MAKER-TAKER PRICING AND CONFLICTS OF INTEREST IN U.S. EQUITY MARKETS

By Shane A. Corwin

All U.S. equity markets now use some form of maker-taker pricing. In the traditional maker-taker model, exchanges charge liquidity demanding orders (i.e., marketable orders) a fee and rebate a portion of the fee back to liquidity supplying orders (i.e., nonmarketable or standing limit orders). The difference between the take fee and make rebate is an important source of revenue for the exchange and competition among exchanges results in a high correlation between an exchange’s fee and its rebate. Thus, venues charging high take fees also tend to pay large liquidity rebates. The maximum allowable take fee under Reg-NMS is 0.3¢ per share, but there is considerable variation across venues. In particular, a few exchanges recently began using inverted fee schedules that charge liquidity supplying orders and pay rebates to liquidity demanding orders. Notably, maker-taker pricing leads to an inherent conflict of interest between brokers and their clients and this conflict has recently gained the attention of both regulators and lawmakers.

Although the SEC’s Order Protection Rule establishes price priority in U.S. equity markets, the rule does not specify who trades first when multiple venues offer the best posted price. As noted by Angel, Harris, and Spatt, across-exchange differences in fee schedules create situations in which equally priced, nonmarketable limit orders resting on separate exchanges have different ‘net price’ priority. All else equal, when two venues offer the best price, one expects liquidity demanders to first route their orders to the venue with the lower take fee. In contrast, liquidity suppliers have an incentive to route to the venue that pays the largest make rebate. Differences in fee structures can therefore affect both the arrival rates of marketable and nonmarketable orders at the various venues, and the queue lengths in the respective limit order books. In turn, these differences can lead to variation across venues in execution quality, both in terms of the likelihood/speed of a fill and the quality of the fill.

Consider two identical limit orders to purchase 100 shares of ACME Corp, at $10.25 per share, one resting on a high fee/high rebate venue and one resting on an inverted venue. If negative news arrives and pushes the price of ACME down to $10.00, both limit buy orders will execute and both receive a ‘bad fill’ (i.e., the price moves against them after execution). In this case, order routing does not affect execution quality, so the order may as well earn the large liquidity rebate. In contrast, suppose

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that just one 100-share market sell order arrives, after which the price of ACME increases to $10.50. In this case, the fee-sensitive market order is likely to execute against the limit order on the inverted venue, while the limit order on the high fee venue goes unexecuted and misses out on a‘good fill’ (i.e., profitable trading opportunity). This example illustrates that the limit order on the high fee/high rebate venue is less likely to execute than the limit order on the low fee/low rebate venue, and is also more likely to receive an execution when the price moves against them than when the price moves in their favor.

The related conflict of interest arises from the fact that most brokers do not pass fees and rebates through to their customers, but instead charge a fixed commission that reflects fees, rebates, and the other costs of doing business. Thus, while investors may prefer the venue offering the highest likelihood of a fill, the broker has an incentive to maximize liquidity rebates.4 Further, the ability of competition to align the incentives of the broker and customer is hampered by an important agency problem. Brokers that maximize rebates may be able to charge lower commissions. If investors choose brokers based primarily on commissions (perhaps because they lack the sophistication and/or the necessary information to evaluate limit order execution quality), it may be profit maximizing for brokers to focus on liquidity rebates rather than the probability of execution when making order routing decisions.5 A subtle but very important point here is that, because their orders do not trade, customers whose limit orders go unfilled cannot be made whole through lower brokerage commissions.

In our recent working paper, my coauthors and I present evidence from Rule 606 filings that four popular retail brokers make order routing decisions that are consistent with the goal of maximizing liquidity rebates. Specifically, these brokers appear to route their customers’ marketable orders to wholesalers that purchase order flow and route their customers’ standing limit orders to a single exchange that pays the maximum liquidity rebate. Using both proprietary limit order data and publicly available trade and quote data, we then present evidence that limit orders routed to venues with lower take fees are executed more frequently, executed faster, and suffer less adverse selection, than orders on high fee venues. Our results suggest that the decision to utilize a single venue that offers the highest liquidity rebate is inconsistent with the objective of obtaining best execution for customer limit orders.

