



Identity Fraud – Valuing Compromised Data

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The Economics of Security

- (Most) Security problems are actually economic problems
- (Most) Effective security measures are rooted in economics
- *“Never spend more money solving a problem than tolerating it will cost you”* (Courtney’s Second Law)



Two Very Different Actors

- Rational criminal behavior
 - Strictly financial motivations
 - Deterred when economic costs exceed their benefit
 - Notion of “Acceptable Losses”
- Irrational actors
 - Non-financial motivation
 - Terrorists, pedophiles, political activists, etc
 - “Acceptable Losses” may be effectively zero
 - Only deterred when economic costs exceed their means, not their benefit
 - Tradeoffs between enemy’s (anticipated) capabilities and deployment of our own



What is the Value?

Breach	Number of CC Account Numbers	Value @ \$3 per ⁽¹⁾	Value @ \$100 per ⁽²⁾	Cost @ \$182 per ⁽³⁾
CardSystems (mid 2005) 2006 Rev (est): \$20M Assets acquired for \$47M	40 Million	\$120 Million	\$4 Billion	\$7.28 Billion
TJX (July 2005) ⁽⁴⁾ Cap: \$12.35B 2006 Rev: \$17.4B	95 Million (and growing)	\$285 Million 23% 1.6%	\$9.5 Billion 77% 55%	\$17.2 Billion 139% 99%

(1) Symantec, March 2007

(2) World Bank / APWG, January 2005

(3) Ponemon, October 2006

(4) 450,00 "Full Identities" also compromised

March 2007: The Market Rates

Item	Advertised Price (In US Dollars)
United States-based credit card with card verification value	\$1–\$6
United Kingdom-based credit card with card verification value	\$2–\$12
An identity (including US bank account, credit card, date of birth, and government issued identification number)	\$14–\$18
List of 29,000 emails	\$5
Online banking account with a \$9,900 balance	\$300
Yahoo Mail cookie exploit—advertised to facilitate full access when successful	\$3
Valid Yahoo and Hotmail email cookies	\$3
Compromised computer	\$6–\$20
Phishing Web site hosting—per site	\$3–5
Verified PayPal account with balance (balance varies)	\$50–\$500
Unverified PayPal account with balance (balance varies)	\$10–\$50
Skype account	\$12
World of Warcraft account—one month duration	\$10

Table 3. Advertised prices of items traded on underground economy servers

Source: Symantec Corporation

- 33x Risk Premium on cash bank accounts
- High Risk Premiums in general (especially ‘complete identity’)
- C V V secret is “part of the deal”
- Seems to indicate commodization, maturing market



