)**
Customer satisfaction	.156(.082)†	.165(.081)*
High-prod/low-sat	.492(.179)**	.482(.185)**
Low-prod/high-sat	.133(.110)	.152(.124)
High-prod/high-sat	.472(.178)**	.307(.187)†
Control variables		
Service sector		
Information sector		
HHI		
Log(emp)		
RD coverage (1 = not missing)	(omitted)	(omitted)
AD coverage (1 = not missing)		
SGA expense		
CEO age		
CEO gender		-.623(.263)*
CEO change		
Model statistics		
R^2	.068	.080
F	(16,112) 10.27	(16,106) 11.43

Notes. Estimates for the constant for all models are omitted for simplicity and estimates for control variables are reported for the TSR model only (see Table 4) and are omitted here unless there is a different significance level. All model *F* values are significant at .000.

** $p < .01$
* $p < .05$
† $p < .1$

Table A4
Fixed-effect panel models: log sales and ACSI as the short- and long-term strategic outcomes.

Firm (financial) performance	TSR B (SE)	Abnormal TSR B (SE)	ROA B (SE)	Log Tobin's q B (SE)
DV: Log total compensation				
Firm performance				
TSR	-.050(.025)*			
Abnormal TSR		.032(.027)		
ROA			.000(.055)	
Log Tobin's *q*				.018(.128)
Strategic outcomes				
Log(sales)	.528(.167)**	.503(.175)**	.578(.171)***	.706(.224)**
Customer satisfaction	.006(.054)	-.008(.057)	-.031(.052)	-.018(.056)
High-sale/low-sat	-.396(.254)	-.420(.264)	-.344(.237)	-.554(.278)*
Low-sale/high-sat	-.284(.203)	-.304(.210)	-.287(.199)	-.405(.247)†
High-sale/high-sat	-.342(.300)	-.380(.315)	-.336(.296)	-.614(.356)†
Control variables				
Service sector	.569(.169)***			
Information sector	-.259(.251)			
HHI	.183(.093)*			
Log(emp)	-.231(.105)*			
RD coverage (1 = not missing)	-.029(.171)	(omitted)	(omitted)	(omitted)
AD coverage (1 = not missing)	-.087(.135)			
SGA expense	-.088(.081)			
CEO age	.024(.062)			
CEO gender	-.105(.146)			
CEO change	.085(.149)			
Model statistics				
R^2	.003	.004	005	.002
F	(16,111) 26.73	(16,111) 40.33	(16,112) 10.00	(16,106) 11.34
DV: Stock pay proportion				
Firm performance				
TSR	-.025(.019)			
Abnormal TSR		.162(.036)***		
ROA			-.029(.051)	
Log Tobin's *q*				-.084(.054)
Strategic outcomes				
Log(sales)	.849(.265)**	.676(.254)**	.837(.247)***	.735(.206)***
Customer satisfaction	.172(.090)†	.123(.089)	.159(.089)†	.156(.086)†
High-sale/low-sat	-.235(.187)	-.281(.181)	-.207(.170)	-.105(.193)
Low-sale/high-sat	-.152(.141)	-.178(.137)	-.131(.132)	-.103(.148)
High-sale/high-sat	-.005(.210)	-.085(.199)	.012(.193)	.022(.230)
Control variables				
Service sector	1.060(.368)**			
Information sector	-.715(.449)	-.679(.341)*		-1.240(.456)**
HHI	.265(.113)*			
Log(emp)	-.729(.206)***			
RD coverage (1 = not missing)	.190(.162)	(omitted)	(omitted)	(omitted)
AD coverage (1 = not missing)	.499(.153)***			
SGA expense	.192(.091)*			
CEO age	-.054(.042)			
CEO gender	-.276(.327)			-.602(.287)*
CEO change	.001(.125)			
Model statistics				
R^2	.054	.080	.062	.066
F	(16,111) 6.51	(16,111) 8.75	(16,112) 6.93	(16,106) 7.76