Given our evidence that the conflicts resulting from maker-taker fees appear to affect order routing decisions and lead to inferior execution quality for at least some customer orders, what are the potential policy prescriptions for eliminating or reducing these conflicts? In our view, there are three potential approaches to mitigating this conflict. The most aggressive approach is to completely eliminate maker-taker pricing. However, while this approach would eliminate the conflict, it is quite possible that other, less transparent methods to attract order flow could arise in its place. A second approach is to mandate that fees and rebates be passed through to the customer. While this approach would also eliminate the inherent conflict of interest, it is our understanding that many institutional customers are not in favor of this approach. In particular, institutional investors who trade for multiple accounts may prefer a fixed, known commission framework, which allows them to more easily allocate trades across customer accounts in real time. The least aggressive approach, and the one we recommend, is to require brokers to rigorously demonstrate that their routing practices ensure best execution for their clients, while recognizing that the likelihood of a fill should be the prominent consideration for limit order execution. At the same time, regulators should improve related disclosures to allow better monitoring of brokers and more information to end customers.

Shane Corwin is an Associate Professor of Finance at the University of Notre Dame. He can be reached at scorwin@nd.edu


2 These conflicts were one of the subjects of a June 17, 2014 hearing on Conflicts of Interest, Investor Loss of Confidence, and High Speed Trading in U.S. Stock Markets before the Senate’s Permanent Subcommittee on Investigations.

3 For example, a market buy order executed on a traditional maker-taker venue pays the offer price plus a fee, whereas a similar order executed on an inverted venue pays the offer price less a rebate (see Angel, J. J., L. E. Harris, and C. S. Spatt. 2011. Equity Trading in the 21st Century. The Quarterly Journal of Finance 1(1): 1-53).

4 This conflict of interest is similar in some ways to the agency conflict created by payment for order flow (see, for example, Macey, J. R., and M. O’Hara. 1997. The Law and Economics of Best Execution. Journal of Financial Intermediation 6(3): 188-223). However, while payment for order flow serves as an inducement to attract uninformed marketable orders, the conflict we examine here relates primarily to standing limit orders.

5 In fact, even if investors walk away from the market when their standing limit orders do not execute, it can be revenue maximizing for brokers to route to the venue with the higher rebate and lower fill rate. In this case, optimal routing would depend on order size and differences in expected fill rates across venues.

HIGH FREQUENCY ARBITRAGE AND LIQUIDITY

By Thierry Foucault, Roman Kozhan and Wing-Wah Tham

Arbitrage is a cornerstone of modern finance theory. By enforcing the Law of One Price (LOP), arbitrageurs make prices more efficient. Arbitrageurs are therefore usually viewed as playing a positive role in financial markets.

The Securities and Exchange Commission’s (SEC (2010)) concept release on equity market structure asks whether arbitrage strategies implemented by high frequency traders benefit or harm the interests of long-term investors. At first glance this question seems misplaced: by correcting any deviations from the LOP increasingly faster, high
frequency arbitrageurs should make prices more efficient. And recent evidence suggests they do. However, pricing efficiency is just one dimension of market quality. Liquidity is another important dimension.

In a new paper, we argue that gains in pricing efficiency at high frequency can come at the expense of lower liquidity and we provide evidence supporting this claim. The reason is that arbitrage opportunities can come from asynchronous price adjustments to new information. In this case, in enforcing the LOP, arbitrageurs expose liquidity suppliers to the risk of trading at stale quotes (“being picked off”). Through this channel, high frequency arbitrage can impair liquidity because liquidity suppliers require a compensation for the risk of being picked off.

Consider, for instance, an ETF tracking the S&P500 index. Suppose that market-wide positive news arrives and that, in consequence, the price of the ETF immediately jumps up. In contrast, prices of some stocks in the S&P500 index react with a small delay, which gives rise to an arbitrage opportunity. Very fast arbitrageurs can sell the ETF and buy the underlying basket of stocks with marketable orders at a profit. This profit comes at the expense of liquidity suppliers in underlying stocks because they trade at stale prices given the information triggering the price move in the ETF.

Thus, asynchronous price adjustments to information across markets generate “toxic” arbitrage opportunities: they are a source of adverse selection costs for liquidity suppliers. Liquidity suppliers can reduce this cost by also being very fast. Indeed, they do not lose to arbitrageurs if they update their quotes before arbitrageurs pick them off. Thus, when a toxic arbitrage occurs, arbitrageurs and liquidity suppliers are engaged in a race (“the arbitrage race”): the former strive to hit quotes before they are cancelled by the latter. Ultimately, adverse selection costs generated by toxic arbitrage opportunities should be larger when arbitrageurs win the arbitrage race more frequently.

