EVENT MODELLING FOR POLICYMAKERS & VALUATION ANALYSTS IN DISRUPTIVE INNOVATION MARKETS: DIGITAL DOWNLOAD STRATEGIES FOR RADIOHEAD'S *IN RAINBOWS* & NINE INCH NAILS' *THE SLIP*

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(Refereed)

'There's an unlimited supply.'

– The Sex Pistols, 'EMI', *Never Mind the Bollocks, Here's the Sex Pistols* (1978)

'Yes, it's pay what you want, including free. Really.'

– Radiohead, *In Rainbows*.com digital download site (2007)

'I think the way [Radiohead] parlayed it into a marketing gimmick has certainly been shrewd. But if you look at what they did, though, it was very much a bait and switch to get you to pay for a MySpace-quality stream as a way to promote a very traditional record sale. There's nothing wrong with that, but I don't see that as a big revolution [that] they're kinda [sic] getting credit for. To me that feels insincere. It relies upon the fact that it was quote-unquote 'first,' and it takes the headlines with it.'

– Nine Inch Nails' Trent Reznor, Triple J's 'Hack' interview (Chartier, 2008).

1. Introduction: Two Market Events & Four Initial Reactions

1.1 Paper Overview & Problem Statement

Market events force journalists, policymakers and valuation analysts to make judgments on the basis of ambiguous and incomplete information. This paper explores why Chris Anderson, Scott Anthony and other strategists applaud Radiohead's *In Rainbows* (2007) and Nine Inch Nails' *The Slip* (2008) as two market events about online digital downloads that might dramatically alter the digital music industry's structure, firms, and business models. I critique Web 2.0 innovation, Freeconomics (Anderson, 2007) and Disruptive Innovation Theory (Anthony, 2007) explanations for the two market events.

Do these market events *actually* validate the strategists' judgments and stances? On closer examination **they lack robustness as predictive and explanatory theories** for Radiohead and Nine Inch Nails' respective decisions to pursue digital download strategies given alternative release options and new entrants in the digital music industry. I suggest this is for several reasons: alternative premises, strategist belief in theoretical frameworks, the potential for blind spots and false reads in the face of information asymmetries and uncertainty, and the difficulty to make reliable inferences about strategic actors in a dynamic competitive landscape or strategic ecosystem. *All* analysts, policymakers and strategists face these challenges: greater self-awareness can lead to more robust analysis, efficient decisions and effective business, market, and strategic intelligence.

1.2 Paper Structure & Data Appendices

Section 1 provides an overview of the two market events and four initial reactions that Anderson, Anthony and other strategists each offered for Radiohead and NIN's online digital downloads. I reframe these **theory-driven deductive judgments** as **contingent beliefs** that will be re-evaluated as new information is introduced throughout the paper.

Section 2 outlines how Disruptive Innovation Theory views industry changes, and then considers relevant *disruptive* innovations in the digital music industry. I extend Anthony's thesis to posit the **Disruptive Innovation Market** as an implicit/latent analytical framework to scope new markets and to evaluate why strategic actors make decisions.

Section 3 sketches an early iteration of the **Disruptive Information Revelation** principle as a way to address the analytical challenges noted above. Appendices **A1** to **A5** summarise the raw data I use as an 'event history data set' (Blossfeld & Rohwer, 2002, p. 3) to formulate the *Disruptive Information Revelation* principle: categories of *trigger events* and risks in the digital music industry (**A1** & **A2**), historical and concurrent deals and events (**A3**), and timelines for Radiohead and Nine Inch Nails (**A4** & **A5**). The categories of *trigger events* are matched across the timelines to discern patterns and trends which might affect the decision-making rationales of strategic actors. I also consider case study limitations, data collection and research design issues, and offer several initial observations.

Section 4 summarises the case study findings. I re-evaluate the first three strategists' judgments from **Section 1** and then suggest that the *trigger events* for Radiohead and NIN's decisions were their concerns about how mergers and acquisitions (M&A) transactions with their music industry labels EMI and the Universal Music Group (UMG) would affect their careers. Radiohead and NIN's concerns *precede* the emergence of a mature Disruptive Innovation Market as the *sole* release channel for major artists' new albums. This section draws heavily on insights from behavioural finance, digital music industry trends, and M&A. Readers with expertise and interest in Bayesian heuristics for decision-making, game theory, information and managerial economics, negotiation and quantitative modelling can consult appendix **A6** for hypotheses and observations that emerged during the case study.

Section 5 suggests future research opportunities and action outcomes for journalists, policymakers, and valuation analysts. I welcome critical feedback from practitioners.

1.3 Two Market Events: Radiohead's In Rainbows & Nine Inch Nails' The Slip

At 5:30 GMT on 10 October 2007 the English rock band Radiohead released their seventh studio album *In Rainbows* as an online digital download. *OK Computer* (1997) had already established Radiohead's critical reputation and cemented their commercial success. *In Rainbows* attracted wider attention and intensive media coverage when Radiohead spurned their long-time music industry label EMI to release *In Rainbows* online direct to fans.

In a Harvard Business Publishing blog, strategist Scott Anthony explained the broader significance of this decision for the digital music industry: 'Instead of distributing *In Rainbows* through traditional mechanisms, Radiohead allows fans to come to its Web site and pay whatever price they feel is appropriate to digitally download the album.' (Anthony 2007).

Radiohead's decision cast the die for other artists to follow. The industrial rock band Nine Inch Nails (NIN) signalled it would follow Radiohead's digital download model. NIN released the instrumental double album *Ghosts I–IV* on 2 March 2008 and unlike Radiohead asked fans to pay for the digital download. NIN's fans were used to remix side-projects and waiting years for a new studio album. NIN then surprised fans and critics alike when it released *The Slip* on 5 May 2008. 'This one's on me,' Reznor explained online.

Radiohead and Nine Inch Nails' digital downloads sent shockwaves through the broader entertainment industry. Both artists had seemingly turned their backs on major music labels: both had industry awards, a strong fan-base and highly profitable tours. Appendix **A3** notes the incumbent music labels now faced competition from new entrants: Starbucks and Live Nation Inc. who made lucrative deals with Paul McCartney, Madonna and rapper Jay-Z.

Did Radiohead's decision mean the incumbent labels' pot of gold was now a digital mirage?

1.4 Initial Reaction #1: Web 2.0 Innovation

Journalists used Web 2.0 innovation as a ready-made analytical framework to explain Radiohead's *In Rainbows* digital download. Whilst not the first band to sell their albums online Radiohead tapped mature Web 2.0 platforms such as Facebook, MySpace, and YouTube. Radiohead's vanguard stance mirrored Web 2.0's potential to create new business models and breakthrough innovations. NIN's Trent Reznor likewise brought a deeper awareness of Web 2.0 with his extensive background in art design, innovative studio recording and production, remixes, digital video editing, and viral marketing campaigns.

Were both artists just 'early adopters' of Web 2.0 or were there other strategic reasons?