Impact to TJX

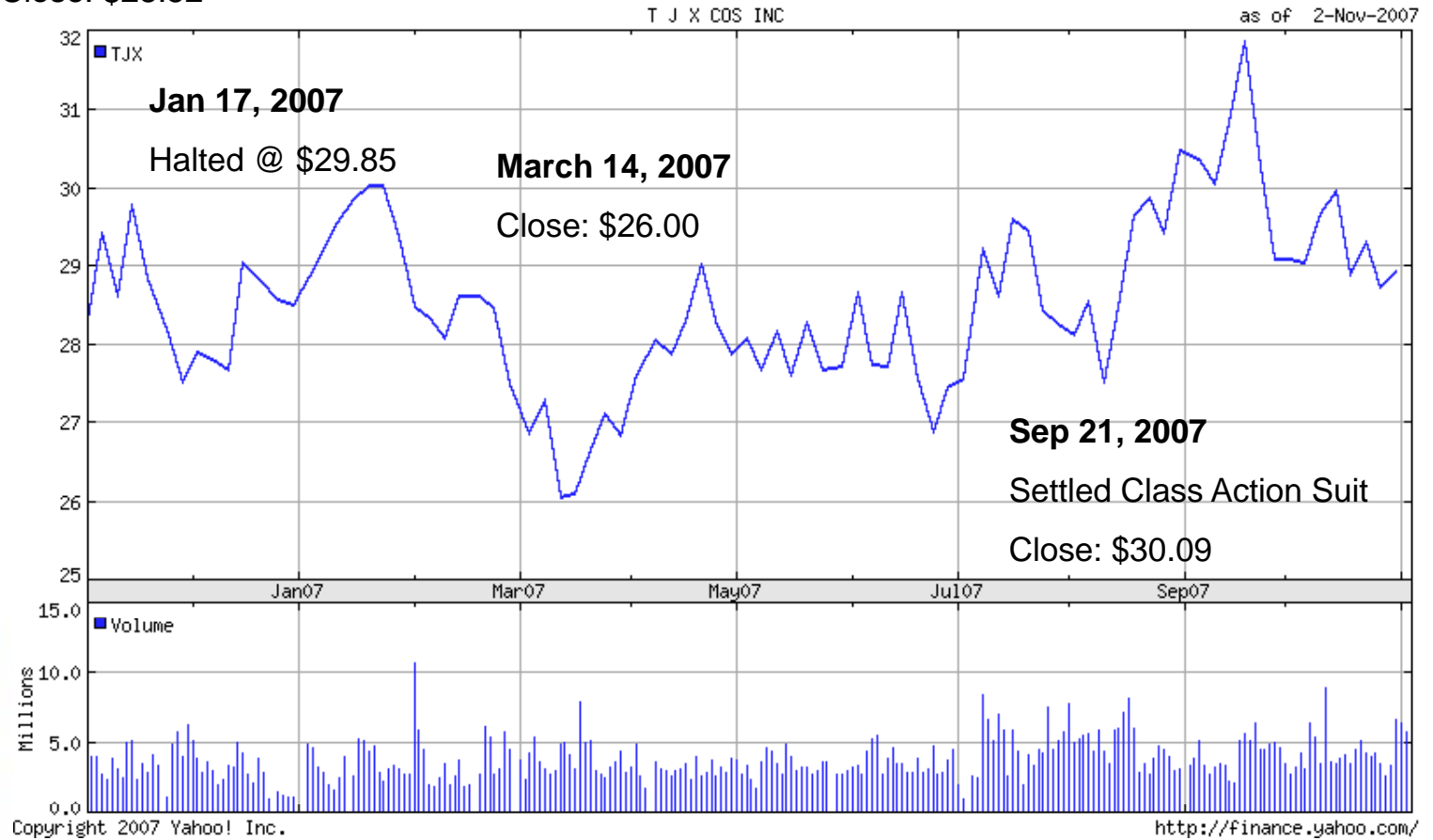


Dec 29, 2006

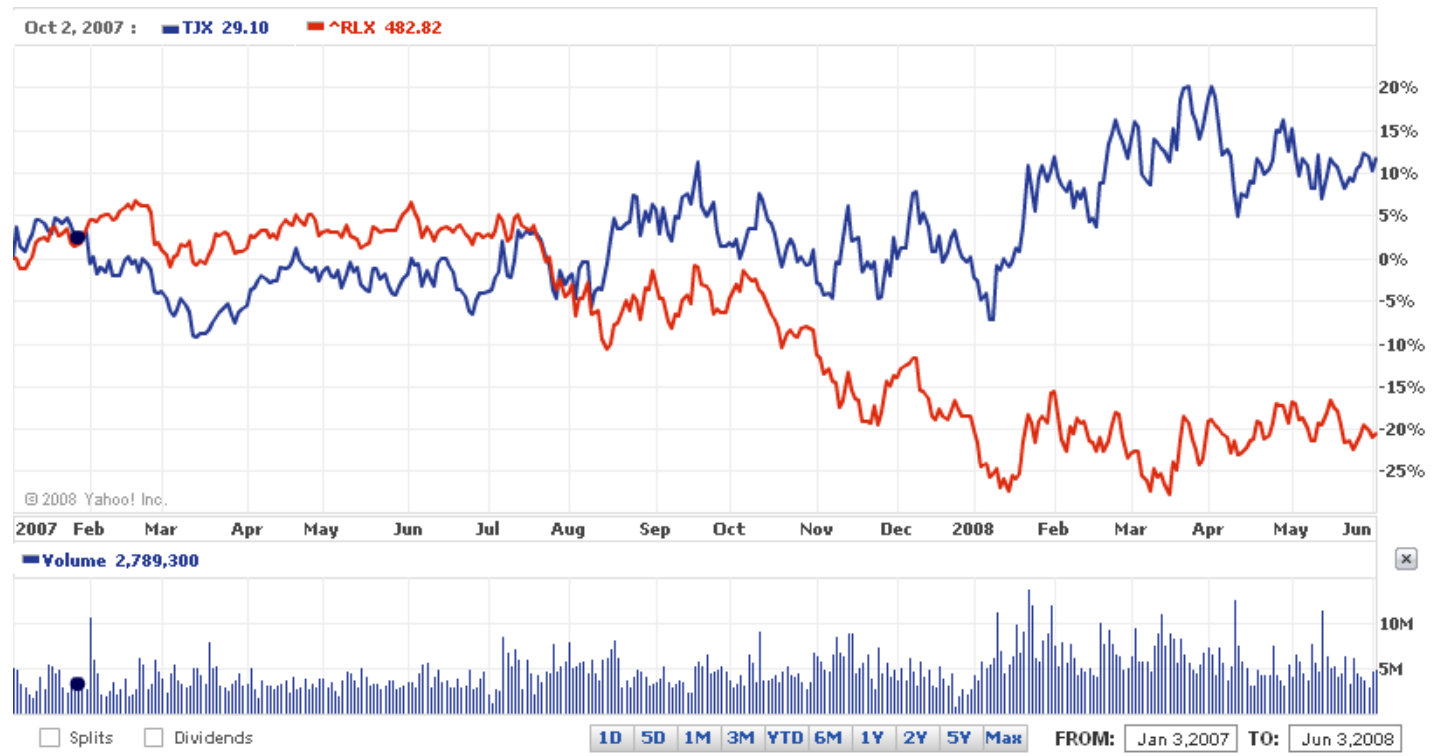
Close: \$28.52

Nov 2, 2007

Close: \$27.77



TJX vs S&P Retail Index 1/1/07 - present



Impact?

- CardSystems
 - Killed by Visa & AMEX using PCI (Oct 31, 2005)
 - Assets sold to PayByTouch
 - "We do not feel like we paid anything like a fire sale price" – CyberSource after signing LOI
 - Assets sold at ~2x multiple; liabilities discharged
 - PayByTouch settled with FTC (Feb 2006)
- TJX
 - Net change in share price: \$-0.75
 - Shares outstanding: 444.62M
 - Lost value: \$333.47M
 - 52 Week pps change: -2.49%
 - Slightly underperformed S&P Retail Index for 6 mos



TJX Now

- June 3, 2003 close: \$32.23
- 52 week high is 34.93
- Poster-child for PCI

Jim Cramer 4/708:

“I like TJX. They're executing... they're doing a great job. It's one of my favorite retailers ...No way am I backing away!”



Thoughts

- There is too much data to protect; we must make the data less valuable
 - Identity information seems to be losing value
 - Likely due to success in “back-end” fraud detection / prevention
- Are economic (dis) incentives aligned with security responsibility? In the event of a breach, do the responsible parties feel the pain?
- Do the data stewards care about breaches?



For More Information

- Workshop on the Economics of Information Security (WEIS)
www.econinfosec.org
- *The economic cost of publicly announced information security breaches: empirical evidence from the stock market*
Journal of Computer Security
Volume 11 , Issue 3 (March 2003)
- *Economics of Information Security*
L. Jean Camp and Stephen Lewis, Editors
2004, ISBN: 1402080891

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