We provide evidence supporting this hypothesis using data on triangular arbitrage opportunities in currency markets over two years (2003-2004). In our data, these opportunities last less than one second on average, precisely because traders correct them very quickly, just as high frequency traders do in today’s markets. We split arbitrage opportunities into two groups: (i) those due to asynchronous price adjustments in rates of different currency pairs and (ii) those due to transient shifts in the rate of one currency pair. We refer to arbitrage opportunities in the first group as “toxic” and to those in the second group as “non-toxic” since they are less likely to be due to stale quotes.

Toxic arbitrage opportunities accounts for about 41% of all arbitrage opportunities in a given day on average in our data. Furthermore, on average, an arbitrageur wins the arbitrage race when a toxic arbitrage opportunity occurs more than 2/3 of the times in our sample. This odds ratio however varies significantly from day to day. Thus, we analyze whether illiquidity is higher on days in which arbitrageurs win the arbitrage race more frequently.

We find that this is indeed the case. In line with our hypothesis, illiquidity (e.g., quoted and effective bid-ask spreads) for the currency pairs in our data is higher on days in which the odds that arbitrageurs win a toxic arbitrage race are higher. In our data, a 1% increase in the likelihood that an arbitrageur wins this race raises quoted bid-ask spreads by 4% on average. We also find a strong and positive association between the fraction of arbitrage opportunities that are toxic in a given day and illiquidity on this day for currency pairs in our sample. Specifically, a one standard deviation increase in the fraction of arbitrage opportunities that are toxic leads to a 3% increase in bid-ask spreads in our sample.

Our findings suggest that, at the high frequency, there is a trade-off between pricing efficiency and liquidity: fast arbitrageurs’ reaction to toxic arbitrage opportunities enhances pricing efficiency but it raises adverse selection costs for liquidity suppliers. However, one must be careful in interpreting our findings. They do not imply that high frequency arbitrage is uniformly bad for liquidity. Indeed, in responding fast to non-toxic arbitrage opportunities, arbitrageurs might contribute to liquidity provision. Consider again the ETF example but assume now that the ETF price increases temporarily because one investor has a large demand for this ETF. By selling the ETF, arbitrageurs provide liquidity to this investor. Furthermore, as the price increase in the ETF is transient, the arbitrageur’s buy orders in underlying stocks do not execute at stale quotes. Thus, arbitrageurs’ orders in non-toxic arbitrage opportunities should enhance rather than impair liquidity.

How could one alleviate harmful effects of fast arbitrage without losing its benefits? One solution is to delay the execution of marketable orders by a small random delay. The advantage of this approach is twofold. First, liquidity suppliers retain the option of not changing their quotes and trade with arbitrageurs if they find it beneficial. Second, it does not slow down those posting non-marketable limit orders. Hence, it tilts the odds of winning the arbitrage race in favor of liquidity suppliers (holding investment in speed constant). This approach might increase by a few milliseconds the time required to correct an arbitrage opportunity but it should reduce liquidity suppliers’ exposure to toxic arbitrage trades. The loss for pricing efficiency should be small but the liquidation gain could be significant.

Thierry Foucault is HEC Foundation Chair and Professor of Finance at HEC. He can be reached at foucault@hec.fr
Roman Kozhan is an Associate Professor of Finance at Warwick Business School. He can be reached at Roman.Kozhan@wbs.ac.uk
Wing Wah Tham is an Assistant Professor of Financial Econometrics at the Erasmus School of Economics. He can be reached at tham.ees.eur.nl


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WHY AND HOW THE GOVERNMENT SHOULD ASSESS THE COSTS AND BENEFITS OF FINANCIAL REGULATIONS

By Eric A. Posner and E. Glen Weyl

Cost-benefit analysis (CBA) is used by most regulators to evaluate proposed regulations. The EPA, for example, has relied on CBA to justify new regulations that will reduce the emissions of greenhouse gases by power plants. Yet financial regulators have not traditionally used CBA to analyze or justify financial regulations. Exactly what considerations they rely on to determine regulations like minimum capital requirements have never been clear; they have largely acted on an ad hoc basis subject to limited review. But this approach is no longer tenable. Increasingly, industry, courts, and Congress are demanding that financial regulators use CBA. Unfortunately, the financial regulators have been caught off guard, and are not in a position to meet these demands. Unlike EPA and other non-financial regulators, they do not have any protocols, templates, or guidance documents to rely on.

