

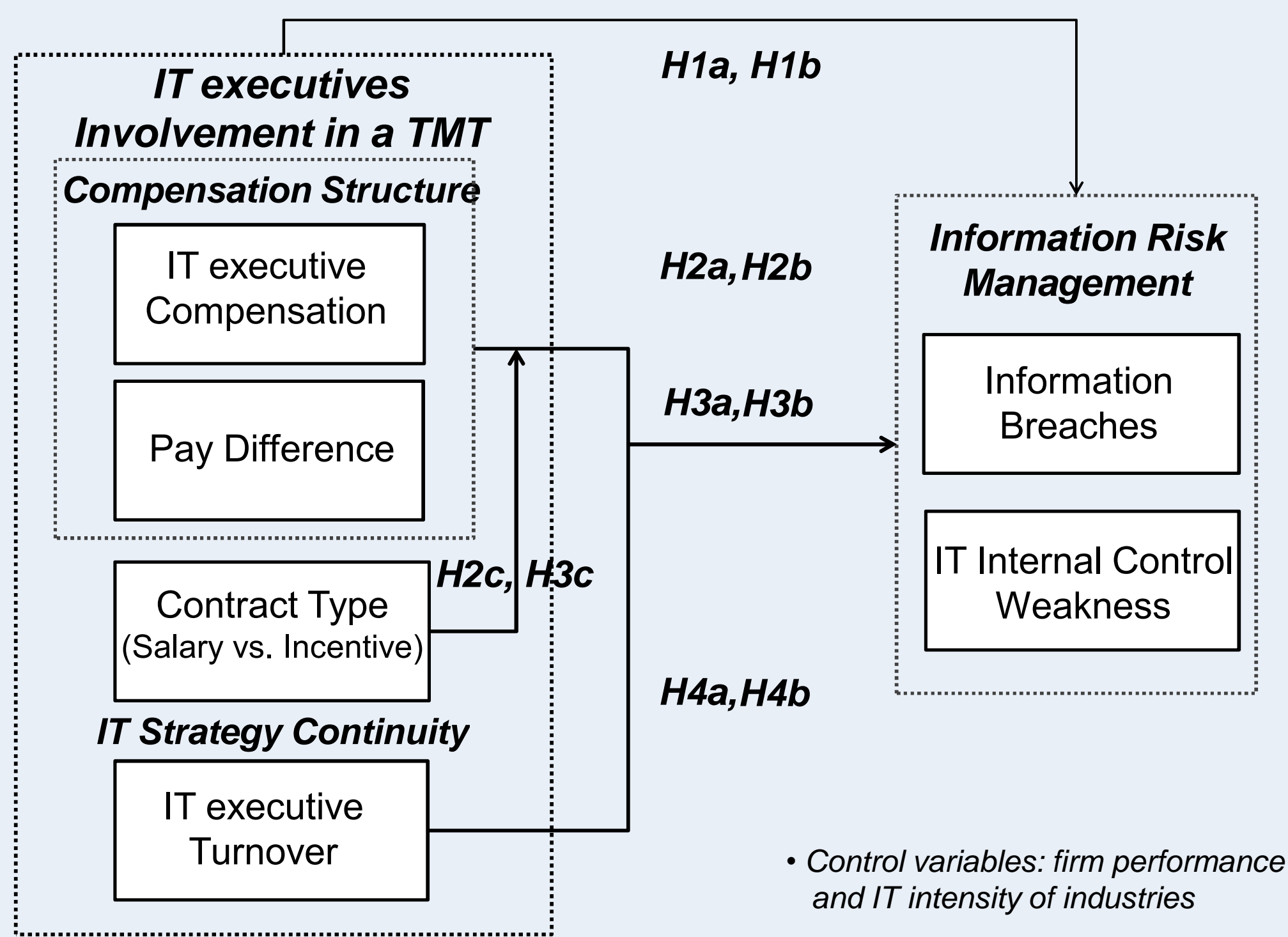
Information Risk Management and IT Executives' Structural Status in a Top Management Team

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Research Background & Motivation

- Information as a critical asset in a firm
- Legislative Compliance Requirements
 - Section 404 of SOX, GLBA and HIPAA
- The Final Responsibility for Information Risk Management rests with Top Executives
 - IT executives on enterprise-wide collaboration for deploying controls across all functions
 - Fair authority, compensation and membership in a TMT as a key ingredient for information risk management