1.5 Initial Reaction #2: Freeconomics

Wired's Chris Anderson highlighted Radiohead's *In Rainbows* as an example of a specific Web 2.0 strategy. In Freeconomics (Anderson, 2008) the artist releases free content for the end-user and then builds alternative revenue streams through advertisers and other value chain complementors. Even more than Radiohead's *In Rainbows*, Nine Inch Nails exemplified Anderson's Freeconomics vision because Reznor gave *The Slip* to fans for free.

Why then did Radiohead ask fans to pay for *In Rainbows*? Why did NIN ask fans to pay for *Ghosts I–IV* and then pursue a Freeconomics strategy for *The Slip*?

1.6 Initial Reaction #3: Disruptive Innovation Theory

Anthony is a student of Harvard University professor Clayton M. Christensen who popularised Disruptive Innovation Theory to explain how new technologies alter an industry and why incumbents are slow to embrace change (Christensen, 1997). In his initial reaction Anthony raised several important points: Radiohead used a *market mechanism* for the *In Rainbows* digital download that might commoditise a new business model, the pricing point was cheaper than buying a CD, the strategy targeted non-customers who would download the album from illegal peer-to-peer networks, and Radiohead also served a collector's market by releasing an *In Rainbows* limited edition box set in December 2007 (Anthony, 2007).

Would Radiohead's strategy give them long-term autonomy outside a major label contract, and shakeup the digital music industry as Anthony suggested?

1.7 Initial Reaction #4: New Contract Negotiations & Album Production Costs

I immediately responded to Anthony's thesis (Burns, 2007). Frank Zappa provided an historical precedent in the late 1970s and early 1980s with his 'beat the boots' series to counter bootleggers. I suggested Radiohead used Web 2.0 strategically to lobby an audience during new contract negotiations with major music labels, and that any online revenues earned would defray Radiohead's album production costs. This seemed a more sensible strategic rationale based on my past industry experiences, and a stance influenced by Steve Albini's influential study of the inter-relationship between label contracts, album costs and revenue shares (Albini 1993). Weeks later Radiohead's management partially validated my reaction when they revealed that *In Rainbows* would receive a CD release in January 2008.

2. Disruptive Innovation Markets

2.1 'Noise' Traders & Disruptive Innovation Theory

Whilst each of the four initial reactions above suggested different variables they all shared a **common assumption**: Radiohead's *In Rainbows* experiment would lead to new business models, new markets and possible industry structural change. One reason for our variance was that the 'signal' of these changes must be separated from the 'noise' of analysts, global news flows and competitive markets (Black, 1986). This 'signal/noise' distinction partly explained why Radiohead fans had different pricing points for *In Rainbows* and how event arbitrageurs and other ‘noise’ traders make bets on M&A and market volatility.

Anthony turned to Disruptive Innovation Theory as his preferred framework to filter out this ‘noise’ from the digital download ‘signal’. He had previously applied this framework to competitive, market and structural changes in other industries: healthcare, aviation, semiconductors, global strategy, telecommunications, and open source software (Christensen, Anthony & Roth, 2004). Interestingly, many of these examples were highly cyclical industries with powerful incumbents, extensive regulation, long investment horizons and high risk-returns for new investments.

Christensen’s original insight from his PhD study on the hard-drive industry was to distinguish two strategic options for new market growth in a competitive landscape (Christensen, 1997). *Sustaining* innovations appealed to incumbents’ customers through additions to existing products and services, and line extensions to popular market segments. In contrast, *disruptive* innovations identified new markets often through customers that the incumbent had overlooked, decided were unprofitable, or who desired alternatives to existing products and services.

Christensen and collaborators have recently expanded Disruptive Innovation Theory to examine the innovation pipeline barriers in incumbent firms (Christensen & Raynor, 2003) and education sector innovation (Christensen, Johnson & Horn, 2008). Christensen’s framework provides ‘noise’ traders with ‘signals’ for pre-emptive strategies in new markets.

2.2 Reshaping the Digital Music Industry’s Competitive Landscape

Anthony and the other strategists were aware of *disruptive* innovations in the digital music industry. Napster’s illegal download network and its peer-to-peer successors was the most well known in technology circles: it triggered a ‘value migration’ from industry conglomerates to fans which some artists embraced and others fought (Slywotzky, 1996). In response, the major labels feared a looming financial collapse (PBS *Frontline*, 2004).

Other forces further reshaped the digital music industry’s competitive landscape: a wave of conglomerate mergers and the resurgence of independent artists (Gordon, 2005). New ‘complementors’ and substitutes such as Starbucks and Live Nation Inc. emerged throughout the industry’s value chain in distribution, music labels and touring (Brandenberger & Nalebuff, 1996). Appendix **A3** discusses these new entrants and their competitive strategies.

To-date the digital music industry’s incumbents have closely followed Christensen’s *sustaining* innovations in response to new competitive, strategic and technological threats. Cost management targeted marketing/promotional expenses and unprofitable mid-level artists. The Recording Industry Association of America launched a high-profile campaign on digital piracy. Incumbents developed *sustaining* innovations to halt declines in CD sales: the Dualdisc format and bonus DVD content to halt declines in CD sales. The incumbents aimed with *sustaining* innovations to maintain their market power, dominate consumer segments and erect barriers to new entrants (Damodaran, 2008, pp. 355–356). However, as Christensen and Anthony both predicted, it is the new entrants and the artists who are now the ‘early adopters’ and developers of *disruptive* innovations in the digital music industry. Media coverage favourably positioned Radiohead and Nine Inch Nails as catalysts in this vanguard.

2.3 Disruptive Innovation Markets

Disruptive Innovation Markets are implicit and latent in Christensen’s Disruptive Innovation Theory which has focussed primarily on industries. Others misinterpret Christensen’s work as concerned with ‘killer app’ technologies and ‘first mover advantage’ competition in a strategic ecosystem. Below I clarify *Disruptive Innovation Markets* as a conceptual framework and stance to re-examine Radiohead and NIN’s digital downloads.

Disruptive Innovation Markets are markets that coalesce around *disruptive* innovations: new products and services, novel contexts of use, industry white-spaces or strategic foci. An emergent *Disruptive Innovation Market* exists as a 'chaotic' boundary condition or possibility space at the frontiers of an organisation's self-image and strategic execution. *Disruptive Innovation Markets* may be new *Blue Ocean* markets (Kim & Mauborgne, 2005). Or they may be perturbations in the strategic landscape that generate parallel or sidereal markets to existing competitive rules and industry structures. Complexity theory, soft systems models, quantum cosmology, and causal/temporal models with cyclical/spiral dynamics all offer relevant exploratory frameworks to conceptualise *Disruptive Innovation Markets* in a competitive landscape, industry white-space or strategic ecosystem (Beinhocker, 2006). This requires further conceptual, formulation and implementation research.