Note. Constant and control variables are estimated but estimates are omitted for simplicity, except for the TSR model. All model *F* values are significant at .000.
*** $p < .000$
** $p < .01$
* $p < .05$
† $p < .1$

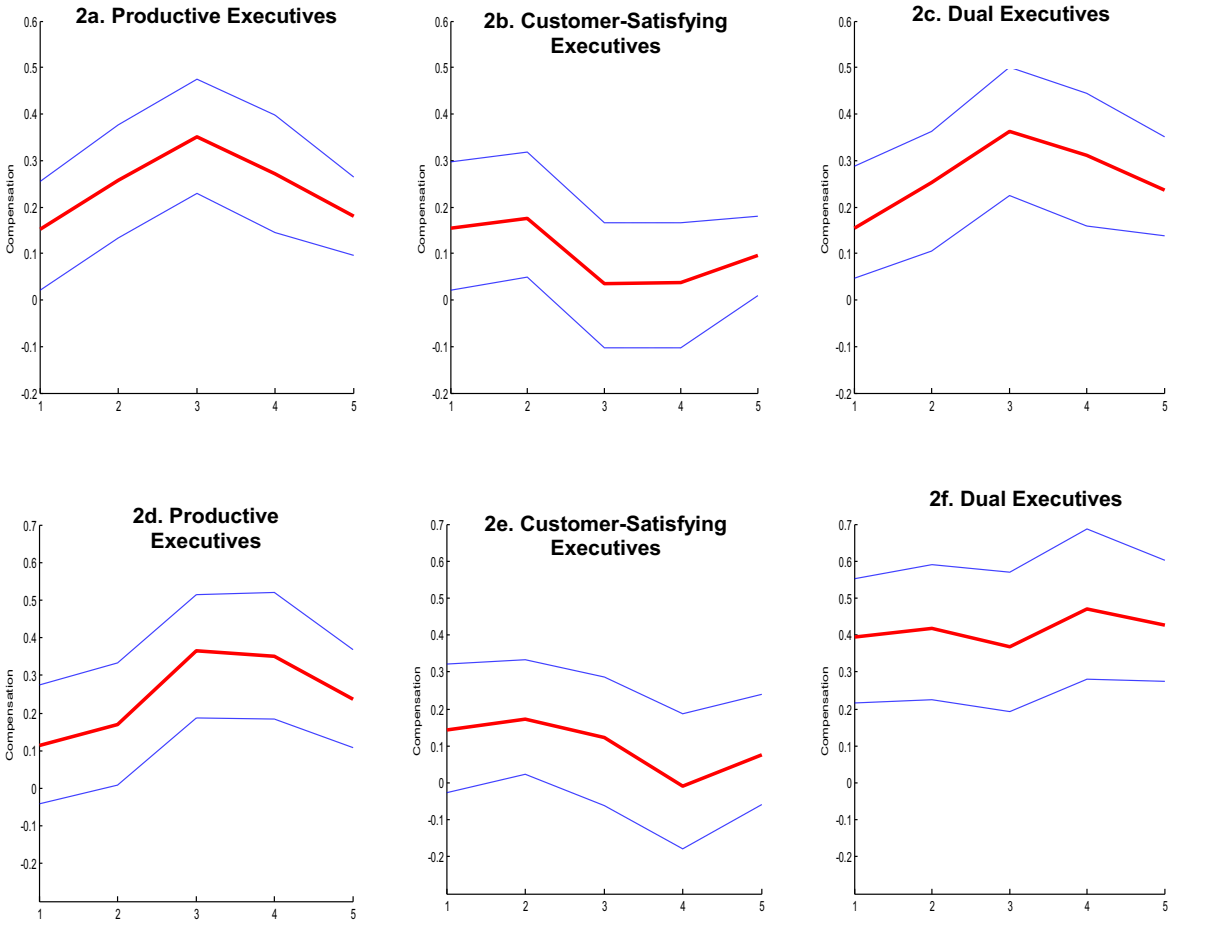

Fig. A1. Impulse responses of total compensation to shock in ROA (top panel) and Tobin's *q* (bottom panel) across three productivity-satisfaction conditions

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