No conflict, No interest: On the economics of conflicts of interest faced by analysts

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Abstract

This paper outlines evolution of the policy response to conflicts of interest analysts face in offering investment advice to investors when the company they follow may also buy merchant banking services from their employer. Both in the US and the UK on a both statutory and common law basis the response has been one of disclose and let market participants price the implied conflict or simply rebut the advice given. Yadlin (2001) has pointed out some of the implications for the fertility of noise-traders of the contrasting UK and US common law regimes. In this paper I focus instead on the common reliance on disclosure as a remedy for securities fraud on both sides of the Atlantic. An efficient market can price conflicts which are present and by implication unravel any potential damage to shareholder wealth induced by analysts’ conflicts of interests in this view. I consider the impact the presence of “noise traders” in financial markets may have on the welfare implications of this sort of policy stance. The presence of noise traders casts doubt on the benign impact of conflicts of interest in financial markets

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“Wall Street is about allocating capital. Great companies can get money easily – bad ones have to pay more of it. Wall Street gets paid by controlling access to that capital, and charging fees to get it. …The dirty little secret is that people on Wall Street keep half of all the revenue they generate.” (Kessler (2003), 81)

Financial analysts often wear two hats, a marketing hat for drumming up trade and hence commissions as well as a research hat for giving “independent” investment advice to clients regarding how to best invest their money. If the analysts’ employer, a merchant bank, is affiliated in some way to the company being followed then such “conflicts of interest” between selling the stock and impartially reporting its prospects can become intense. Mehran and Stulz (2007) define a conflict of interest to be “a situation in which a party to a transaction can potentially gain by taking actions that adversely affect the counterparty”. Such conflicts of interest between the duty of an analyst to his employer and client have become the focus major litigation in both the US and the UK. But as the above quote from Anson Beard, a senior banker at Morgan Stanley in the late 1998’s, makes clear it is almost a universal characteristic of the worldwide investment banking industry. A recent Special issue of the Journal of Financial Economics confirms the renewed academic interest in this important area of professional practice (Mehran and Stulz (2007)).

The most infamous illustration of this conflict was the 2004 Global Analyst Settlement by 10 US investment banks who gave poor advice about the prospects of dot.com companies. These investment banks agreed to pay $1.4 billion in settlement of threatened litigation arising from their clients’ losses. This included particular penalties for two star analysts of the .com (and especially broadband) boom, Jack Grubman and Henry Blodget. As part of the settlement the banks paid out $845 million in disgorged profits, $432.5 million to fund investment research and, finally, $80 million to fund education in investors. The perceived failings of Analysts were addressed by Title 5, Section 501, of the Sarbanes-Oxley Act. This attempts to outlaw conflicts of interest for analysts and enforces a declaration of independence from the firms they cover upon them. In 2002 the UK Financial Services authority (FSA) issued guidelines about how to handle such conflicts of interest and a recently completed study by the FSA has evaluated the efficacy of these guidelines.

Much of the response of regulatory agencies and the Courts to the manifestation of these conflicts appears grounded in a belief in a somewhat standard version of the efficient markets hypothesis. This produces a “forewarned in forearmed” response relying largely on disclosure of the presence of conflicts to the investing public to ameliorate problems which arise. The presence of noise traders, sentiment based trade and overreaction to short-term trends suggests existing policy may have an inadequate/unrealistic foundation.

Discussion of the conflicts of interests which analysts face has really focussed upon two issues which we outline below,
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Are such conflicts actually a problem for the clients of investment banks at all? This reasoning challenges the prohibition or legal penalisation of such conflicts,

If these conflicts are a problem for investors how are they best prohibited or monitored?

This paper attempts to formally model how the presence of “nose-traders” in the market can affect our conclusions regarding these questions. In Section 1 I discuss some general issues regarding analyst’s conflicts of interest. Section 2 outlines the current legal position in the United Kingdom, European Union and United States jurisdiction. In Section 3 I introduce a theoretical model to capture the themes examined in the paper. Section 4 undertakes numerical simulation of the impact of analysts’ conflicts of interests in that model. Section 5 concludes the paper and draws policy conclusions.

I. Analysts’ Conflicts of Interests and their impact

I. Evidence of conflicts of interest from empirical studies

Even prior to the excesses of the .com boom a number of studies were undertaken of analysts’ conflicts of interest. These include Lin and McNichols (1998), Dugar and Nathan (1995) and Michealy and Womack (1999). A related study by Paul Gompers and Josh Lerner and which examines the market-performance of initial public offerings (IPO’S) brought to market in years 1970-1992, by venture US capital firms which are subsidiary of investment banks (Gompers and Lerner (1999)). In such circumstances the investment bank underwriter has a clear incentive to overprice the IPO since it stands to receive a large part of the deal’s proceeds. But these authors find the market recognises this conflict and discount the price of venture capital offerings by affiliated investment banks accordingly. These early studies formed the backdrop that informed the inception of the Sarbanes-Oxley Title 5 legislation. Their results suggested that analysts exhibited an additional “reporting” bias, due to their need to mollify their employers’ investment banking clients which is separable from and incremental to the many previously documented “cognitive” biases they exhibit (optimism, overreaction, herding, etc, see (Francis and Philbrick (1993)).

A study by Barber et al (2007) in a study of over 300,000 recommendations issued by 409 securities firms concerning the fortunes of over 11,000 separate companies in the years 1996-2003 conclude that it is during market downturns that the most damage is done to the informational role of prices by analysts’ conflict of interest. Specifically they report that after the stock market downturn in early 2000 a large gap appeared between the investment value of offerings by recommendations issued by independent as against conflicted financial institutions. Specifically, after the downturn a 3.1 basis point daily abnormal return appeared to open up from following independent research from institutions without an investment banking arm as against recommendations issued by compromised investment banks. For companies issuing equity during the test period covered the mark-up to
following independent advice was even bigger. Oddly, prior to the downturn there was a small insignificant benefit to following the conflicted analysts’ advice (viz, “just keep buying”). This implies the extent of damage done by analysts’ conflict of interest depends on the sentiment of the market at the point in time of the test. In market booms conflicts of interest may work to investors advantage because biased forecasts provide a more efficient signal regarding company value.

A more recent study of the impact of analysts conflict of interest suggests that while such conflicts manifestly exist their impact on traded prices may not be particularly great (Agrawal and Chen (2006)). Conflicted analysts are indeed more optimistic in their recommendations, and were especially so in the 1990’s boom era, but investors recognise this and discount the value of their recommendations accordingly. The one-year-ahead forecast performance of conflicted and truly independent analysts showed little statistical difference on average. This suggests there may be little potential public harm to investors for public policy to be concerned with. But the law is not typically concerned with the “average”, or “representative”, agent but with individual plaintiffs and their perceived, or actual, losses. So the results of market-based studies do not resolve the question of the need for regulatory intervention to protect investors.

II. Analysts’ role in the .com era

At the end of the .com/.con (Cassidy (2002)) boom the search for sacrificial lambs began and it was not long before the names of leading technology analysts, Henry Blodget, Jack Grubman, Frank Quatrone and Mary Meeker started to come up as the usual suspects for inciting a bubble psychology to the market. These analysts were seen to typify and new style of investment advisor who assumed the role of advisor to the firm’s whose fortunes they predicted for clients in order to achieve greater insight into their corporate lives and possible futures.

As the internet boom continued analysts straddled, and even crossed, the “Chinese Walls” separating investment banking (preparing companies for floatation and giving advice on mergers and acquisitions) from providing investment advice to buy, sell, or hold particular shares. These walls were erected to prevent analyst’s advice being compromised by a perceived need to support their colleagues in investment banking. So a company stumbling after an initial public offering underwritten by the analyst’s employer would be condemned to a sell recommendation by the banks’ analysts offering objective advice to their clients. Analysts had historically been expected to “Call them like they see them” regardless of what their employer had done for the company in the past, or hoped to do in the future.

