

PROACTIVE VERSUS REACTIVE SECURITY INVESTMENTS IN THE HEALTHCARE SECTOR

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Appendix A

The Distribution of Security Controls

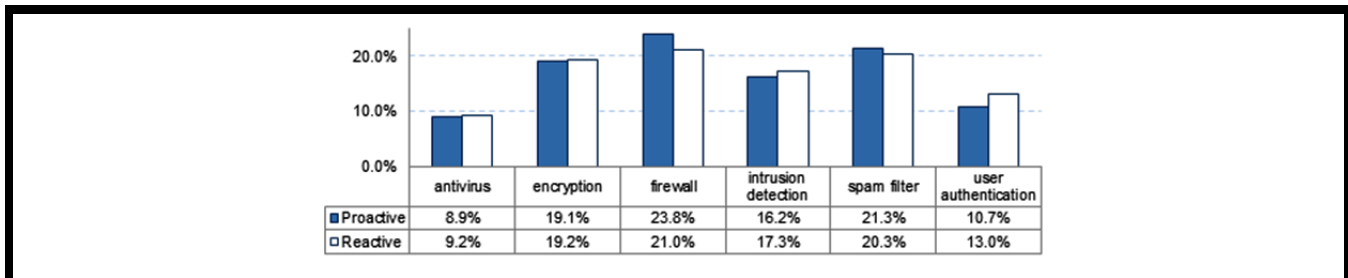


Figure A1. Security Controls in Proactive Versus Reactive Investments

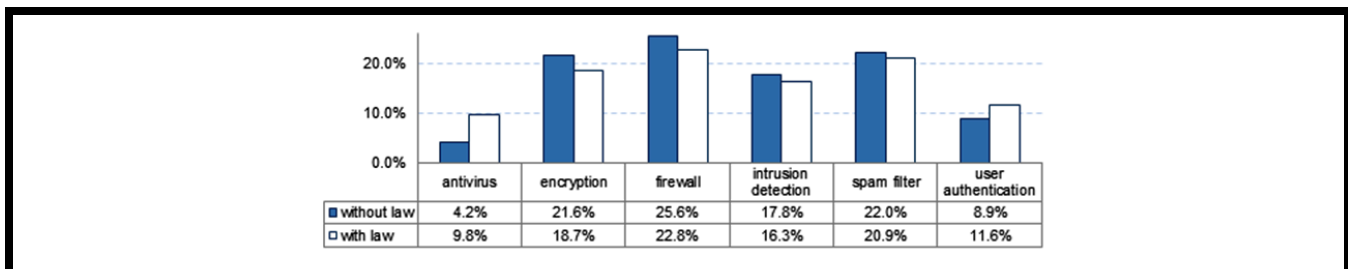


Figure A2. Security Controls With Law Versus Without Law

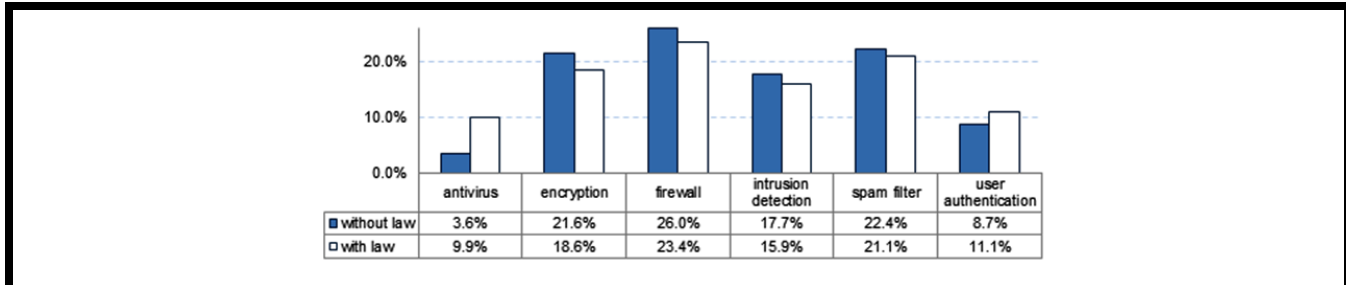


Figure A3. Security Controls With/Without Law in Proactive Investments

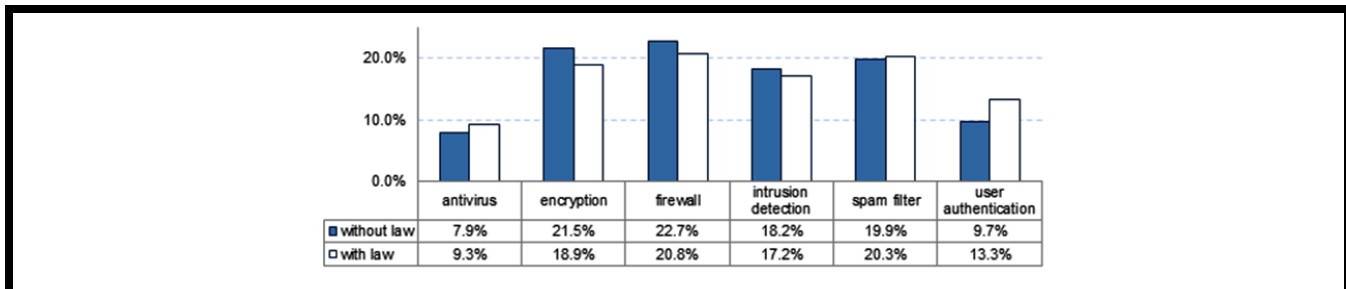


Figure A4. Security Controls With/Without Law in Reactive Investments

Appendix B

The Results with the Monetary Values of Security Controls

We estimated the investment costs of security controls based on industry and analyst reports of the major security vendors. Next, the total costs of security controls (including software licensing, implementation, and annual maintenance) were estimated considering the organization size. Interestingly, we found that the results from this monetary analysis were consistent with those based on the number of security controls. This new analysis provides strong evidence for the robustness of our results.

Table B1. The Average Prices of Security Controls

One user / 3 year	Antivirus	Encryption	Firewall	Intrusion Detection	Spam	User Authentication
License	\$80.6	\$15.9	\$67	\$230.0	\$60	\$22.4