The emergence of a *Disruptive Innovation Market* does not necessarily ensure its long-term stability, profitability or viability. They still face the traditional challenges of markets: externalities, gridlock, regulatory challenges, adverse selection, information asymmetries and the potential for market failure (Akerlof, 1970; McMillan, 2002; Heller, 2008).

3. Event Modelling Framework: Disruptive Information Revelation

3.1 Quantitative Event Modelling Frameworks: Research, Design & Construction Issues

Event modelling frameworks are primarily quantitative and use quantitative spreadsheet models constructed from known factors (Ragsdale, 2007; Blossfeld & Rohwer, 2002; Box-Steffensmeier & Jones, 2004). However, for reasons discussed below this approach was not used primarily in this case study, although it could be used for future case research.

Another approach to event modelling is to identify the relevant causal factors based on pre-event and post-event distinctions in risk quantification models (Condamin, Louisott & Naim, 2006). Appendices **A1–A2** attempt to do this for categories, **A3** considers concurrent deals and events in the digital music industry, and **A4–A5** outline the relevant decisions and events by Radiohead and NIN as strategic actors. From this, it is possible to construct an 'early warning' system for event-responsive market and strategic intelligence (Busch, 2007; Harding 2004, pp. 132–135). Stress-testing the diversification, risk-return and volatility components of investment portfolios are a further commercial application (Damodaran, 2008, pp. 77–78; Mehrling, 2005, pp. 267, 291). This approach would bring cultural industry and new media theories into the era of 'macro' global hedge funds and emerging markets.

3.2 Limitations of the 'Paired' Case Study & Quantitative Event Modelling Frameworks

The case study has some important limitations that affect its analysis, frameworks and conclusions. First, this retrospective analysis of Radiohead and NIN could include **hindsight** and **survivorship biases** (Blossfeld & Rohwer 2002: 20; Taleb 2005). Radiohead and NIN's strategies look pre-planned to industry observers yet may actually have been 'ad-hoc', 'emergent' or improvised strategies that were just lucky (Mintzberg, 1987; Taleb, 2005).

Second, this is a **black box** analysis as much of the key information is missing that would enable strategists to make reliable judgments about Radiohead and NIN. The future release of music label contracts, notes on meetings and negotiations or in-depth interviews of the various strategic actors could lead to different or revised interpretations. Radiohead and NIN have private production companies whose mark-to-market value is not reflected in public and transparent information such as a stock price. Reznor alludes to this in naming his enigmatic new company The Null Corporation.

Third, much of this paper is based on secondary information and contextualised non-factual data such as opinions which the quantitative approaches above cannot easily model (Blossfeld & Rohwer, 2002, p. 19; Howson, 2003, p. 91). Another factor is that all relevant strategic actors must be considered in evaluating the plausible and probable outcomes of market strategies (Bradley & Meek, 1987, p. 173). Therefore, one reason to reject the first three reactions in **Section 1** is that Anderson, Anthony and other strategists did not consider relevant strategic actors: label producers, management teams, music industry lawyers, venture capital investors, digital media conglomerates, and illegal/underground economies.

How did these case study limitations now affect my use of quantitative event modelling frameworks? I initially planned to track how the events in appendices **A4–A5** would directly affect the stock prices of EMI and Vivendi SA, the parent company of UMG (Benninga, 2008, p. 371). The concurrent deals and events in appendix **A3** would provide an estimate of what financial analysts term *Beta*: the correlation of stock returns to the broader market or sector. I then queried Google Finance, Yahoo! Finance and the US Securities & Exchange Commission's Edgar database. However this revealed major information gaps: Terra Firma Capital Partners had acquired EMI and then delisted the entertainment conglomerate from the London Stock Exchange. Vivendi SA's stock price was too complex to isolate UMG's performance alone. SEC filings and company annual reports also did not specifically mention the artists. Radiohead and NIN each preferred media coverage and Web 2.0 content to financial information about their privately held companies.

These information gaps meant that quantitative event modelling frameworks could not be used for this 'paired' case study; however they did inform the research design and approach. Future case studies with different strategic actors could use these quantitative methods.

3.3 The *Disruptive Information Revelation* Principle

Disruptive Information Revelation provides a guiding principle of *inductive logic* to deal with the judgment variations, market 'noise' and methodological limitations. In order to limit the potential for blind spots and false reads the strategic analyst must actively consider at least five factors: historical trends, unfolding events, future probabilities, assumptions that are contingent beliefs, and the inferences made from and by an explanatory framework.

Disruptive Information Revelation thus has a triple meaning: it is a guiding principle to assess *disruptive* innovations in order to validate the emergence of a *Disruptive Innovation Market*; it directs attention to the phenomenological processes of inference, judgment and evaluation; and it describes the dynamic and fluid structure of the very information sought. Nassim Nicholas Taleb's sceptical epistemology exemplifies this approach (Taleb, 2005; Taleb, 2007). This paper also illustrates *Disruptive Information Revelation* through comparison of the four initial reactions and my final conclusions based on new market data.

There are seven phases to *Disruptive Information Revelation*. A strategic actor's *announcement* (1) prompts *anticipation* (2) in target audience(s) and initial *possibility* scoping (3). The *trigger event* (4) generates *initial theories* (5) which may then be revised after the *revelation* of new information (6) until a more accurate *judgment* is reached (7). Appendix **A6** highlights the role of Bayesian probabilities, networks and econometrics. Appendices **A3–A5** provides events for analysis. *Disruptive Information Revelation* may also feature in digital media debates about Gartner's 'hype' cycle as a predictive framework, 'vapourware' announcements on new products and services which are never released, and the failure of 'silver bullets' to deliver on productivity promises in information technology systems (Brooks Jr. 1987). *Disruptive Information Revelation* is only sketched above; further development is required, notably to explore Bayesian and combinatorial game theory applications.

3.4 Initial Observations on the 'Paired' Case Study

I chose Radiohead and Nine Inch Nails for the 'paired' case study due to extensive media coverage of *In Rainbows* and *The Slip*. However, *Disruptive Information Revelation* suggests three further historical factors: **broadly similar career arcs**, the mutual importance of **artistic control**, and different experiences in **adverse selection** similar to buying a 'lemon' second-hand car, hiring a difficult employee, or facing an unpreventable market failure (Akerlof, 1970).

Radiohead and Nine Inch Nails share four key phases in their broadly similar career arcs. They achieved early commercial success: Radiohead's single 'Creep' from *Pablo Honey* (1993) and NIN's *Pretty Hate Machine* (1989) and Grammy-award winning EP *Broken* (1992). Critical acclaim followed for NIN's *The Downward Spiral* (1994) and Radiohead's *OK Computer* (1997). Then, each artist refused to take the next step in the digital music industry. Instead they each took unexpected career turn: Radiohead's *Meeting People Is Easy* (1998) documented why it refused to follow U2 into sold out stadium tours, and despite internal feuds opted to record *Kid A* (2000) and *Amnesiac* (2001). NIN's Trent Reznor spent five years recording the double album *The Fragile* (1999). Later, both artists returned to commercial success and critical favour: Radiohead's *Hail To The Thief* (2003) and NIN's *Year Zero* (2006). Their new albums were amongst the most anticipated for 2007–08.