Increasingly analysts felt the pressure to cross such Chinese Walls to support their investment banking colleagues who accounted for the lion’s share of their common employer’s revenue. On being
asked about the objectivity of his research in 1997, given his position on the Board of Directors of Worldcom, Global Crossing and other companies he recommended for purchase, Jack Grubman of Solomon Smith Barney stated

“What used to be called conflict is now synergy. Objective research? The other word for it is uninformed research.” Gasparino (2005) pp 146.

While some chaffed at Grubman’s candour this quote most probably a stark expression of the underlying reality analysts faced at that time. Indeed the Wall Street Journal praised Grubman in 1997 for how deftly he negotiated the conflicts of interest between being a good stock-picker and helping drive corporate banking revenue for his employer in an article entitled “The Jack of all Trades: For Salomon, Grubman is a big Telecom Rainmaker”. Stating that what separated

“Grubman from the pack is how skilfully he manages to walk the divide between banking and research with his credibility in tact” Gasparino (2005), pp 87

With such praise it is easy to see why few analysts saw the problem in their conflicted position. The U.S Congressional hearings in 2001 may have displayed a certain amount of selective memory in damning analysts for their conflicted investment advice to clients. Mary Meeker the “Internet Queen” of Morgan Stanley has asked “Whatever happened to personal responsibility?” Meeker, had started out as the protégé of Frank Quatrone at Morgan Stanley. Quatrone was nothing if not enthusiastic (and possibly delusional) in his support for Morgan Stanley’s Internet based investment banking clients.

Meeker’s grave doubts about the stocks she was asked to take public by her employer led her to veto many proposed floatation deals touted by Morgan Stanley’s investment banking arm. Conveniently for later struggles Meeker kept a tally of the 50% of deals she rejected after 1995. As early as 1991 Meeker in advancing her “Ten Commandments of investing in Tech stocks” in a circular to clients advised on adopting a contrarian strategy. In particular she advised

“Buy stocks when no one is interested in them as investments….But sell them when everyone is interested in technology.” Gasparino (2005) pp 53

Specifically Meeker advised clients to

“not fall in love with technology companies” and “Remember to treat them as investments.” Gasparino (2005) pp 53

If this advice had been followed many of the Congressional Committee’s concerns would have been addressed. Even as late as early 2000, but before the crash, Meeker in the Wall Street Journal warned investors “You never want to catch a falling knife.” (Gasparino (2005), pp 129).
But in the post-boom depression as President Bush lambasted the “Dark side of Capitalism”, such truths were conveniently forgotten. At some distance from those events perhaps a more considered appraisal of the market impact of analyst’s conflicts of interest is now possible.

III. No conflict, no interest

John Doerr of Kleiner Peabody commented on his involvement in both the start-up financing and management of various new-economy firms, Netscape, Google, etc, that where there was no conflict of interest he had no interest in investing (Clark and Edwards (2000), p 8). The motivation to earn money as an individual can drive an analyst or investment bank to pick winners. In short the opportunity for personal profit, via an underwriting commission related bonus, can motivate more accurate and profitable coverage of a stock.

James Spindler (Spindler (2006)) has argued for the de-criminalisation, if not encouragement, of conflicts of interest in investment research. He has advanced three primary arguments to support this case.

✓ Independent research is research based on public sources with little more value than an article in the Economist or Investors Chronicle. Conflicted research is value-added research benefiting from in depth, behind the scenes and legally required public filings (recall the Grubman quote above).

✓ Company management bear a duty of strict liability for claims and representations in an initial public offering, or acquisition, prospectus. For example, if a claim is made to a piece of intellectual property and this is subsequently successfully legally challenged management are legally liable for its investors’ subsequent losses at common law. The fact that this was a reasonable claim and one the management truly believed cannot protect them in Court. This leads to hedging, legalese and banal claims in prospectus documents. Often the only way to convey the good prospects of the firm without incurring strict liability is perhaps via a buoyant investment analyst’s report, or forthright claim in the pre-deal “road show” to prospective investors.

✓ Underwriters seem to display little inclination to compete on price with 7% of the IPO proceeds being a fairly well-established “going rate” for the job of taking firms public (Chen and Ritter (2000)). Price competition has little to offer merchant banks as a way of selling their services. Competition in “pitching” for a spot as an investment advisor to a major corporation is largely based upon the quality of the representation to potential investors on offer. So conflicts of interest, while potentially damaging to investors as analysts’ clients can
serve to raise the quality of investment banking representation, even if the cost remains fixed at 7%.

This is a fairly compelling set of arguments if disclosure is sufficient protection for investors. Much existing public policy suggests that this is the prevailing political orthodoxy. But this orthodoxy is now being questioned. This paper provides a simple model for the discussion of these policy issues

IV. Is disclosure of a conflict of interest sufficient protection for investors?

The light touch regulatory response to many conflicts of interest in professional life is to ensure disclosure and allow the market to work its magic. Recent studies of the investment value of stock recommendations imply that this may indeed work in the average case. Conflicting objectives may lead some analysts to make exaggerated claims on behalf of the companies they follow. But the market recognises both the presence and the approximate scale of this “reporting” bias and adjusts prices accordingly.

Larry Brown and colleagues report on the efficacy of one such attempt at self-regulation in Brown, Hugson and Lui (2006). Brown et al (2006) study a program of public disclosure of past misdemeanours by analysts organised by the National Association of Security Dealers (NASD), including criminal actions, civil suits, dismissals for misconduct and SEC investigations into their conduct. They find such infringements of the Association’s rules are not that rare with 11% of their sample companies attracting forecasts from analysts who have disclosures in the NASD database. The forecasts of disclosed analysts that are less accurate and recognised to be so by the market than a control group of analysts with similar characteristics but no NASD disclosures. The impression given by the study is that disclosure can indeed ameliorate the corrosive impact of professional misconduct on the market value of investment advice. Again these conclusions hold for the average firm. The implication being self-regulation can at least partially mitigate any losses investor’s accrue due to exposure to the “reporting” bias exhibited by conflicted analysts.

Experimental evidence concerning the impact of conflicts of interest on forecasting performance has been provided by Daylian Cain and colleagues at Carnegie Mellon (Cain, Lowenstein and Moore (2005)). Cain et al (2005) enrolled 147 Carnegie Mellon students to undertake a task of determining the value of jar full of pennies. The students were randomly assigned to one of two groups, a team of advisors or a team of estimators. Advisors were allowed to examine the jar of pennies and were given a range of values within which the true value of the coins contained within lay. Advisors issued a report on the value of the jar’s contents to estimators. The advisors issued a
report to estimators concerning their opinion about the jar’s value. The estimator was also shown the jar briefly for 10 seconds at a distance of three feet away. Based on their own guess and the advice received from their advisor estimators were asked to state the value of the contents of the jar full of pennies. Their reward was based on how accurate their statement of value was. Some advisors were told they would be rewarded for giving advice that led to accurate valuations by estimators (call them the “accurate” advisors). Another group of advisors were told they would be rewarded for making the estimators valuations as high as possible (call them “high” advisors).

Advice was given and estimates supplied six times during each experimental session. During the first three evaluations estimators had no idea that “high advisors” might be present, or what was the motivation behind the advice they were being presented with. But in the last three sessions those receiving advice from “high advisors” were warned that their advisor had an incentive to make his evaluation as high as possible.