Maintenance	\$9.4	\$8.1	\$51	\$124.5	\$13.5	\$86.0
Total	\$90.0	\$24.0	\$118.0	\$354.5	\$73.5	\$108.4

Note: Dollar values = security control × price × organization size

Table B2. The Results from the Hazard Model With the Monetary Values of Security Controls				
	Model (1)		Model (2)	
	β_j	$h(t)$	β_j	$h(t)$
Total Inv.	-0.042** (0.016)	0.958		
<i>Proactive Inv.</i> (H1a)			-0.041** (0.017)	0.960
<i>Reactive Inv.</i> (H1b)			0.002 (0.018)	0.998
<i>Proactive</i> (H2)	-2.876*** (0.873)	0.056		
<i>Law</i> (H3)	-1.762*** (0.636)	0.172	-1.550*** (0.660)	0.212
<i>Proactive</i> × <i>Law</i>	1.383 (0.839)	3.985		
<i>Total Inv.</i> × <i>Law</i>	0.036** (0.016)	1.037		
<i>Proactive Inv.</i> × <i>Law</i> (H4a)			0.032** (0.017)	1.032
<i>Reactive Inv.</i> × <i>Law</i> (H4b)			0.016 (0.019)	1.016
Controls				
Correction for self-Selection (λ)	-2.837** (1.473)	0.059	-0.959 (1.202)	0.383
<i>IT equipment</i>	0.050 (0.124)	1.051	-0.002 (0.121)	0.999
<i>Bed size</i>	1.681*** (0.239)	5.371	1.573*** (0.202)	4.821
<i>Academic</i>	0.954** (0.400)	2.598	0.798** (0.416)	2.222
<i>Hospital</i>	-0.261 (0.244)	0.770	-0.118 (0.226)	0.889
Years				
<i>LL</i> *		-2787.94		-2779.19

Notes: Number of observations = 3,982. Standard errors are in parentheses. P-values are represented by *Significant at $p < 0.1$, **Significant at $p < 0.05$, ***Significant at $p < 0.01$.