Both artists have developed collaborative expertise, end-to-end processes, and internal resources to maintain artistic control. Radiohead and NIN's early success forced them to confront the digital music industry's standard operating procedures on production and recording costs, touring, promotional budgets, and merchandising deals. The unexpected career turn provided an *incubation space* for creativity and self-development rather than the Faustian bargain of greater success controlled by the major labels and media outlets. Over their extensive careers, both artists had developed strong audience bonds that now enabled them to maintain a vanguard position in the face of adversity. It also drove Radiohead and NIN to innovate their live stage shows with lighting and stage design (Gardiner, 2008).

Radiohead and NIN triumphed over the 'adverse selection' in the digital music industry, although NIN's Trent Reznor almost didn't. Critics interpreted Reznor's early music as existential angst fuelled by a dark imagination (Burns, 1999). But the threats went beyond the usual rock 'n' roll excesses of alcoholism and drug abuse which affected band line-ups, tours, and delayed the delivery of new albums UMG's label Interscope Records. US conservative pundits attacked Reznor over his soundtrack for Oliver Stone's film *Natural Born Killers* (1994) and his co-producer role for Marilyn Manson's controversial album *Antichrist Superstar* (1996). Appendix **A5** notes several other incidents including Reznor's successful US$3 million lawsuit against former manager John Malm, Jr.

These initial observations provide an historical context for the case study findings below.

4. Case Study Findings

4.1 Revisiting Initial Reaction #1: Web 2.0 Innovation

As noted above Radiohead and Nine Inch Nails were 'early adopters' of Web 2.0 platforms and technologies. However the data suggests that both artists used Web 2.0 strategically to develop autonomy in the album production and recording process. They built robust fan communities with an awareness of how Facebook, YouTube and social network sites tapped power laws (Damodaran, 2008, p. 79). In doing so, they created 'options and alternatives (Thompson, 2005, pp. 160–161) to their labels' contract offers and standard processes. Importantly, both Radiohead and NIN spent years before Web 2.0 developing their multimedia skills and equipping home studios. Reznor's incubation period established his core competencies in Web 2.0 platforms prior to NIN's album *Year Zero* (2007) which used laptop production, remixes, and a viral marketing campaign.

Web 2.0 innovation proponents also missed another dimension: cost management as a bargaining tool in major label negotiations. Traditionally, major label contracts can force artists to pay for recording budgets (studio producers, engineers and mastering) and marketing costs (artwork, promotional campaigns, music video clips) as expense items before revenue recognition (Albini, 1993). Appendix **A4** shows how Radiohead pursued this in home studio recordings for *In*

Rainbows: they nurtured a collaborative team with expertise, paid the album production and recording costs upfront, and ignored expensive music video clips. Appendix **A5** suggests NIN's *The Slip* was Reznor's strategy with an EP-length album to raise fans' awareness of NIN's new tour, and to recoup preproduction and rehearsal costs later through tour tickets, and merchandise sales. Reznor's later decision to release *The Slip* on CD is an example of Real Options methodologies in investment, project and valuation decisions.

During a 2007 Australian tour Reznor conducted pricing surveillance and discovered UMG had not factored currency changes into its Australian retail prices. Reznor then publicly told fans at the tour's concerts to download NIN's albums from illegal peer-to-peer networks rather than buy them at inflated prices. Reznor's new company The Null Corporation is plausibly a corporate structure to maintain control over NIN's creative output and to minimise the production, recording and tour expenses that a major label would charge him. The evidence in appendix **A5** for this includes Reznor's negative experiences with Leaving Hope/TVT Music and his Interscope label Nothing Records. These experiences have motivated Reznor to adopt a more risk-seeking stance than Radiohead, and to make statements which might have posed reputational risks to other artists.

Many so-called Web 2.0 innovations are neither original nor technologically dependent. Simon Reynolds demonstrates that 'new wave' and 'post-punk' artists (1978–1984) actually developed many of the business models and social network strategies now credited as Web 2.0 innovations (Reynolds, 2005). The digital music industry has a long tradition of artists who adopt guerrilla and underground strategies. Web 2.0 proponents could learn much from these precursors, and create a richer creative vision.

4.2 Revisiting Initial Reaction #2: Freeconomics

Anderson's Freeconomics model (Anderson, 2008) hinted that strategists need to consider the role of third parties in the 'buzz' of Radiohead and NIN's releases. It's a pity that Anderson did not explore this further nor augment his model with game theory insights on the interdependence of strategic actors. An obvious example would be Radiohead and NIN's 'incentive conflicts' with EMI and UMG who as publicly traded companies had a more short-term time horizon than either artist (Thaler & Sunstein, 2008, p. 98).

Radiohead embraced Anderson's Freeconomics model obliquely by allowing fans to choose their own price for *In Rainbows*. Radiohead's management then used the 'buzz' to negotiate a more favourable distribution deal with music labels in different international territories.

NIN's Reznor was more risk-averse: he made fans pay US$5 for *Ghosts I–IV* and wanted to maintain control over the decisions about price points for NIN albums. A more cynical view is that Reznor adopted Freeconomics to ensure *The Slip*'s digital download was an event, to signal his break from UMG, and as a Real Options strategy to delay a traditional CD release.

These outcomes suggest two extensions to Anderson's model: strategic actors will have their own reasons for a Freeconomics strategy within their own ecosystem, and can have an experience/learning curve in strategy formulation, adoption and execution. It also provides a new way to view Web 2.0 innovations: separate yet overlapping and possibly coevolving markets in new business platforms, content platforms, programming languages, publishing and user-driven content, rather than a Kuhnian paradigm shift in the Internet's coevolution.

4.3 Trigger Events for Radiohead & NIN's Digital download Strategy

Radiohead, Paul McCartney and other artists signalled in mid-2007 that they had issues with their current label EMI. NIN's label at the time was UMG's Interscope. EMI backed a leveraged buyout bid by Terra Firma Capital Partners on 21 May 2007 and EMI's shareholders approved the deal on 1 August 2007. I then discovered that France's Vivendi SA had acquired Universal Music Group in 2000 (Giffin, 2002, p. 81). Appendices **A1–A2** summarise some general categories for *trigger events* and risks in the digital music industry.

Rather than the **Section 1** initial reactions the primary *trigger events* for Radiohead and NIN were private equity firms who acquired EMI and UMG (Damodaran, 2008, pp. 124, 249). Radiohead and NIN now faced a personal 'strategic inflection point': how would this M&A affect their careers and bargaining power in negotiations? (Grove, 1999). Although it's unclear if either artist had an escape clause in their contracts, both were aware of past high-profile disputes between artists, their management and music industry labels, which appendix **A3** summarises. Historically, similar disputes arose near the end of major label contracts. Artists engaged in media campaigns and shareholder activism to improve their bargaining stance (Burns, 2002). The artists consciously used metaphors of legal contracts as slavery and music labels as psychic prisons (Morgan, 2006, pp. 230, 298). The artists contended that music industry labels forced them into a corner through negotiation strategies based on *power*-based tools: 'fiat, force, coercion, and threats' (Christensen, Curtis & Horn, 2008, p. 186). Narratives about these past disputes provide a reliable framework to situate artist strategies and unfolding *trigger events* which would otherwise be media 'noise'.