The results of the experiment showed that advisors rewarded for going high did so and were able to raise estimators’ valuations by doing so. Estimators receiving advice from “high” advisors did not raise their valuations by as much as the biased advice they received implied but they did raise it significantly. The impact of disclosure of the high/accurate status of the advisor in the last three rounds was simply to exacerbate these trends. “High” advisors raised their valuations even further and this fed through to induce even greater overvaluations by estimators.

Cain et al (2005) explain their results in three ways.

✓ Firstly, it is possible that disclosure makes the advisors feel it is morally acceptable to give poor advise. They may think “well they do know!”. This can induce even poorer standards regarding the quality of advice provided to assessors.

✓ Secondly the “availability” heuristic suggests that the estimators guesses might become anchored on the “high” advisors estimate of value, even though they realised its value is compromised.

✓ Finally, backward induction of the “they know I know” type may deceive the estimator into failing to fully control for the bias the “high” advisors impart to their suggested valuations.

These factors combine to cast doubt on the efficacy of disclosure as a cure all solution to the presence of conflicts interests amongst analysts from an investor’s viewpoint. The addition of noise-traders who do not trade on fundamental value raises further reasons for support having doubt regarding the efficacy of disclosure as a complete source of amelioration to the economic damage imposed by conflicts of interest.
II. **The Law on analysts’ conflicts of interest**

I. UK policy on conflicts of interest

UK policy on conflicts of interest has largely evolved via successive intervention by the Financial Services Authority (FSA) and UK policy responses to the European Union’s Market Abuse Directive of 2004. A particular concern emphasised in the FSA’s Discussion Paper 171 of February 2003 (FSA (2003)) was the growth of the two worrying investment practices

- “laddering”, or the attempt to access part of the profits from a floatation by channelling shares to favourite clients and employees,
- “spinning”, using IPO allocations to give incentives to other companies, or individuals, to reciprocate with subsequent investment banking contracts or reciprocal allocation arrangements.

In order to address these abuses the FSA’s consultation Paper (FSA (2003)) makes recommendations in a wide-range of areas; these include

- The supervision and management of analysts,
- Analysts’ involvement in investment banking and equity sales,
- Analysts compensation and reward structures,
- Exposure by analysts to pressure by their employer’s investment banking clients.

The emphasis here is on the Code of Business and guidance rather than formal sanctions. As such these guidelines can be seen to form part of “meta regulation” of financial services providers by the FSA that uses the company’s own internal governance procedures to detect and remedy threats to the FSA’s statutory objectives. Gray and Hamilton (2006) describe this trend as follows

“Rather than directly imposing detailed procedural requirements on firms as to the design of their internal risk management the framework seeks to leverage off firms’ own systems and expertise in aid of reducing the risk to the FSA’s objectives” Gray and Hamilton (2006), pp 39.

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These conflicts of interest and other bad practices were addressed in an FSA’s Consultation Paper of February 2003 (FSA (2003)). This document formed tentative policy views partially based on written responses to an earlier Discussion paper of mid-2002 (FSA (2002)). The discussion paper on conflicts of interest in investment advice generated three primary responses from market participants:

- a preference for the current UK “principles” based regime, as opposed to the more heavy handed legalistic approach preferred by the Security Exchange Commission in the US,
- a perceived need for greater clarity on what the boundaries are between the marketing of shares and giving impartial investment advice,
- a desire for the UK, US and EU regulatory regimes to be consistent, while recognising regional differences.

The FSA accepted this preference for broad principles, where most intervention is in the form of guidance and a published “Code of Business”, rather than new laws and statutory instruments, etc. The outcome of the consultation process is reported upon in Consultation paper 171 FSA (2003) and are outlined in Consultation Paper 205 of the FSA on “Conflicts of Interest: Investment research and the issue of securities” FSA (2003). This consultation makes a number of changes to FSA policy in relation to conflicts of interest.

- Foremost amongst these is the move to require the writing and publication of a “management of conflict” policy by institutions offering investment research. This constitutes part of a general trend of FSA policy implementation away from rules-based regulation towards the provision of models for effective internal governance (Gray and Hamilton (2006)).
- The requirement to publish a management of conflict policy relates only to those who claim to produce “independent” research, as opposed to marketing stocks, or summarising/commenting upon the analysis of others. The scope of the policy includes non-equity investments, corporate bonds and hedge funds if their advice is likely to be published to clients outside the firm.
- Initial proposals to introduce U.S style “quiet” periods around IPO’s were abandoned since they seemed to offer little in the way of abating the underlying conflicts of interest between advisors and their clients.
Of particular relevance to James Spindler’s arguments in favour of encouraging, or at least not penalising, conflicts of interests is the FSA’s reluctance to allow conflicted analysts to issue documents or recommendations which supplement or enhance information given in the IPO prospectus. Overall the FSA’s response contains a strong theme of “buyers beware” advice. As Gray and Hamilton (2006) state the case

“the FSA is attempting to recast citizens as pro-active risk-aware consumers of financial services products, who seek the opportunity to secure their financial future through participation in financial markets and who accept responsibility for the results of the choices made”. Gray and Hamilton (2006), p. 47.

In this latter part of this paper I ask what happens if one type of risk consumers face is “noise-trader” risk. How does this type of risk impact upon the costs and benefits of accepting investment advice from conflicted analysts.

II. US policy on conflicts of interest

In the United States legislative policy on the conflicts of interest faced by analysts is now enshrined in Title V of the Sarbanes Oxley Act entitled “Treatment Of Securities Analysts By Registered Securities Associations”. The Security and Exchange Commission issued Regulation Analyst Certification ("Regulation AC"). Regulation AC in February 2003 requires that brokers and dealers certify that the views expressed in their report accurately reflects his or her true personal views. Further, these agents must disclose whether or not the analyst received compensation, or other payments, in connection with his recommendations. Once again this is a disclosure based solution to the conflict of interest problem which behavioural research leads us to doubt. Any solution to these problems may be rendered far more difficult in the presence of “noisy” prices whose variance is not entirely driven by news about the economic fundamentals determining future cash-flows to holding assets. Broker-dealers are required to obtain periodic certifications for research analysts they employ in connection with their public appearances to support clients on “road-shows” etc. Regulation AC became effective in the United States as of April 2003. But the impact of this legislation now extends out to overseas subsidiaries of US institutions and those servicing them via the Sarbox compliance regime.

III. The Common law of conflicts of interest

While it is uniformly the case that representations made at the date of initial public offering are held to standards of strict liability Yadlin (2001) points to a divergence between US and UK Common law practice regarding the punishment of unreliable statements made with respect to issues into the secondary market. Yadlin (2001) distinguishes three conceivable common law regimes
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- The traditional common law model, which requires plaintiffs show the issuance of representation by the firm to that particular investor, that they did rely on the representation identified once it was made and that doing so caused the loss for which they claim damages. So successful claimants are required to show all three elements of the claim, proximity, reliance and causation before their claim can succeed at common law. This is the current position in the UK courts in relation to representations regarding securities traded in secondary markets,
- A intermediate reliance regime in which the claimant is not required to show any personal relationship with the company which made the representation or even knowledge on the part of company officials that he had in fact relied on their representation in trading,
- Finally, the current US Common law position, based on the “fraud on the market” doctrine that simply requires that the claimant show he held the security whose value fell due to a false representation being unmasked even if he never knew of its prior contribution to the value of the security he held.

Yadlin (2001) points out the US common law position greatly favour the position of noise-liquidity traders as opposed to active investors who take an active role in monitoring the company’s management. The US fraud on the market doctrine facilitates free-riding of active investors efforts to restrain managerial abuses of power. Here I focus on the role of liquidity traders also, but I do so to expose a common weakness of the legal regime on both sides of the Atlantic. This is the reliance of both the common law and regulatory response to analysts’ conflict of interest on disclosure as a suitable, and possibly sufficient remedy.