Research Model



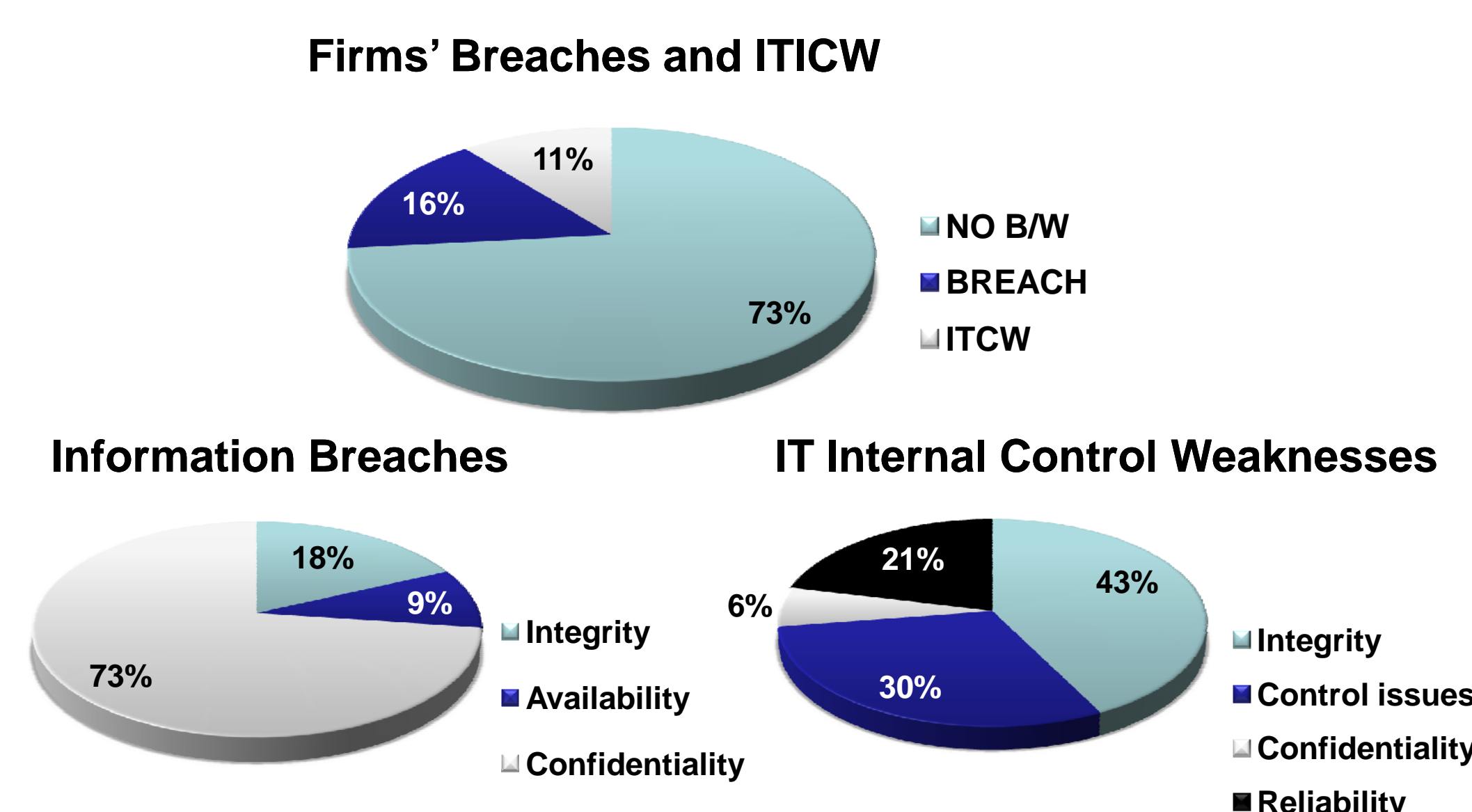
Hypotheses

- IT executive involvement in a Top Management Team (TMT)**
 - H1a and H1b**: IT executives' direct membership in a TMT decreases information breaches & IT Internal Control Weaknesses
- Compensation Levels**
 - H2a and H2b**: The higher compensation, The higher performance in information risk management.
 - H2c**: A salary-based contract with task uncertainty of information risk has a larger positive effect on information risk management.
- Pay Difference as Strong motivation**
 - H3a and H3b**: When IT executives' compensation levels are larger than those of non-IT executives within a firm, a firm's performance in information risk management increases.
 - H3c**: Pay difference in an Incentive-based contract has a larger positive effect on information risk management.
- Turnover**
 - H4a and H4b**: High IT executive turnover may disrupt organizational continuity of IS strategy and hurt firm performance in information risk management.