In an M&A transaction the first 100 days are critical for the acquirer to perform cultural due diligence and successful post-acquisition integration (Howson, 2003, p. 107). Tellingly, Radiohead left within the first 100 days of Terra Firma Capital Partners' acquisition of EMI. Although Reznor left UMG much later his career experiences in appendix **A5** suggest he was the 'opinion leader' type who will usually leave if integration fails (Gendron, 2004, p. 89). Radiohead and NIN also had strongly held normative beliefs about their creative work and how music labels should work. They were therefore the very stakeholders who would probably leave if EMI and UMG's acquirers were in conflict with the artists' normative beliefs or the labels' organisational culture prior to acquisition (Carleton, 2004, pp. 11, 36, 134–136). Finally, if we accept that NIN and Radiohead are *disruptive* innovators compared with music industry labels who are *sustaining* innovators then the artists' 'separation' fits Christensen's belief that this is 'the one viable long-term solution' to bring *disruptive* innovations to market (Christensen, Curtis & Horn, 2008, pp. 190–191).

4.4 Evaluating the M&A Errors and Strategic Responses of EMI & UMG

How did EMI and UMG respond to Radiohead and NIN and what M&A errors did the major labels each make? Both labels made threats and ultimatums as the artists neared the end of their contracts and entered 'label shopping' periods for a new contract with a music label, major or indie (Thompson, 2005, pp. 225–226). EMI's probable errors of stakeholder communication and leadership created a 'window of opportunity' for Radiohead to leave (Cianni, 2002). In retaliation, EMI adopted a short-term strategy of 'ambush' marketing to gain maximum publicity from Radiohead's *In Rainbows*. UMG's response was more difficult to uncover and probably reflects a long-term battle of wills with NIN's Trent Reznor. Appendices **A4** and **A5** summarise the relevant *trigger events* for Radiohead and NIN.

Radiohead's defection to a new label suggested that Terra Firma Capital Partners made two well-known errors in its EMI acquisition: the M&A integration team did not develop strategies to mitigate the loss of key artists with valuable intangible assets, nor did the team overcome the organisational barriers to change (Christensen, Curtis & Horn, 2008, p. 190).

Radiohead's statements in appendix **A4** revealed it had 'different perceptions and expectations' to Terra Firma as an EMI stakeholder (Carleton, 2004, pp. 74–75). Terra Firma's acquisition process created a *trigger event* for Radiohead, Paul McCartney and other artists: a 'culture clash' between EMI's new owners and the artists (Carleton, 2004, p. 13). Faced with uncertainty, knowledgeable about past disputes with major labels, and also aware of *disruptive* new entrants, Radiohead adopted a 'reactive approach' to Terra Firma similar to the 1980s wave of leveraged buyouts in the banking and financial sector (McManus & Hegert, 1988, p. 47). Terra Firma and EMI might have possibly avoided these outcomes through 'cultural due diligence' (Carleton, 2004, p. 53) and 'transition planning' for such 'key constituents' (Gendron, 2004, pp. 68–69). To avoid 'a narrow approach to cultural due diligence' (Howson, 2003, p. 4) in the future M&A integration teams could apply a *valuation factor* to the target company's balance sheet for artists who pose a defection risk.

5. Conclusion: Cash from Chaos, Dollars from Disruption

‘*In Rainbows* is no longer available as a download.’

− Radiohead.com (2008)

‘I have been trying to t-t-t-t-t-t-tolerate you [sic] / I will use my voice / I will use my fist / To destroy / Everything I can.’

− Nine Inch Nails, ‘Demon Seed’, *The Slip* (2008)

‘Only power tools are reliably effective in low-agreement situations.’

− *Disruptive Class* (Christensen, Curtis & Horn, 2008, p. 187)

5.1 Findings Summary & Significance

This paper examined the *trigger events* surrounding Radiohead’s *In Rainbows* (2007) and Nine Inch Nails’ *The Slip* (2008) and their digital download strategies. Three initial reactions were highlighted: Web 2.0 innovation, Freeconomics and Disruptive Innovation Theory. I argued that each reaction offers a partial explanation despite the various insights gleamed from their theory-driven deductive judgments. I noted that a complete explanatory theory needs to include broader industry trends and also to consider strategic actors’ decisions.

Disruptive Innovation Markets were briefly sketched as a conceptual framework and stance. Insights from quantitative event modelling frameworks and the *Disruptive Information Revelation* principle were then used to re-examine the three initial reactions and the media record for Radiohead, Nine Inch Nails and their respective former labels EMI and UMG. I contended that the probable *trigger events* for the artists’ defection were their concerns about EMI and UMG-related M&A transactions. Radiohead and NIN were in ‘label shopping’ periods with heightened anxieties about a ‘low-agreement situation’ for artistic control and new contract negotiations. To hedge against this volatility each artist adopted digital download strategies for their respective new albums and diverged in their strategic execution.

A ‘soft power’ approach leveraged Web 2.0 innovation and Freeconomics to mobilise fans, buffer the artists against market retaliation from their former labels, and improve their negotiation position with alternative labels through increased market visibility.

Unintended outcomes have since emerged in the digital music industry. Radiohead and NIN used Christensen’s *disruptive* and *sustaining* innovations simultaneously to appeal to different markets: end-users who wanted the immediacy of an digital download (*disruptive*) versus those who waited for a traditional CD with bonus content (*sustaining*). Yet it remains to be seen if this was simply a smart negotiation ploy to preserve autonomy, a new online model for time-based competition, or if the two *trigger events* will inaugurate a new *Disruptive Innovation Market*. Whatever outcomes arise Trent Reznor’s period of ‘toleration’ as a for music industry labels excesses is over.

5.2 Future Research Opportunities

This paper highlighted several future research opportunities for journalists, policymakers and valuation analysts. The following section used the US Army’s ‘after action’ review process (Darling, Parry & Moore, 2005) to formulate some ‘actionable’ insights.

The approaches in this paper could be applied to different case studies, industries and decision-making environments. Quantitative event history modelling has promise for evidence-based case studies, particularly in the business, finance and digital media sectors where public information provides greater transparency. *Disruptive Innovation Markets* and the *Disruptive Information Revelation* principle outlined in this paper need further development. Valuation methodologies could be developed and integrated into areas such as digital media coverage, M&A due diligence, investment portfolio construction, event arbitrage, Real Options analysis, and institutional risk management.