In a series of articles (Posner and Weyl, 2013a,b; Posner and Weyl, Forthcoming a,b), we have sketched out how financial regulators should engage in CBA. A CBA is a decision-procedure that requires the regulator to calculate costs and benefits based, as much as possible, on reliable data. Some of the impacts of regulations are easy to estimate, such as the lost profits to firms.

However, financial regulations can produce a wide range of benefits and costs that are more difficult to calculate. We have identified four basic categories of these less easily measurable benefits and costs. First, a financial regulation may be beneficial in that it reduces the risk of a financial crisis, which can both destroy valuable assets and result in a general economic downturn. Second, a financial regulation may change incentives to obtain information about asset values—in the ideal case either reducing wasteful races to be first to obtain information or improving incentives to acquire information when early acquisition benefits the real economy. However, a financial regulation may also cause harm by reducing the incentives or ability of individuals to usefully provide information to the economy through financial market prices. Third, a financial regulation may reduce incentives for wasteful speculation or gambling, where people take on risk without generating social benefits. However, a regulation may harmfully limit individuals’ ability to reduce risks through hedging and insurance. Fourth, a financial regulation may beneficially reduce the excessive supply of credit to naïve and/or risky consumers but may harmfully restrict credit to firms that are credit-constrained.

The major problem for the financial regulators is quantifying these benefits and costs. As a matter of theory, the exercise is straightforward. A regulation that reduces risk-taking by financial institutions also reduces the risk of a financial crisis. Multiply the change in probability of a financial crisis by the social cost of a financial crisis, and you have the expected benefit of the regulation. Can either the probability or the loss be estimated? Historical data exist for both variables, and they at least are a starting point for making estimates. John Coates (2014) is skeptical that such estimates will ever be more than guesswork. We are more optimistic. We know from other areas of government regulation that the introduction of a CBA mandate will stimulate regulators to hire economists who will collect data, refine methodologies, and improve analysis.

Let’s now focus on the problem of high-frequency trading (HFT). Many commentators believe that HFT is socially wasteful. The major reason is that it enables rent-seeking that creates little social value. As argued by Hirshleifer (1971), a firm’s “foresknowledge” of information that will be incorporated into market prices anyway only slightly accelerates the pace with which that information is incorporated, a service that has little or no value if the acceleration occurs only over a very short time horizon, but allows the accelerating firm to achieve all the profits from arbitraging this informational gap. The very real costs of this activity, such as the hundreds of millions of dollars spent building a tunnel to allow a few milliseconds’ faster communication between Chicago and New York, are borne by other market participants in the form of worse trading prices and/or less liquidity. Budish et al. (2013) argue that replacing continuous time markets with frequent batch auctions, where trades are cleared simultaneously and frequently (say once per second) rather than in sequence, would have limited or no costs while deterring investors from wasting resources on high frequency trading.
While this proposal is compelling, it falls short of eliminating most wasteful arbitrage opportunities, which do not occur over such short time horizons. For example, a firm that learns a week ahead of rivals through statistical analysis that certain assets are severely mispriced or learns of a persistent but extremely small mispricing, such as that based on weather patterns recently discovered (Dong and Tremblay, 2014) adds limited social value (Posner and Weyl, 2013b). Eliminating such waste would require imposing less obviously beneficial regulations such as mandated random and significant delays in transactions (to screen out short-term arbitrages) or instituting a “Tobin” tax on financial transactions (to screen out small arbitrages).

In this case, the benefits of such regulation could be tabulated by determining the volume of resources, human and material, devoted to such wasteful arbitrage activity—a tedious, but straightforward accounting exercise based on audits of trading strategies of hedge funds and proprietary trading desks of investment banks. Much of this information is already available to public authorities based on stress tests and historical, rather than current, data could be used. Net costs could be determined based on an estimate of the elasticity of real economic activity with respect to such small and short-lived price changes, based on event studies of news events that were reversed quickly or induced small price changes, using the standard price theoretic formula for deadweight loss of distorted prices we discuss in Posner and Weyl (2013b).