IV. The Dura Pharmaceuticals case

But it is the judicial response to analysts’ conflict of interest that is by far the most controversial aspect of U.S public policy on this issue. As in the case of Spindler’s advocacy of the benign nature of conflicts of interest many of these decisions reflect a strong degree of confidence in traditional notions of an “efficient market”. A particularly contentious example of this is the recent Broudo v. Dura Pharmceuticals decision of the Supreme Court (339 F.3rd 993 936-7 (9th Circuit 2003). The Dura case changes the basis for the award of damages in conflict of interest claims. While a stock price change has always been required to prove reliance of investors on the company’s claims in conflict of interest cases, until Dura stock price movements had not been the focus in awarding damages.

Broudo and a group of investors purchased equity in Dura Pharmaceutical (Dura) after a series of claims by Dura regarding its new respiratory delivery/inhaler device. Dura later revealed that the Federal Drug Administration (or FDA) would not approve the device because of concern about its
safety/reliability. Upon release of the FDA decision, Broudo alleged Dura and its officials had made misleading statements about the inhaler’s fitness for purpose and invoked a Securities Acts 1934 Section 10 (b) - 5 “fraud on the market” claim. This interpretation of legislative intent was established within the U.S Supreme Court in the prior case of Basic Inc v Levinson. Under this doctrine an investor does not have to show they personally acted upon the damaging representation of the firm. He must merely show that the market as a whole was influenced by it and hence it was reasonable for the plaintiff to do so. Since the market accurately prices the stock to reflect value it is reasonable to buy at the market price. This is the statutory version of the common-law doctrine that a market test can be used to establish reliance on the company representation.

Specifically, Broudo alleged that Dura had falsely exaggerated the progress the respiratory device had made towards being a licensed product for sufferers use. The loss causation element of a plaintiffs’ case, as opposed to the reliance part, requires the plaintiff to prove a causal connection between the alleged fraud and a subsequent decline in stock price. Since Broudo failed to establish a connection, the district court dismissed the plea.

The 9th Circuit Court of Appeals held the loss causation element of damages does not require proof of a causal connection between the alleged fraud and the fall in the share price. According to the court, “plaintiffs establish loss causation if they have shown that the price on the date of the purchase was inflated because of the misrepresentation.” The Court determined Broudo had presented enough support for his allegation that Dura’s stock price was inflated due to fraud to survive a motion to dismiss. Broudo may not have of been aware of the specific reasons for Dura’s price being inflated. But at common law all he needed to show was that he accepted the prevailing price as a fair indication of Dura’s true value. Any gap between what he paid and what Dura was subsequently shown to be worth was a financial loss for which Dura was potentially liable in Court of Appeal’s view.

The Dura decision can be seen as a leading to some dysfunctional, and perhaps unexpected, consequences. James Spindler (Spindler (2006)) points out that one possible effect of Dura is to give company management an incentive to bundle announcements to disguise there stock market impact. Or shift the timing of announcements to a day when the company’s stock price is especially “noisy”, so true fundamental value is hard to discern. By doing so the company may hope to disrupt the alleged causal chain upon which the plaintiff seeks to rely. Even more worryingly Spindler (2006) argues the Dura decision may give incentives for company management to lie big if they need to lie at all. The ex-post damages award rule is based on the scale of the share price decline, after the truth is revealed, rather than the scale of the deception initially perpetrated. This means if you are going to lie about your business prospects you may as well make it a whopper. The stock market’s frequent overreaction
to relatively trivial disclosures might encourage such perverse suppression of truthful representation by company managers.

The very extension of the “fraud on the market” doctrine from use in proving reliance on a representation to the estimation of damages arising from that misrepresentation is fraught with danger. In pointing out the danger in this transition Bradford Cornell and James Rutten (Cornell and Rutten (2006)) remind us that the basis of the “reliance on the market” theory in the Court’s judgement is

“The fraud on the market theory is based on the hypothesis that, in open and developed securities market, the price of a company’s stock is determined by the available material information regarding the company and its business.... Misleading statements will therefore defraud purchasers even if they do not directly rely on the misstatements.”

In dissenting comments Justice White in the Basic Inc case warned of the dangers of any extension of the “fraud on the market” principle to assessing damages. For while rough and ready market efficiency implies company representations will influence price, the assessment of damages requires that not only that the stock market’s respond to new information but also that the magnitude of its response reflects information disclosed about underlying asset value in that information. Numerous well documented stock market biases, overreaction, under-reaction and investor herding suggest this may not be a sound basis for public policy.

V. Market efficiency, conflicts of interests and the courts

As seen above both judicial and legislative responses to the problem of analysts’ conflicts of interest place considerable reliance on the efficiency of financial markets. This is done both in the assessment of damages in the US courts and the assumed sufficiency of disclosure as a cure to damage caused by analysts’ conflict of interest by the UK regulatory authority the FSA. This has underpinned the FSA’s response to conflicts of interest by means of guidance regarding best practice forms of internal governance and compliance procedures with investment banking firms.

In the latter part of the paper I consider the impact of introducing noise into analysts’ valuations of stocks to determine the impact of such a potential market inefficiency upon the market ideal the courts and regulators may have in mind. To do this we I adopt a simple model already present in the Finance literature. The structure of the model allows for the easy capture and measurement of the impact of noise in the relationship between analysts’ forecasts/recommendations and consequent share price movements. Other recent theoretical models like Bolton, Xavier and Shapiro (2007) have emphasised the impact of the presence of conflicts on price-setting in financial

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markets, for example, but here I emphasise how the impact of these effects might be filtered through the impact of noisy prices. Having done this I conclude the paper by drawing some implications of the presence for noise-traders in the market for regulatory policy with respect to analysts’ conflict of interest.

3 Modelling analysts’ conflicts

I. The Ivkovic and Jagadeesh model

Ivkovic and Jagadeesh (2004) (henceforth IJ) model the stock market impact of stock market analysts’ forecasts and recommendations in order to determine the nature of their informational advantage be that as “advisors” or “recommenders”. IJ envisage the potential value of analysts’ search for value as coming from two potential sources

✓ They may be better at predicting public information. This would be the case if they made clever use of time-series models of earnings prediction or the implication of disclosures about goodwill write-offs and research and development for future value,

✓ They may be better at extracting private information about the company. This would be the case if analysts by judging the quality of the management, or technology development, could be predict company performance and hence value.

IJ incorporate these two potential sources of analyst’s informational advantage into a simple theoretical framework and develop a metric which allows some measurement of the dominance of these competing sources of value. They explore this by examining the precise point in the earnings announcement cycle at which analysts’ forecasts and recommendations are of most influence upon market prices.

IJ envisage price as being decomposed into two elements, an element on which investors/analysts have perfect-foresight and a more unpredictable element of value. So price evolves as follows

\[ P_t = P_t^* + \eta_t \]

where \( P_t^* \) is the “perfect forecast” price which would prevail if the complete trajectory of future earnings were known and \( \eta_t \) reflects a pricing error arising from uncertainty regarding future cash-flow.

IJ decompose the pricing-error, \( \eta_t \) itself into two elements

✓ An element reflecting true uncertainty about earnings (the sole value-metric in the IJ model), \( \varepsilon_t \)

✓ An element reflecting non-earnings information, \( \nu_t \). This is interpreted as cash-flow by IJ, but may perhaps also be seen as “noise” (a possibility I explore later) introduced by those who
trade on information other than earnings, e.g. “intangible” aspects of value or market sentiment.

Hence

\[ \eta_t = \varepsilon_t + \nu_t \]

\[ \varepsilon_t \sim N(0, \sigma^2_{\varepsilon}(t)) \]

Where the part of pricing error with respect to fundamental value, here future earnings, declines over time as we approach the earnings announcement date. So the stock price is predicted to converge on the true price consistent with full-knowledge of earnings, \( P^* \), by the date earnings are announced apart from a divergence produced by the disturbance \( \nu_t \), i.e. uncertainty about non-earnings related aspects of value.