Journalists can build on the *Disruptive Information Revelation* principle through self-reflective and practice-based research. In particular, online journalists who frame their conclusions as *contingent beliefs* can revise them with blog publishing systems when new information is *revealed* to avoid *hindsight* and *survivorship biases*. Journalists who cover Web 2.0 and other information technology trends would do well to adopt Nassim Nicholas Taleb's sceptical epistemology when covering new product and service announcements or other significant claims (Taleb, 2005; Taleb, 2007).

Policymakers will play a vital role in developing future *Disruptive Innovation Markets*. This framework could build on existing insights from market design, anticipatory regulation, antitrust and competition policy, and innovation capabilities. Industry dynamics and market structure may embody new forms. To prevent market failure, policymakers will need to use a more diverse policy ecosystem and to tap open commons spaces to encourage debates.

Valuation analysts have the opportunity to establish 'thought leadership' in M&A due diligence, event arbitrage and risk management. *Disruptive* innovations already create a gap between market perception and risk repricing. The *Disruptive Information Revelation* principle identifies this opportunity timeframe: between a firm's announcement, its go-to-market strategy, and end-user uptake. Areas where valuation analysts could develop entrepreneurial models include 'hurdle' measures for project financing, specific events and risks in the due diligence phase of an M&A, strategic execution capabilities for time-based competition, and the stress-testing required to dominate existing or to create new *Disruptive Innovation Markets*. Appendix **A6** scopes some initial approaches to develop *disruptive* valuation methodologies.

APPENDIX A1: TRIGGER EVENTS FOR THE DIGITAL MUSIC INDUSTRY

A2.1 Dependent Variable for Radiohead/NIN Study

- Artist defects from entertainment conglomerate and/or music industry label

A2.2 Independent Variables for Trigger Events in the Digital Music Industry

A2.2.1 Artists

- Artist engages in 'label shopping' near the end of a major label contract
- Artist uses 'contract breaker' release to end a contract (a 'contract breaker' is usually a live album, greatest hits album, or a B-sides compilation)
- Artist signals public dissatisfaction with music industry label (contract, marketing, album distribution)
- Artist complains to media about a music industry label's unpaid royalties from ancillary markets and digital media sources
- Artist breaks up after public dissatisfaction with a music industry label
- Artist signs to a subsidiary label in an entertainment conglomerate
- Artist experiences a major shift in status hierarchy due to commercial and/or critical success

A2.2.2 Entertainment Industry Conglomerates & Music Labels

- Music industry conglomerate acquires subsidiary label and engages in post-acquisition integration without cultural due diligence
- Music label and/or entertainment gains new management and/or CEO

- Music label announces ‘downsizing’ or similar cost-cutting strategy
- Music label does not alter investment guidance on future profits
- Music label has execution problems with an artist’s release

A2.2.3 Media

- Media coverage reframes the artist as a major star or artistic influence
- Media outlets spread rumours on artist-label negotiations

APPENDIX A2: GENERIC RISKS FOR THE DIGITAL MUSIC INDUSTRY

A3.1 Market

- Continuous market risk from changing consumer sentiment and macroeconomic cycles

A3.2 Firm

- Firm-specific risk for music industry labels
- Failure of post-acquisition integration and massive layoffs (Lajoux 2005: 358–359)
- Stakeholders revolt against M&A outcomes (Lajoux 2005: 372)

A3.3 Corporate Finance

- Distressed depreciation of marketing, intangibles and goodwill (Lajoux 2005: 164–165)
- Artist escalates a dispute with music industry label over royalty payments (Howson 2003: 198)

A3.4 Risk Management

- Managers ‘game’ the music industry label’s internal risk measures such as Value at Risk, Real Options, Black-Scholes, decision trees, or scenario analysis (Damodaran 2008: 223)
- Senior decision-makers in the music industry label view risk as a cost structure rather than as integral to effective strategy execution

A3.5 Technology Risks

- Path dependent ‘lock-in’ of industry platforms, legacy systems and information systems
- Peer-to-peer networks that enable digital piracy in an ‘anarchical’ international environment

A3.6 Intellectual Property

- Intellectual Property due diligence and property rights disclosure (Howson 2003: 195–196)
- Litigation risk including failure of uniqueness and sufficiency test for intellectual property and intangibles (Howson 2003: 197–199)
- Artist escalates dispute with music industry label over contract specified delivery
- Artist and/or music industry label initiates litigation over artist contract terms, licensing, merchandising, patents and trademarks (Howson 2003: 256–257)
- Firm-specific liabilities and exposures for a music industry label (Giffin 2002: 83–84)

APPENDIX A3: A SELECTIVE LIST OF MUSIC INDUSTRY DEALS & EVENTS

15 July 1975	David Bowie signs an infamous contract with MainMan's Tony DeFries; Bowie devises Bowie Bonds securities in 1997 to raise US$55 million so he can buy back the song rights from DeFries
13 July 1985	Bob Geldof's Live Aid concerts raise money for Ethiopian famine relief; Mengistu Haile Mariam's corrupt government diverts much of the money for his army in the Ethiopia-Eritrea war
1993	Prince changes his name to Love Symbol or 'The Artist Formerly Known As Prince' during a protracted legal battle with Warner Bros., and releases 'contract breaker' albums from 1994 to 1996
1994	Guns 'n' Roses begin work on their fourth studio album *Chinese Democracy*; production costs blow out to US$12 million; *Chinese Democracy* remains unreleased as of September 2008 despite Internet leaks, band line-up changes, lawsuits, and media rumours
22 June 1994	George Michael loses a high-profile lawsuit against Sony Corporation to be released from the 'professional slavery' of a 15-year contract
1995	Sting sues his ex-accountant Keith Moore who stole £6 million
2000	King Crimson records its US and European tours and launches the Bootleg TV venture to promote authorised bootlegs for fans
2000	Pearl Jam releases authorised bootlegs of its live tours
2000	Metallica's Lars Ulrich participates in a music industry lawsuit against Napster; fans retaliate when Ulrich releases the names of illegal downloaders; Ulrich debates with Public Enemy's Chuck D
11 April 2001	Elton John loses US$30 million lawsuit in the UK's High Court against former manager Andrew Haydon and former accountants PriceWaterhouseCoopers; John has to pay US$12 million in costs
2001	EMI pays Mariah Carey US$28 million to leave the major label after poor sales of her album *Glitter*; EMI 'downsizes' its marketing staff
2004	Starbucks releases Ray Charles' *Genius Loves Company* album
2004	Joe Berlinger & Bruce Sinofsky's documentary *Some Kind of Monster* reveals Metallica's internal feuds including disagreements with QPrime Management and US radio networks over promotional campaigns
13 January 2005	Manhattan Federal Court dismisses David Ellefson's US$18.5 million lawsuit against Megadeth's Dave Mustaine over song credits, merchandising deals, studio recording costs
16 May 2007	Paul McCartney defects from EMI to Starbucks for his album *Memory Almost Full*
14 August 2007	Madonna announces a US$120 million dollar deal with concert promoter Live Nation Inc., and defects from Warner Bros.