As Budish et al. point out for very short delays and as Stiglitz (1989) highlights for a very small tax, in the limit as the interventions become small they are very likely to be beneficial. But larger interventions will be harder calls and CBA should be used to calculate the optimal size and nature of such interventions.

Some commentators like Coates (2014) worry that a CBA requirement would block regulation rather than facilitate efficient regulation. Under current law, courts are relatively deferential to agency regulation. If a CBA mandate existed, then courts would be unreasonably demanding. Because CBA requires judgment calls, courts that are hostile to regulation will almost always be able to find things to disagree with. We do not think that such judicial hostility is inevitable, but even if it is, CBA could be implemented as a bureaucratic rather than legal requirement. The burden of providing a valid CBA could also be put on the regulated party rather than on the regulator, as we argue in Posner and Weyl (2013a).

Eric Posner is Kirkland and Ellis Distinguished Service Professor of Law at the University of Chicago. He can be reached at eposner@uchicago.edu

Glen Weyl is an Assistant Professor of Economics at the University of Chicago. He can be reached at weyl@uchicago.edu

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a result of RMBS and CMBS downgrades, as well as the large decrease in actual capital from write-downs of the book value of these securities. Collectively, these actions placed an enormous strain on insurers’ balance sheets at a time of severe market stress and resulted in a double hit to insurers’ primary measure of capital adequacy, the ratio of actual to required capital referred to as the risk-based capital (RBC) ratio.

In response to the impact on insurers’ balance sheets of RMBS and CMBS downgrades, the NAIC changed its methodology for capital adequacy assessment in two ways. First, it replaced credit ratings as an indicator of expected losses with potentially more precise estimates provided by PIMCO for RMBS starting in 2009 and BlackRock for CMBS starting in 2010. Second, it removed the double penalty of a security downgrade on an insurer’s RBC ratio by recognizing that an insurer’s expected losses depend on the security’s carrying value. Under the prior regime using credit ratings, all insurers who hold the same security have the same capital charge regardless of whether they hold the security at amortized cost or fair value. The use of credit ratings to calculate required capital implicitly assumes that the expected loss of a security is relative to its amortized par. However, as the carrying value of the security declines, the expected loss facing an insurer is lower, a relationship that is explicitly recognized under the new regime. Thus, if an insurer impairs the value of the security to account for all its expected loss, the amount of required capital it needs is less than if it held the same security at amortized par. We estimate that this change in the methodology of determining required and actual capital saved insurers in our sample $4.8 billion in regulatory capital.

Using Schedule D filings of over 4,000 individual insurance companies, we examine whether the NAIC’s decision to remove references to credit ratings and to change the methodology for assessing capital adequacy for insurers’ holdings of RMBS and CMBS, reduces the systemic risk effects of forced asset liquidation: one of three transmission channels of systemic risk identified by the Financial Stability Oversight Council in designating non-bank systemically important financial institutions. We find that the probability of quickly selling downgraded RMBS and CMBS is reduced after the regulatory change and that insurers with the largest amount of risk-based capital (RBC) saved have the largest reduction. We document a similar effect on the probability of gains trading corporate bonds after the regulatory change. Replicating the analysis of Ellul, Jotikasthira, Lundblad, and Wang (2013), we show that life insurers, in particular, are significantly less likely to trade after the NAIC adopts the new regulations and the likelihood decreases in the amount of RBC saved.

In addition to the selling of distressed securities and gains trading, insurers may also repair regulatory capital by raising external funding. Koijen and Yogo (2013) and Berry-Stölzle, Nini and Wende (2013) show that life insurers that are affected by losses in variable annuity contracts are more likely to fire-sell policies and raise external financing to shore up regulatory capital. We examine whether the regulatory change affected insurers’ financing behavior and show that life insurers are less likely to raise additional capital, the larger their RBC savings.

Finally, under the new regulations, insurers are no longer constrained by high capital requirements from purchasing lower-rated securities in the secondary market. We find evidence that the credit quality of insurers’ secondary market purchases of RMBS, and to some degree CMBS, declines after the regulatory change and insurers with greater regulatory capital savings have larger declines.