Analysts are given a role in pricing shares in the IJ model by issuing revisions of their forecasts of future earnings, these revisions contain a signal concerning price, \( \theta \). This signal about price which analysts convey also contains two elements

✓ Information about changes in earnings, \( \varepsilon_t \)

✓ A “noisy” element which may reflect bias, compromise or simply ineptitude on the analysts’ part, \( \phi \). Whatever their motive the size of \( \phi \) is not affected by the size of \( \varepsilon \) at any point in time.

So

\[ \theta_t = \varepsilon_t + \phi_t \]

IJ further assume

\[ \phi_t \sim N(0, \sigma^2_{\phi}) \]

This appears to rule out the possibility of noise-traders “creating their own space” at least by means of conjectures about earnings. The distribution of \( \nu_t \) in the pricing equation is left unspecified, allowing a role for non-earnings based valuation errors to generate noisy elements of value. Introducing noise traders then implies that the mean of \( \phi \) could be non-zero (and in all likelihood positive). By gradually raising the mean level of \( \phi \) a role for non-information based trade, or “noise”, is introduced in later sections of this paper.

Given the signal received concerning value obtained by investors at time \( t \), \( \theta_t \), investors infer value and so price. This results in a price movement contingent on the information signal \( \theta_t \), which reflects expectations of future value.
\[ (1.1) \Delta P_t = (P_{t}^{\text{new}} | \theta_t) - P_t = \theta_t \left[ \frac{1}{\left(1 + \frac{\sigma_{e}^2(t)}{\sigma_{\varphi}^2(t)}\right)} \right] \]

where the ratio of signal variances \( \frac{\sigma_{e}^2(t)}{\sigma_{\varphi}^2(t)} \) is called the analyst information ratio (or AIR) by IJ. Much of the subsequent analysis of noise is portrayed in terms of the impact of “noise” on the informational value of the signal concerning value in analysts’ forecasts/recommendations as measured by the AIR. Note price change is decreasing in the analyst information ratio because \( \sigma_{e}^2 \) is in the denominator of the round bracketed inverse term so the overall term for price change in square brackets fall as \( \sigma_{e}^2 \) rises. As such the AIR is the Bayesian precision of the revision, with respect to earnings information, \( \frac{1}{\sigma_{e}^2} \), multiplied by the amount of “noise” in valuation from non-earnings sources. Let \( \frac{1}{\sigma_{e}^2} \) as the Bayesian “precision” of the signal about value implied from the analysts’ forecast revision. Now the role of \( \sigma_{\varphi}^2 \) is simply to mask the valuation signal conveyed by analysts forecasts/recommendations. Increases in \( \sigma_{\varphi}^2 \) simply increase the size of the inverse term in rounded brackets and so reduce the size of the overall square-bracketed term for the implied price change. Reductions in the AIR diminish the power of analysts’ forecast revisions to induce movements in price. To see this consider the case of a perfectly informative “pure” signal about earnings where \( \sigma_{\varphi}^2 = 0 \); that is all “noise” has been purged from the signal regarding value analysts’ forecasts convey. For this case

\[ \Delta P_t = (P_{t}^{\text{new}} | \theta_t) - P_t = \theta_t \left[ \frac{1}{\left(1 + \frac{1}{\sigma_{\varphi}^2(t)}\right)} \right] \]

In this case increases in the variance of the signal concerning earnings simply serve to amplify the response of prices to analyst’s revisions. Now price change conditional on the valuation signal, \( \theta_e \), becomes simply the inverse of Bayesian precision of that signal multiplied by the signal’s value itself, \( \theta_e \). A rising AIR \( \frac{\sigma_{e}^2(t)}{\sigma_{\varphi}^2(t)} \) heightens price responses to the signal contained in the forecast or recommendation as its informational content regarding value intensifies. So in this simple “pure” signal case very precise signals intensify the signal’s impact. This is because \( \frac{1}{\sigma_{e}^2} \) grows large and so the
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square bracketed term in the expression contracts. Very diffuse signals, for which $\frac{1}{\sigma^2_\epsilon}$ is small, the impact of the signal on price is greatly muted, or “noisy”, in terms of price response it induces. For example, consider when $\sigma^2_\epsilon = \sigma^2_\phi$ then the noisy price signal is halved compared to when there is no noise at all. Re-introducing $\sigma^2_\phi$ now simply serves to dull the impact of analysts’ forecast revisions since they can no longer be seen as unambiguous signals regarding fundamental/true share value which is solely determined by news about earnings.

Examining the temporal distribution of analysts’ ability to move security prices IJ find it to be greatest just before quarterly earnings announcement and least just after them. This may be because the precision of the analysts’ forecasts about true/fundamental share value is most intense (the AIR is highest) just before earnings are announced. This implies analysts’ contact with management to gain insight into, and even hints concerning, future earnings are vital to their ability to satisfy their clientele with valuable advice regarding asset value.

II. A simple numerical example of the IJ model in action

To illustrate the practical workings of the IJ model I consider the case of a share subject to two different types of shocks to value in each period. These are shocks in value from earnings, $\epsilon$, and some other “noisy” information about the share-price value not based on earnings, $\phi$. Following IJ I assume both types of news follow a normal distribution. In our example the variance of $\epsilon$, $\sigma^2_\epsilon$ held constant at 0.125. I consider the effect of increasing the dispersion of the non-earnings news component, $\sigma^2_\phi$ of 0.01, starting from a value 0.102. In the example I initially assume mean values of both $\epsilon$ and $\phi$ of 0.05. this implies $\Theta=1=0.5+0.5$. So substituting into the equation

$$
\Delta P_t = (P_t^{\text{new}} | \theta_t) - P_t = \theta_t \left[ \frac{1}{\frac{1}{\sigma^2_\epsilon(t)}} \right] = 0.1 \left[ \frac{1}{\frac{1+0.01}{0.125}} \right]
$$

$$
= 1 \left[ \frac{1}{8.816} \right] = 1.0113 = 0.113
$$

Now for the same illustrative values the AIR is $\frac{\sigma^2_\epsilon}{\sigma^2_\phi}=0.125/0.102=1.22$. Plotting each value successively, incrementing $\sigma^2_\phi$ by 0.01 each time yields Figure 1 below. Increasing the analyst information ratio (i.e. the informativeness of revisions about prices) raises the price response to analyst’s forecast revisions (and recommendations). Or alternatively the impact of earnings irrelevant
“noise” in forecasts, or recommendations, (the numerator of the AIR metric) is to dull the market’s response to analyst’s advice since the information about earnings being conveyed is masked by non-value relevant earnings information packaged in the same forecast or recommendation signal.