19 February 2008	Apple iTunes releases Nike's 'Better Than I've Ever Been' helmed by rappers Kanye West, Nas and KRS-One and produced by Rick Rubin
3 April 2008	Rapper Jay-Z is rumoured to sign a US$150 million dollar deal with concert promoter Live Nation Inc., and leaves his position as president of the Def Jam music label
21 June 2008	Live Nation Inc. CEO Michael Cohl resigns over internal disputes about high-profile 'Live 360' deals with Madonna and Jay-Z
July 2008	Shakira signs a 'Live 360' deal with Live Nation Inc. despite still owing two albums to Sony BMG
11 July 2008	Ben Folds leaks six 'fake' bootlegs as a pre-emptive move before his album *Way To Normal* is released in September 2008
21 July 2008	Proctor & Gamble announces partnership with Island Def Jam to launch the TAG record label for brand and marketing campaigns
22 July 2008	London & Co. sues Courtney Love alleging she dishonoured an oral contract when Love sold 25% of Nirvana's publishing catalogue in 2006 for US$50 million; Love claims entourage stole US$20 million
25 July 2008	The Rolling Stones defect from EMI to Universal Music Group
11 August 2008	The Allman Brothers file US$10 million lawsuit against UMG alleging 'digital exploitation' over non-payment of royalties
13 August 2008	Rapper Jay-Z claims his Live Nation Inc. deal 'is not falling apart'
15 August 2008	Fan leaks four new U2 songs to YouTube after hearing Bono's stereo
3 September 2008	Metallica's ninth studio album *Death Magnetic* is leaked to peer-to-peer networks after a French retailer sells it prior to the 12 September global release date

Public Sources: *Rolling Stone*, *The New York Times*, *The Wall Street Journal*, Wikipedia

APPENDIX A4: RADIOHEAD TIMELINE FOR *IN RAINBOWS* (2007)

Mid-Feb. 2005	Radiohead begin work on their seventh album
August 2005	Radiohead begin recording sessions for as yet unnamed album
Feb.–April 2006	Radiohead decide to work with new producer Mark Stent
May–June 2006	Radiohead tour United States and Europe to play new songs live
August 2006	Radiohead play several European festivals
October 2006	Radiohead reconvene with producer Nigel Godrich for recording sessions at Tottenham Court House
December 2006	Radiohead continue recording sessions with Godrich in Halswell House and Hospital Studios
January 2007	Radiohead continue recording at their Oxfordshire studio

June 2007	Radiohead complete recording sessions; Godrich posts excerpts on Radiohead's web site Dead Air Space
15 June 2007	EasySpace Ltd registers InRainbows.com
July 2007	Radiohead mixes *In Rainbows*
August 2007	Terra Firma Capital Partners purchase EMI for £3.2 billion; Terra Firma's CEO Gary Hand announces job cuts and US$200m cost savings per year
17 September 2007	London Stock Exchange's last public listing of EMI's share price
1 October 2007	Jonny Greenwood announces Radiohead's new album is called *In Rainbows*
10 October 2007	Radiohead releases *In Rainbows* online at 05:30 GMT as a digital download on InRainbows.com
31 October 2007	Network Solutions LLC registers Radioheadstore.com domain name
5 November 2007	EMI announces it will release Radiohead's 6 Parlaphone studio albums & 1 live album as MP3s (US$70), a 7 CD box set (US$80) and a limited edition 4G USB (US$160)
5 November 2007	comScore announces estimated download numbers and digital download sales for Radiohead's *In Rainbows*: 60% of fans did not pay for the album
5 November 2007	Union Square Ventures managing partner Fred Wilson: '. . . it's time to come up with new business models to serve the freeloader market'
December 2007	EMI registers Radioheadstore.com as 'ambush' marketing
3 December 2007	Radiohead releases 2CD limited edition of *In Rainbows* to online subscribers
10 December 2007	EMI releases a limited edition 4G USB drive of Radiohead's EMI albums
26 December 2007	BMG releases *In Rainbows* in Japan
29 December 2007	Remote Control Records releases *In Rainbows* in Australia
31 December 2007	XL Records releases *In Rainbows* in worldwide territories
31 December 2007	Radiohead performs 'Scotch Mist' live set and releases free digital download
1 January 2008	TBD Records and MapleMusic/Fontana releases *In Rainbows* in United States and Canada respectively
March 2008	Radiohead announces competition for a user-generated video clip
3 June 2008	EMI releases *The Best of Radiohead* on CD & DVD
24 June 2008	Radiohead releases *Live From The Basement* album (*In Rainbows* live) produced by Nigel Godrich on Apple's iTunes store
14 July 2008	Radiohead debuts 'House of Cards' video clip on Google 'using geometric informatics and velodyne lidar technology' [sic]

11 August 2008	Radiohead announces four winners of the Aniboom competition to create a user-generated film clip for an *In Rainbows* track
Late 2008	Radiohead tour the United States, Europe, South America and Japan before plans to record a new album

Public Sources: Facebook, Google Finance, Internic, Yahoo! Finance, *Rolling Stone*, Wikipedia

APPENDIX A5: NINE INCH NAILS (NIN) TIMELINE FOR *THE SLIP* (2008)

1992	Critics interpret NIN's *Broken* EP as Trent Reznor's criticism of his former label TVT Records; Reznor wins a Grammy
February 2003	Rumours circulate that NIN and Reznor's label Nothing Records are preparing to leave UMG and Interscope Records
2005	In bankruptcy proceedings by Prudential Securities, TVT Records auctions the rights to NIN's early recordings and Reznor's Leaving Hope/TVT Music
22 November 2005	Rykodisk releases CD version of NIN's *Pretty Hate Machine* (1989); Reznor refuses to develop a planned Deluxe Edition when Rykodisk refuses to pay him to undertake the archival project
27 May 2005	Reznor wins a US$3 million fraud lawsuit against former manager John Malm, Jr
20 December 2006	The Pirate Bay receives Disc 1 of NIN's unreleased DVD set *Closure* (Halo 12)
21 December 2006	Reznor writes on NIN's official blog: '12/21/06: Happy Holidays! This one is a guilt-free download. (Shhhh — I didn't say that out loud). If you know what I'm talking about, cool.' [sic]
23 December 2006	The Pirate Bay receives Disc 2 of NIN's unreleased DVD set *Closure* (Halo 12)
12 February 2007	Reznor launches an alternative reality game based on NIN's dystopian concept album *Year Zero* with allusions to his anger about the Bush Administration's response to the Hurricane Katrina disaster in New Orleans, which had been Reznor's home and recording studio
30 March 2007	The Recording Industry Association of America send 'cease & desist' letters to fans over USB files of NIN's *Year Zero*; Reznor then reveals the USB files were part of a sanctioned 'viral marketing' campaign
May 2007	Reznor attacks UMG in a blog post on NIN's web site about promotional plans for the album *Year Zero*
14 August 2007	Reznor registers NIN's official YouTube channel: http://www.youtube.com/ninofficial
September 2007	Reznor attacks UMG during an Australian tour over the inflated prices of NIN albums in HMV retail stores
17 September 2007	Intercosmos Media Corp registers Nullcorp.com domain name