Data Collection

- Measuring Firms' Performance in Information Risk Management
 - Information breach incidents (2003 ~ 2008)
 - Public firms' 232 breaches among 577 incidents
 - Newswires - Lexis/Nexis, Cnet, Zdnet
 - IT internal control weaknesses (2004 ~ 2008)
 - Audit Analytics in WRDS (Section404)
 - 153 IT Internal control weaknesses in public firms
- Executive compensation and other information
 - ExecuComp in WRDS for the S&P 1500

Descriptive Statistics



Research Method: Logistic Regressions

Variables	Description	Value	Source
BREACH	Information Breaches	1 or 0	Leixs/Nexis, CNet,&ZDNet
ITCW	IT internal controls weakness	1 or 0	Audit Analytics
ITEXT	IT Executive Involvement	1 or 0	ExecuComp
COMP	Compensation	Continuous	ExecuComp
TYPE	salary or incentive contracts	1 or 0	ExecuComp
DISP	Pay Difference between IT and non IT executives	Continuous	ExecuComp
TURNOVER	IT executive turnover	Continuous	ExecuComp
ITINT	IT Intensity: Industry	Continuous	BEA
FVALUE	ROA	Continuous	ExecuComp

IT executive involvement : Model (1)

$$\text{logit}(P_j(y_{i,t} = 1)) = f_j(\alpha_0 + \alpha_1 \text{ITEXE}_{i,t-1} + \gamma_1 \text{FVALUE}_{i,t-1} + \gamma_2 \text{ITINT}_{i,t-1})$$

$$i = 1, \dots, n \text{ firms at year } t$$

Compensation Structure and Turnover

Conditional Logit : Model(2)

$$\text{logit}(P_j(y_{i,t} = 1) / \sum_k P_j(y_{i,t} = 1)) = f_j(\beta_1 \text{COMP}_{i,t-1} + \beta_2 \text{BDISP}_{i,t-1} + \beta_3 \text{ODISP}_{i,t-1} + \beta_5 \text{TURNOVER}_{i,t-1})$$