The AIR ratio is simply the inverse of the round bracketed term (plus 1 in the numerator of the AIR) in the calculation of share price changes in equation (1.1) above. So for the first increment induces a decrement in the AIR of 1.122 to 1.106 (as the variance of φ rises from 0.102 to 0.112) and produces a matching fall in return. The same increment in the variance of φ pushes down the share-price return from 0.1127, as show above to 0.111 (or 0.1x(1/8.96) following the same calculative method as above). The IJ model specifies that both ε and φ are drawings from a normal distribution with mean zero, so these simple proportional relationships are likely to be obscured by random components in both processes. But beneath these stochastic elements the underlying tendency of “noisy” forecasts/signals having a diminished market impact is likely to remain. For the simple case of perfectly informative signal, where \( \sigma_\phi^2 = 0 \) there is a one-to-one mapping of increases in \( \sigma_\varepsilon^2 \) and resulting price changes. To see this consider increases in \( \sigma_\varepsilon^2 \) for the perfectly informative case. In this case we obtain the expression
\[
\Delta P_t = \theta_t \left[ \frac{1}{\sigma_e^2} \right] \\
so \theta = 1, \sigma_e^2 = 0.25
\]

\[
\Rightarrow \Delta P_t = \left[ \frac{1}{\left( \frac{1}{0.25} \right)} \right] = \left[ \frac{1}{0.25} \right] = 0.25
\]

while \( \theta = 1, \sigma_e^2 = 0.5 \)

\[
\Delta P = \left[ \frac{1}{\left( \frac{1}{0.5} \right)} \right] = \left[ \frac{1}{0.5} \right] = 0.5
\]

These calculations make the one-to-one mapping for the case of a perfectly informative analyst’s forecast revision clear. Into this tidy world let us now introduce some noise by letting \( \sigma_e^2 \) takes on a value of 0.05, 0.1, 0.15 successfully while holding \( \sigma_e^2 \) constant at .25 for the time being.

III. Introducing “noise” into the IJ model

The impact of forecasts revisions upon price changes are now muted by the gradual introduction of noise into the signal about value conveyed by analysts’ forecasts/recconmatons. Now consider the impact of varying both earnings induced volatility \( \sigma_e^2 \) and “noise”, \( \sigma_p^2 \) over similar values to that considered above.

Prices changes over combined values of earnings
news and “noise”

Value of $\sigma^2$ $\varphi$

<table>
<thead>
<tr>
<th>Value of $\sigma^2$ $\varepsilon$</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>23.81%</td>
<td>22.73%</td>
<td>21.74%</td>
</tr>
<tr>
<td>50%</td>
<td>47.62%</td>
<td>45.45%</td>
<td>43.48%</td>
</tr>
<tr>
<td>75%</td>
<td>71.43%</td>
<td>68.18%</td>
<td>65.22%</td>
</tr>
</tbody>
</table>

Figure 2 generalises this exercise for equal increments of 5% in both these variance terms ($\sigma^2$ $\varepsilon$ and $\sigma^2$ $\varphi$). So I trace out price changes values of $\sigma^2$ $\varepsilon$ of 0.25, 0.30, 0.35, etc, and for all values of $\sigma^2$ $\varphi$ 0.102, 0.152, 0.202, 0.252, etc.
When this is done the dampening of the price impact of earnings information by the introduction of non-earnings “noise” is clear. Figure 2 shows that as “noise” increasingly masks the signal about value conveyed by the analyst’s forecast revisions is compromised and the slope of the implied price change - $\sigma_z^2$ locus becomes more shallow. At the extreme right-hand side of the horizontal axis is the AIR is sufficiently high that introducing “noise” has almost noticeable effect on price. But as we move left to lower levels of the AIR the impact of noise is far more dramatic. The diminishing impact of increments in the noise contained in analysts’ forecasts of value(the 5% increments in $\sigma^2$) can be detected by the gradual convergence in markers for the 16 5% increments in $\sigma^2$ considered in Figure 2 above.

**IV. Introducing “conflicts of interest”**

So far I have only considered changes in the variance of earnings and non-earnings signals given a fixed level of the signal received about value, $\theta$. But what if analysts biased their forecasts of earnings upwards to ensure their employer achieves the status of lead-underwriter in an upcoming IPO. In particular, what if the non-earnings element of value, $\phi$, is increased due to analyst’s conflicts of interest. So we can imagine two alternative forms of distortion in the distribution of analysts’ forecasts of earnings. These are

- Mean preserving increases in the spread (variance) of analysts’ forecasts whether by way of earnings or non-earnings (“noise”) information. I have considered the impact of these in the various numerical illustrations conducted above. Here noise is present, but has no impact on the optimism of analysts’ forecasts
A spread preserving increase in the mean-value of the signal about value, given by analysts’ in their forecasts and recommendations provided to their clients. This possibility of bias in the direction of signals about value provided by analysts is considered in the next section. Here the level of optimism of analysts forecast does not have any effect on the level of noise entering market prices.

So the trade-off produced by analysts conflicts in all likelihood mirrors a trade-off already much discussed in the literature (Lim (2001)) between two potential sources of misleading advice given to investors. These are

- **Bias**, which might be increased by the presence of conflict between an analyst’s desire to give profitable trading advice and a fear of annoying his employer’s investment banking clients,
- **Inefficiency**, which results from the non-earnings considerations entering the forecasts of earnings and issuance of trading recommendations. This could be induced by analysts desire to maintain good relations with senior management and so access to them.

While disclosure might be seen as an adequate response to the bias contained in conflicted analysts forecasts it is hard to see how this can resolve problems arising from the noise in the garbled signal about value contained in a conflicted analyst’s investment advice.
Somewhat ironically if analysts were known to add a 10% premium to all earnings forecasts for their investment banking clients a regulatory response based on disclosure would be largely effective in remedying potential investor losses. Investors could simply discount conflicted analysts’ forecasts by 10% to control for their compromised position.

It is even possible the access afforded by having a company as an investment banking client might improve the analyst’s forecast performance. Conflicted analysts may in these circumstances become a preferable source of investment advice. So the client of a self-confessed and disclosed conflicted analyst must calculate how the benefits and costs to him of retaining a conflicted analyst can best be traded off in his own self-interest. Recall Cain et al found in an experimental context simply knowing about a conflict of interest does not negate its impact. This allows non-value relevant “noise” to enter the signal about share price returns provided by analysts. Such noise can be self-perpetuating if noise-traders can “create their own space” (De Long, Shleifer, Summers and Waldmann (1990)). This is likely to be the case given the wealth of evidence that so much trade is motivated by “noise” rather than news about fundamental asset value (e.g. Cutler, Poterba and Summers (1989)).

V. Forecast efficiency when analysts are conflicted and markets are noisy

Analysts may best serve their investment clients by being conflicted if their conflicted status buys them better access to senior management and hence diminishes the forecast-error variance associated with their advice. Assuming analysts only concern is to best advise their clients by issuing the most accurate forecast possible (i.e there are no conflicts). Minimising mean square error requires minimising the function

$$\min_{b} E \left[ (\hat{X} - X)^2 \mid I \right] = \min_{b} b^2 + \text{Var} (X \mid I)$$

Where $X$ denotes the company’s earnings, $E(X \mid I)$ is the conditional forecast of $X$ given the information set available to the investor (past actual earnings outcomes, other analysts forecasts, etc) (see Lim (2001), p 371). And $b$ is the bias, or inaccuracy, in forecasting earnings, so

$$\hat{X} - E[X \mid I]$$

Where bias, $b$, is the difference between the forecast/recommendation the analyst actually issues and that which results from “telling it straight” based on the informational available about the company ($E[X \mid I]$).