8 October 2007	Reznor fulfils NIN's 'contractual obligations' to UMG's Interscope Records
1 November 2007	Saul Williams releases *The Inevitable Rise and Liberation of NiggyTardust* produced by Reznor
20 November 2007	UMG halts NIN remix site; Reznor engages in brinkmanship
27 November 2007	Reznor launches NIN remix site without UMG's approval
2008	Reznor founds The Null Corporation
16 February 2008	Reznor announces NIN's *Ghosts I–IV* album
2 March 2008	NIN releases *Ghosts I–IV* album online as a digital download
10 March 2008	In an ABC Radio interview with Triple J's 'Hack', Reznor criticises Radiohead's *In Rainbows* release as 'insincere' given their subsequent reliance on a traditional release strategy
April 2008	Reznor announces '2 weeks . . .' cryptic message on NIN site
Late April 2008	US radio stations play NIN's new single 'Discipline'
2 May 2008	NIN releases the song 'Echoplex'
5 May 2008	NIN releases *The Slip* as a digital download: 'This one's on me . . .' says Reznor to fans on NIN's web site
5 June 2008	Reznor releases *Lights in the Sky* North American tour sampler
22 July 2008	NIN releases *The Slip* as a CD/DVD package
8 August 2008	HBO announces NIN's *Year Zero* album (2007) might become a television series
3 September 2008	NIN relaunches NIN.com as a fan-oriented social network
13 September 2008	*Wired* News praises NIN's technological innovation in lasers, LEDs and stealth screens for its *Lights in the Sky* live tour

Public Sources: Internic, NIN.com, Wikipedia

APPENDIX A6: CASE STUDY TECHNICAL NOTES

A6.1 Game Theory

The 'buzz' around Radiohead's *In Rainbows* decision parallels Google's decision to use a Dutch auction for its initial public offering (19 August 2004) and the use of Vickrey auction theory, game theory and market mechanism design for telecommunications spectrum auctions in the United States (July 1994) and the United Kingdom (27 April 2000).

UMG's refusal to release the Nine Inch Nails' DVD *Closure* (Halo 12) may have been the decision that convinced Reznor to adopt a **Grim Trigger strategy**: the DVD files were mysteriously leaked to The Pirate Bay in December 2006. Reznor's battles with UMG to release album and DVD projects on his own terms are a series of **subgames** and **move/counter-move dynamics**. Appendix **A3** discusses several precursor cases including Prince's fallout with Warner Bros., George Michael's lawsuit against Sony Corporation, and Guns 'n' Roses' US$12 million unreleased album *Chinese Democracy*.

Historical practices in the music industry such as 'payola' demand for guaranteed airplay may trigger a **Tit for Tat strategy** between artists and music labels' marketing staff.

Radiohead and Nine Inch Nails' career arc are a series of **repeated games** — major label signing, interaction, frustration and criticism — with different **strategies of iterated dominance**. Radiohead appears to have pursued a **Maximin** strategy with EMI during contract negotiations which rapidly became a **finite game** when Radiohead left the label.

A6.2 Bayesian Probabilities

The three judgments discussed in **Section 1** and re-evaluated in **Section 4** are examples of **theory-driven deductive judgments** which are close to the initial event. This is common in blogs, social networks and other online media and platforms which have a short time horizon.

Disruptive Information Revelation suggests that new information may invalidate the initial premises. **Bayesian Probabilities** are one framework which bloggers could adopt when making inferences and judgments about events. Blog publishing systems offer the flexibility for bloggers to revise **Bayesian posterior probabilities** on the basis of collective industry knowledge, new information and repeat observations.

The crises and disruptive innovation changes cited in **Section 2** and appendices **A1–A3** for the digital music industry may have been **Bayesian prior probabilities** which influenced Radiohead and Nine Inch Nails' decisions.

A6.3 Information & Managerial Economics

Radiohead and Nine Inch Nails' relationship with their respective labels illustrate the **Principal-Agent problem**: the labels' interests are misaligned with the artists. Examples of the Principal-Agent problem in the digital music industry include label revenues from album sales versus artist revenues from touring and merchandising deals, and Reznor's surveillance of UMG's pricing points for Nine Inch Nails albums in overseas markets.

Radiohead's digital download strategy may have been a decision to test the **expected utility** and **price elasticity** of its core customers for new album formats. The *In Rainbows* release also parallels **experimental economics**: Radiohead set up a real-life experiment, gathered data, and received public feedback from comScore. Radiohead's *In Rainbows* prominently established the digital download strategy in the public's mind. Trent Reznor's modification of this strategy for *Ghosts I–IV* (2008) and his adoption of Freeconomics for NIN's *The Slip* (2008) illustrates a **Stackelberg dynamic** of leader-follower sequential moves, suggestive of Henry Mintzberg's 'emergent' strategy.

A6.4 Negotiation

A comparison of appendices **A3–A5** might suggest **negotiation games** which are common in the digital music industry.

Radiohead's negotiations with EMI illustrate the **Brinkmanship strategy** whilst Nine Inch Nails' Trent Reznor uses an **Escalation strategy** with UMG. Both artists use **information coalitions**, **signalling** and **randomised strategies** to deal with their respective labels and to overcome or bypass the possibility of **communication distortion**.

Artist-label negotiations may have **period-specific effects**: artist and label announcements, the impact of concurrent events and deals in the digital music industry, and the communication strategies that each strategic actor adopts. The immediacy of blogosphere coverage also means that **strategy-contextual** and **time-dependent** factors of bargaining are not factored into negotiation analysis.

A6.5 Quantitative Models

Matrix algebra could be used to code event triggers, dynamic interactions and outcomes. **Markov Chain Monte Carlo simulations** could be built for randomness and uncertainty.

A6.6 The Greeks in Corporate Finance, Investment & Risk Management

Radiohead & NIN's resurgent careers were comparable to *Alpha* returns for investment portfolios. Both artists were sensitive to *Beta* fluctuations in the digital music industry as a whole, and to *Delta* underlying pricing of EMI & UMG's public stock value. EMI & UMG's respective M&A's triggered variations in *Gamma* rates of change: this created a feedback loop where high-profile artist foresaw *Delta* changes and defected as a flight to safe havens; media coverage of these defections altered industry *Beta* which then affected investors' perceptions of EMI & UMG's potential for *Alpha* returns. Radiohead and NIN's digital download strategies were hedges against *Gamma* firm-specific risk and *Vega* volatility, pursued with awareness of *Vega* time decay due to 'label shopping' negotiations, the high probability of retaliation by their former labels, and the unknown *Delta* of the new strategy.

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