One benefit of allowing insurance companies to purchase downgraded RMBS and CMBS is that their purchases can alleviate price pressure from sellers in times of market stress. However, this benefit must be weighed against the possible incentive to reach for yield by purchasing lower credit quality debt (Becker and Ivashina (2013)). Our findings suggest that financial regulators should either mitigate this incentive or ensure that capital charges accurately reflect the risk of investment assets when proposing any regulations that shift from using credit ratings to using valuation models for regulatory purposes.

Kathleen Weiss Hanley is a Visiting Associate Professor of Finance at the University of Maryland and Stanislava Nikolova is an Assistant Professor at the University of Nebraska-Lincoln. Hanley can be reached at khanley@rhsmith.umd.edu and Nikolova at snikolova2@unl.edu.

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1 Required capital refers to insurers’ adjusted risk-based capital and actual capital refers to insurers’ economic capital reported using statutory accounting rules rather than Generally Accepted Accounting Principles (GAAP).
2 Carrying value refers to the book adjusted carrying value of a security in an insurer’s asset portfolio. The book adjusted carrying value is either the security’s historical amortized cost or its fair value as determined by statutory accounting rules.
3 The interpretive guidance also describes three channels the Council believes are most likely to impact firms and markets, thereby posing a threat to U.S. financial stability: (i) exposure of creditors, counterparties, investors, or other market participants to a nonbank financial company; (ii) disruptions caused by the liquidation of a nonbank financial company’s assets; and (iii) the inability or unwillingness of a nonbank financial company to provide a critical function or service relied upon by market participants and for which there are no

“We find that the probability of quickly selling downgraded RMBS and CMBS is reduced after the regulatory change.”
WHAT DO “SMART PHONES”, “FREE SPEECH”, AND “HUMANITARIAN CRISIS” HAVE IN COMMON?

By Paul A. Griffin, David Lont and Yuan Sun

These unlikely bedfellows all connect when it comes to a brand new SEC filing, Form SD, Specialized Disclosure Report. This form, which has its origins in the Dodd Frank Act of 2010, requires for the first time that more than one thousand U. S. public companies file a conflict minerals report (Form SD), due this year by the compliance deadline of June 2, 2014 (the first weekday after the official date of May 31). These disclosures relate to the possible use of conflict minerals (tin, tungsten, tantalum, and gold) mined in the Democratic Republic of Congo (DRC) or adjoining countries in U. S. company’s supply chains or manufacturing processes. A fundamental goal of Section 1502 of the Dodd Frank Act is that U. S. companies investigate the origin and use of conflict minerals in their products and disclose to the public certain aspects of that investigation.

By re-sourcing their conflict minerals elsewhere in an effort to be DRC conflict free, U. S. companies’ actions and disclosures potentially could have the effect of lessening the epic human tragedy in Central Africa. As a secondary benefit, the rule might also mollify the concerns of investors and consumers, who would now make more informed choices about whether their smart phones (and a long list of other consumer products) might relate or might not relate to the violence in Central Africa over the mining of conflict minerals.

The central hypothesis of our study is that companies’ disclosure about their investigations of the potential use of conflict minerals can impose substantial costs on American companies. An analysis of cost is critical for effective regulation and, in fact, while not mandatory, the SEC deems it “essential” that such analysis be conducted for proposed and enacted rules. Regarding Form SD, the SEC has estimated that the total cost imposed on U. S. companies would be $3 billion to $4 billion in the first year, with reduced costs in later years. By adopting the rule, the lawmakers have implicitly assumed that these costs pale in relation to the expected social and economic benefits of averting human suffering.

These costs, however, tend to be the out-of-pocket costs to an issuer of complying with the rule. Thus they do not include a vast array of indirect costs, in particular, stakeholders’ possible negative reactions to the new rule, which could relate to matters such as the costs of a potential reassessment of company risk and the uncertainty of reaction from customers and suppliers about future operations. In addition, the U. S. Court of Appeals in May of this year introduced a third cost to the conflict minerals rule, the cost of abridgment of free speech. According to the Court, the requirement for companies to disclose that their product components may have originated in the DRC was tantamount to stigmatizing companies’ right to freedom of commercial speech, including the right to silence. The Court struck down that part of the rule as too costly to free speech because it compelled a company to “confess blood on its hands.” Consequently, it appears that any disclosure under the rule that a company is not DRC conflict free would be purely optional for the company.