For IJ this information would be limited to news about earnings alone. Since in the IJ model this is the exclusive valuation attribute. To make this model more tractable Lim (2001) makes some
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fairly standard assumptions which also are employed in the IJ model. These are that earnings, X are drawn from a normal distribution with mean zero and the information received by analysts reflects both information about earnings and some “noisy” element unrelated to “true” (earnings-based) value. The Bayesian precision of earnings is then simply the inverse of the forecast error variance

\[ \tau_0 = \frac{1}{\sum (X - E[X | I])^2} \]

This is of course very similar to IJ’s characterisation of the signal conveyed by an analyst (recall \( \theta = \varepsilon + \varphi \) whilst \( \varphi \overset{\text{N}}{\sim} (0, \sigma_{\varphi}^2) \)). For a forecast of earnings with these characteristics the analyst’s “loss-function” in forecasting earnings can be said to be to minimise the expression

\[ \text{Min}_b \left( b^2 + \frac{1}{\tau_0 + \tau_1(b)} \right) \quad (1) \]

This expression follows from the fact that for the normal distribution case the whole distribution can be characterised with reference to its mean and variance alone. Here the second term in the denominator of the precision of earnings, \( \tau_1(b) \) captures the precision of the bias in the analysts signal. The first term reflects in the denominator, \( \tau_0 \), reflects the underlying error in analysts’ forecasts of earnings which arises regardless of any compromise arising from analysts’ dealings with the company, or any desire they may have to pacify them. Now \( \tau_1(b) \) by contrast reflects a changing bias which investor’s can come to understand, predict and discount accordingly. While \( \tau_0 \) captures a potentially more damaging, erratic, fluctuating form of bias. This is unlikely to be well policed by systematic regulatory intervention. Of course there is no reason to think the state should ever want to intervene to reduce fundamental uncertainty about earnings anyway. But if volatility in the underlying (non-bias induced) fundamental uncertainty about earnings (\( \tau_0 \)) propagates swings in biased induced uncertainty (\( \tau_1(b) \)) then public policy needs to consider the impact of such interaction.

The analyst seeks to minimise equation \( (1) \) above. But while reduction in \( b \) reduces the first term in the minimand of equation \( (1) \) above, \( b^2 \) tends to raise the second term in the inverse of earnings volatility \( 1/\left(\tau_0 + \tau_1(b)\right) \) via its reduction of \( \tau_1(b) \). Note also that falling bias, \( b \), raises the proportional influence of non bias induced volatility in forecast errors in predicting earnings, \( \tau_0 \). So a market characterised by few conflicts of interest amongst the population of analysts following allows greater scope for the impact of noise-traders in pricing.

Given this loss-function an analyst adds value for his clients by being as accurate and reliable in his forecasts as possible. The problem isolated by Lim (2001) is that analysts may be required to trade-off these two desirable objectives. This might particularly be the case for loss-making firms who might
show the door to analysts they regard as being too candid about the likelihood of the company’s demise. In equation (1) above \( \tau^1(b) \) captures the optimal choice of forecast error variance by the analyst, conditional on the level of bias he exhibits in his forecasts \( (\delta \tau^1(b)/\delta b) \).

This implies analysts minimise the loss-function of equation (1) above with respect to the amount of bias in their forecasts to yield a solution.

\[
b = \frac{\tau^*(b)}{2(\tau_0 + \tau_1(b)^2)}
\]

(1.2)

This expression makes clear two important facts about the economic consequences of analyst’s bias. Firstly, the amount of bias is set to minimise error with respect to forecast error generated by volatility in bias itself, \( \tau(b) \), and volatility which bears no systematic relation to the underlying bias the analyst displays, \( \tau_0 \).

The relationship between these two elements of bias is non-linear and non-proportional. The latter element of analysts’ forecast error variance, unrelated to bias, could reflect in part “noise” unrelated to fundamental value. If it does so and such “noise” in the implied valuation increases as a proportion of overall forecast-error variance then such noise (within the denominator of the solution for \( b \)) gives scope for \( \tau_1(b) \) to rise without requiring a resulting increase in \( b \), that is greater overall bias .

Observe \( \tau_1(b) \) appears in both the numerator and the denominator of the minimised solution for bias. If the analyst simply desires to maintain a fixed level of bias he must reduce the dispersion of his bias to offset the implied increase in bias if non-bias related forecast variance increases. This reduction in the variance of forecast error is substantially less than the simultaneous increase in the non-bias related forecast error variance , \( \tau_0 \) (which I now denote simply “noise”) but still necessary if overall bias is not to rise. This outcome may induce perverse incentives for analysts to seek out and cover “noisy” stocks, i.e those where \( \tau_0 \) is comparatively high, where swings in the bias displayed by the analyst, or the unpredictability of his biased views, can be best masked. So the most difficult to predict stocks over time may tend to become those characterised by the most intense conflicts of interest amongst analysts covering the stock.

In evaluating the second term it is useful to scrub up some schooldays calculus. Recall the quotient rule

\[
\frac{\delta Y}{\delta X} = \frac{\delta(UV) - U\delta V}{V^2}
\]

for an expression of the form \( u/v \). If in the present case \( v \) is set equal to 1 and \( v \) is set equal to \( \tau_0 + \tau_1(b) \) we obtain

\[
1 \times \tau^*(b) = \left( \frac{\tau_0 + \tau(b)}{\tau_0 + \tau_1(b)^2} \right)
\]

Inserting this back into the while expression yields the result reported.
To see the underlying logic here I consider in Figure 4 the case of the solution for bias when the amount of non bias related forecast error variance, $\tau_0$, increases from 25% to 100% of forecasted value. If bias induced forecast variance is held at 25% as a proportion of total share price value then the overall level of bias observed rises from 62.5% initially, to 67.16% when non-bias variance is set to 50% and, finally, 72.45% when non-bias forecast-error variance reaches 100% of forecasted share value.

Figure 4 shows the decomposition of forecast-error variance which would be necessary to keep the optimal implied level of bias at 25% of forecast value. Consider an increase in non-bias related forecast error variance, $\tau_0$, rises from 25% to 50% and, finally 100%, as a proportion of forecast value, the forecast-error implies that the variance arising from fluctuations in the level bias contained in forecasts must fall from 63% (when non-bias induced forecast error variance is 25%) to 50% (when non-bias induced forecast error variance is 50%) to a final value of 30% (when non-bias induced forecast error variance is 100% of forecast value).
This numerical exercise suggests that unless the volatility induced by the activity of “noise” traders, who trade on factors unrelated to true value, is offset by greater observed stability in intentional bias strategically adopted by analysts then overall forecast bias will rise as a proportion of total share value. Observed levels of optimal bias in analysts’ forecasts will rise as “noise” traders dominate the market in a security unless strategic bias becomes more predictable in its effect i.e. bias induced error declines in its variance. Figure 4 supposes clients require that the advice they receive has a variance around true value of 25%. The implicit assumption being made here is that if the total forecast error variance of analysts’ advice regarding share price values rises above 25% of value then investors will simply no longer listen to the advice they give. This is shown by the line of circled points running parallel to the horizontal axis. So in the solution for optimal bias in equation (1.2) above we can ask what combinations of non-bias induced error (τ₀) and bias induced error (τ(b)) are consistent with maintaining that target bias. So a variance of non-bias related forecast error of 60% of total value is consistent with a roughly matching amount of variance in the direction of analyst induced bias, so τ₀=τ(b) in the solution for optimal bias equation (1.2) (70% for non-bias induced forecast error variance as against 71.34% for biased induced forecast error variance). But when non-bias related forecast error reaches 100% of value, bias induced variation must stay nearer 40% (41.37% exactly) to attain the overall target bias of 25%.

So biased, but well informed analysts, will be unmasked and under pressure to shift their coverage elsewhere in a market with few other sources of forecast error variance apart from their own compromised nature. The diminished dispersion of their bias induced error threatens their rapid exposure as compromised sources of advice. Analysts who find this denial of their strategic competitive advantage of issuing biased forecasts unpalatable are likely to move on coverage of more “noisy”, less fundamentals driven, type stocks when such a strategic advantage can be maintained. This would imply the most hard to predict stocks would attract the most easily compromised analysts to follow them. They would find such stocks attractive because they can more easily mask their deployment of strategically biased forecasts of value in such markets.