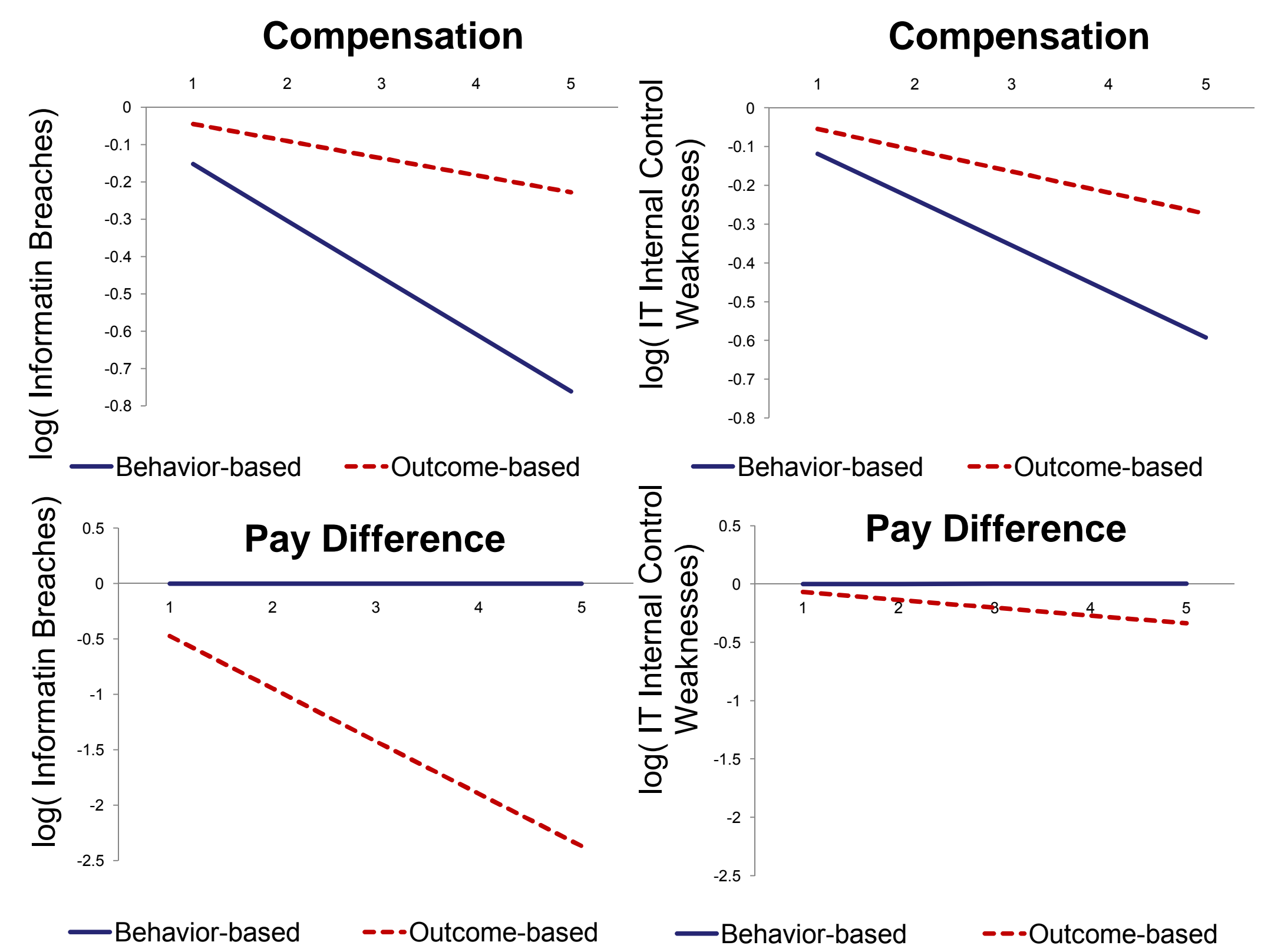
Unconditional Logit : Model(3)

$$\text{logit}(P_j(y_{i,t} = 1)) = f_j(\beta_0 + \beta_1 \text{COMP}_{i,t-1} + \beta_4 \text{DISP}_{i,t-1} + \beta_5 \text{TURNOVER}_{i,t-1} + \delta_1 \text{COMP}_{i,t-1} * \text{TYPE}_{i,t-1} + \delta_2 \text{DISP}_{i,t-1} * \text{TYPE}_{i,t-1} + \gamma_3 \text{FVALUE}_{i,t-1} + \gamma_4 \text{ITINT}_{i,t-1})$$

Results

IT executive involvement in TMTs		Model(1)	
H1a	Information breaches	— Supported	-0.366... (0.215)
H1b	IT internal control weakness	— Supported	-0.725... (0.317)
IT executive Compensation		Model (2) and (3)	
H2a	Information breaches	— Supported	-10.67... (5.10)
H2b	IT internal control weakness	— Supported	-6.37... (1.737)
H2c	Salary-based contracts	> Supported	-10.67... (5.10) -6.37... (1.737)
Pay Difference between IT and non-IT executives		Model (2) and (3)	
H3a	Information breaches	— Supported	-47.41... (15.29)
H3b	IT internal control weakness	— Supported	-6.76... (3.648)
H3c	Salary-based contracts	< Supported	47.36... (15.29) 6.81... (3.663)
IT executive Turnover		Model (2) and (3)	
H4a	Information breaches	+ Supported	1.04... (0.29)
H4b	IT internal control weakness	+ Supported	1.47... (0.505)

The Interaction Effects of Contract Types



Conclusion

- The positive effect of IT executives' direct relationship with top executives
- The larger effect of IT executive compensation in a salary-based contract with task uncertainty of information risk.
- The larger effect of pay difference between IT and non-IT executives in an Incentive-based contract with task uncertainty of information risk
- The importance of organizational continuity of IS strategy in information risk management