To assess the full set of direct and indirect costs imposed by section 1502, we conducted an event study of equity investors’ reactions to all voluntary first-time disclosures made by companies in an SEC filing in 2010-2012, prior to the adoption of the final SEC rules on August 22, 2012 and the more recent court rulings. We also examined the reaction of an otherwise equivalent (matched) sample of companies that did not make conflict minerals disclosures but could reasonably be expected to make disclosures given the close similarity of the matched and disclosure samples. We tested for a positive stock price effect (because investors reward the company for increased disclosure transparency) or a negative stock price effect (because investors penalize the company for expected higher costs from conflict minerals implementation and compliance and the costs of re-sourcing conflict minerals). The results showed a statistically significant negative reaction around the dates of these voluntary disclosures; and this reaction was most apparent for smaller companies and companies with less analyst coverage. For these companies, which are normally considered to have limited public information, voluntary conflict minerals disclosures constitutes fresher information in general. The matched sample showed an equivalent negative reaction. We contend this negative reaction occurred for the matched sample because the discloser companies transferred negative information to the non-discloser companies and, possibly, because the market penalized non-discloser companies for their intransparency regarding conflict minerals.

We also measured the overall economic significance of our results by multiplying the daily stock return adjusted for market-wide movements by the market capitalization of each company as of each day to calculate the overall daily shareholder gain or loss for each company. For our sample of 103 disclosures made by 59 companies, the aggregate loss of shareholder value amounted to $6.5 billion when measured

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over days -1 to 10 around the disclosure date (day 0) and $13.1 billion when measured over disclosure days -1 to 20. These measures of economic cost well exceed the SEC estimates of $3 billion to $4 billion in the first year. Despite our higher market-based cost estimates, we also view these measures as conservative. This is because they estimate the cost for only a subset of potential disclosers, and not the larger set of all SEC-affected companies. They also focus on company-specific voluntary disclosures only and, thus, do not incorporate the stock price effects of related regulatory events such as the passage of Dodd-Frank in 2010, to which investors also reacted negatively according to published research.

Our study also offers insights into investors’ likely reaction to the first-time SD reports. Given the last minute intervention of the courts in limiting the number of SD filers and the information included therein, rather than adding clarity for investors as intended, this may simply create more uncertainty, as many investors will still be unsure about U. S. companies’ use of conflict minerals. Moreover, those companies that exercise their free speech right not to disclose could possibly be seen as withholding adverse information, when others may do the opposite by signaling positive corporate actions that deny financial gain to armed groups in the RPC and adjoining countries.

This unfinished story about the costs and consequences of conflict minerals disclosure will continue to worry the financial markets. While our study suggests that the Section 1502 rule has already imposed significant costs on investors based on our finding of a negative stock price response to first-time voluntary disclosures in 2010-2012, today’s regulatory and disclosure uncertainty surrounding the first-time SD filings would seem little different to the circumstances we studied in our research.

To test this idea, we measured the percentage change in stock price in excess of a market-wide index around the initial SD filing dates (mostly on June 2nd). While prices for the larger firms did not budge, smaller firms lost almost 2% of market capitalization over days -1 to 1 around the SD filing date; and those firms whose SD filing indicated that their supply chains used North Korea gold lost even more, about 3% over the same interval. Interestingly, many of those filers have since claimed that the listing of North Korea was a mistake in country coding, and have filed a corrected SD filing. More importantly, these recent results suggest that the current set of reports has added yet another layer of cost, especially for smaller firms, to what our research shows is an already burdensome disclosure rule.

A complete copy of our study was recently published in a special issue on sustainability of the Pacific Accounting Review (DOI: 10.1108/PAR-04-2013-0023).

Paul A. Griffin is a Professor of Management at UC Davis Graduate School of Management. He can be reached at pagriffin@ucdavis.edu
David Lont is a Professor of Accounting at the University of Otago. He can be reached at david.lont.otago.ac.nz
Yuan Sun is an Assistant Professor of Accounting at Boston University. She can be reached at yesun@bu.edu

References:

a Graduate School of Management, University of California, 1 Shields Avenue, Davis, Davis CA 95616, United States
b School of Business, University of Otago, 60 Clyde Street, Dunedin, 9054, New Zealand
c School of Management, Boston University, 595 Commonwealth Avenue, Boston, MA, 02215, United States