How robust a sector of a financial market is to the presence of noise-trading investors depends on how much those noise-traders agree in the non-value relevant motivations for trade and the extent to which arbitrageurs can further noise-traders’ demise by effectively counter-trading the asset back towards its fundamental value (Gilson and Kraakman, 2006, p40). It might be expected that market segments characterised by herding investor expectations and or systematic optimism in those expectations may be especially enticing to analysts who are based, but nevertheless well-informed. In such sectors conflicted analysts may
4 Numerical examples of noise-induced bias

In this closing section of the paper I briefly illustrate some comparative statics of the model. I specifically focus on the possibility that “noise” in the market makes bias more easily passed-off as plain error (just dumb luck) increases as a percentage of the overall forecast error. This happens because noisy stocks are more difficult to predict by their nature since their price movements are unrelated to any observable fundamental valuation attribute, in particular earnings in IJ’s model. So while in the previous numerical exercises I considered bias was held at some fixed critical level (25% of value in my example) here it can vary alongside the amount of noise present in the market.

But I begin by varying the amount of earnings uncertainty in the model and comparing its effect over increasing (here doubling) bias. I achieve this by simply raising the value of $\theta$ from 1 to 2 in equation (1.1) above. The impact on price change is seen to be proportionate as we might expect with a doubling of the bias in forecasts doubling their expected effect on price. This sort of mechanical relation might well be addressed by investors’ realisation that conflicted analysts’ trading advice needs to be scaled back before usage.

Figure 6 undertakes a very similar exercise of increasing amount of “noise” in a share-price while setting noise about fundamentals (here earnings,) to zero in equation (1.1) above. This figure shows us that impact of bias on expected price is slightly diminished as the market gets noisier. Hence given its impact is masked we might expect more biased forecast/recommendations to be issued by analysts to maintain a constant price impact.

If bias in analysts’ forecasts, $\theta$, can generate more “noisy” investor expectations of earnings and hence prices (via $\sigma_{\epsilon}^2$). I allow this sort of noise induced propagation of by altering equation (1.1) ’s specification to allow price change to be an increasing function of the amount of noise-induced variance in the market. Figure 6 shows how such a comparative static exercise works out.

I. The proportional specification

Consider if bias, $\theta$, is simply grossed-up by factor reflecting “noise” volatility (or $\sigma_{\epsilon}^2$). So price change given by an adapted form of equation (1.1) given in equation (1.2) given below

$$\Delta P_t = (P_t^{\text{new}} | \theta_t) - P_t = (\theta \times \sigma_{\epsilon}^2) \left[ \frac{1}{\frac{(1 + \sigma_{\epsilon}^2(t))}{\sigma_z^2(t)}} \right]$$
In this adapted form the price response is simply scaled up by the amount of “noise” (captured here simply by $\theta$) in the market.

**Figure 5; implied price change as the bias rises**  
$(\theta=1$ to $2)$

**Figure 6: Implied price change as bias rises in a noiseless and noisy market**
Figure 7: Change in the implied price for the proportional model (using equation 3)

Figure 8: Impact of bias induced noise (as θ goes from 1 to 2)

Figure 7 show the effect of varying “noise” induced variance across increasingly biased forecasts/recommendations (an increase in θ from 1 to 2 as before, holding $\sigma^2_\varepsilon$ at 10% as before), using the proportional specification of the interaction between noise and bias of equation (1.3) above. The increasing price impact of “noise” induced volatility is clear in Figure 7. Noise exacerbates the impact of bias in inducing price change, but its impact wears off at high levels of noise when analyst’s advice is highly unreliable anyway. Once again it is the bunching of AIR increments in the upper left hand section of Figures 7 and 8 that capture this gradual diminution in the value of analysts’ advice.

Figure 8 traces the effect of noise induced bias on the increment in price change (this is the second derivative, rate at which price change is increasing) as bias is doubled (i.e. θ goes from 1 to
The re-enforcement of bias and induced by the presence of noise-traders is clear, but the dampening out of its effect is also clear as we reach values of above 40%. Once noise trade dominates a market it may not matter if analysts’ forecasts/recommendations are noisy as few people heed them anyway in setting prices.

In any numerical simulation the results presented can only reflect the specification chosen to illustrate the economic phenomena under discussion (equation (1.2) in this case). To show that noise induced bias does can indeed induce bias to be more prevalent in the market I show the result is not simply product of the choice of the specification in equation (1.2) alone.

II. The portfolio variance specification

I do this by repeating the exercise presented in Figures 7 and 8 using an alternative specification of the form of equation (1.3). This grosses up the price response not by the level of noise variance, \(\sigma^2\) but rather by the portfolio variance of an equally weighted portfolio of assets whose volatility is in induced by noise and earnings movements.

\[
\Delta P_t = (P_t^{new} | \theta_t) - P_t = \left(\sigma^2_p \times \sigma^2_{\psi(t)}\right) \left[ \frac{1}{\left(1 + \frac{\sigma^2(t)}{\sigma^2_{\psi}(t)}\right)} \right]
\]

where

\[
\sigma^2_p = \sqrt{x_{\epsilon}^2SD_{\epsilon}^2 + x_{\phi}^2SD_{\phi}^2 + 2x_{\epsilon}x_{\phi}SD_{\epsilon}SD_{\phi}\rho_{\epsilon\phi}}
\]

and \(x_{\epsilon}\) and \(x_{\phi}\) are the weights on noisy and earnings induced variance assets. I set \(x_{\epsilon}=x_{\phi}=0.5\) in this simple numerical exercise and then \(\rho_{\epsilon\phi}\) increments of 1% are considered to trace out their impact on the AIR the chosen metric of how information analysts’ advice about value is to investors. I assume in my calculations as the noisiness of stocks increases, i.e. \(\sigma^2_{\psi}\) rises \(\rho_{\epsilon\phi}\) falls. In this simple numerical simulation the correspondence is assumed to be inversely proportional. So a 5% increase in \(\sigma^2_{\psi}\) cuts \(\rho_{\epsilon\phi}\) by 5% in this example. Until \(\rho_{\epsilon\phi}\) equals zero when \(\sigma^2_{\psi}\) reaches 100% (I fix \(\sigma^2_{\epsilon}\) at 25% here to prevent the portfolio variance falling to a very small number). As before, under the proportional specification in equation (1.2) above, the price impact of bias is maximised at moderate level before the value of investment advice itself begins to be eroded in a noisy market.
Figure 9 and 10 produce somewhat similar patterns to Figures 7 and 8 respectively, just that here the price impact of bias peaks earlier and declines more rapidly as noise-trader induced variance floods the market. I conclude that a variety of simple intuitive specifications are consistent with my basic argument that increased noise in a market intensifies the price impact of bias, although that impact is soon eroded if noise rises above some “critical”, typically fairly low, level. In markets dominated by noise-trader induced variance the value of investment advice itself is increasingly called into question by investors eager to receive only value relevant advice.
5 Conclusions

This paper has considered the impact of “noise” traders on public-policy implications of financial regulation of analysts’ conflicts of interests. As has been seen the FSA and the US courts both show considerable reliance on a fairly traditional conception of how an efficient capital market operates. Notably the FSA has exhibited a strong preference for self-regulation and disclosure based remedies to the problems arising from analysts’ conflicts of interests. The US Courts seem even willing to accept share price movements as indicators of appropriate damages in “fraud on the market” claims. I have argued that a caution to such a public policy response is the possible presence of non-earning related, “noise”, traders, or those “who trade because they wish to trade”. In markets where noise has not yet eroded the market value of investment advice noise-trader induced variance can intensify the price impact of analysts’ bias. Such noise-trade suggests limits on a “buyer beware” solution and further casts doubt on the possibility of “one size fits all” responses to these conflicts in general. In moderately “noisy” sectors, or epochs, a more interventionist stance to counter investor losses from disclosed conflicts may be justified. A one size fits all disclosure based regulatory policy, of the type currently advocated by the UK FSA, is unlikely to be the most suitable policy response to conflicts of interest.

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