Security Recommendations and the Liabilities of Broker-Dealers*

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Abstract

I investigate the liabilities of broker-dealers from the arbitration of investor claims relating to security recommendations. I find that investor awards are more positive for claims involving securities that are more difficult to evaluate, and that the more positive awards relate to investor assertions of a fiduciary duty violation and to investor assertions of a suitability violation. I also find that the length of the arbitration, a measure of the cost of arbitration and a proxy for the potential difficulty of the two parties to directly settle the dispute, are greater for these claims. Overall, the results indicate that broker-dealers can have additional liabilities when recommending securities that are more difficult to evaluate. The results illustrate the importance of the applicable laws, including arbitration as a forum for dispute resolution, as a determinant of the liabilities or potential costs of broker-dealers to provide security recommendations.

Keywords: Broker-Dealers, Investment Advisers, Arbitration, Fiduciary Duty, Suitability, Disclosure

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1. Introduction

Two types of financial intermediaries provide personalized investment advice about securities to investors: broker-dealers and investment advisers. The broker-dealer and investment adviser securities regulatory regimes govern the provision of investment advice to assure its integrity and to protect investors.[1] Regulatory agencies and self-regulatory agencies have the responsibility to examine broker-dealers and investment advisers, investigate potential violations of securities laws, and bring enforcement actions. Investors can also bring claims against a broker-dealer or an investment adviser, though differences exist between the two types of financial intermediaries with respect to the forum for dispute resolution and the types of claims investors can bring (SEC (2011)). For broker-dealers, the rules of self-regulatory organizations (e.g., FINRA Rule 12200) require the arbitration of disputes if requested by the customer or required by a written agreement. As a practical matter, most brokerage customers enter into pre-dispute arbitration agreements at account opening (SEC (2011)).

In this paper, I investigate the liabilities of broker-dealers when providing security recommendations. The primary question of this paper is whether the liabilities of broker-dealers can be greater when the securities they recommend are more difficult to evaluate and investors are therefore at a greater risk of harm. Recent research finds that securities which are more difficult to evaluate are often sold to investors at significant premiums (e.g., Henderson and Pearson (2011), and Hoechle, Ruenzi, Schaub, and Schmid (2015)), and also relates the increase in the number and the opacity of financial products to the incentive of financial intermediaries to maximize information rents (e.g., Carlin and Manso (2011) and Sato (2014)).

Investors can bring claims involving a broad range of securities including stocks; preferred stocks; bonds; options, derivative securities, and other derivatives; and insurance products. I measure the potential difficulty of investors to evaluate a security with security opacity. I classify

[1] A study by the staff of the U.S. Securities and Exchange Commission (SEC) staff on investment advisers and broker-dealers pursuant to Section 913 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 provides an in-depth review of the two regulatory regimes (SEC (2011)). At the federal level firms registered as broker-dealers are subject to the Securities Exchange Act of 1934 (or the "Exchange Act") and the regulations thereunder, and the regulations of self-regulatory organizations including the Financial Industry Regulatory Authority (FINRA); and at the federal level firms registered with the SEC as investment advisers are subject to the Investment Advisers Act of 1940 (or the "Advisers Act") and the regulations thereunder. Broker-dealers and investment advisers also may also be subject to provisions under the Internal Revenue Code (IRC) for Individual Retirement Accounts (IRAs); the Employee Retirement Income Security Act of 1974 (ERISA) for private-sector, employer-sponsored retirement plans such as 401(k) plans; and state regulations. A firm registered as both a broker-dealer and an investment adviser may provide both brokerage and advisory services and can be subject to both regulatory regimes.

the securities that are more difficult to evaluate as "opaque," and the securities that are less difficult to evaluate as "non-opaque." A security is opaque if it is either "complex," and exhibits derivative or state-contingent payoffs or has risk exposures that are otherwise more difficult for investors to evaluate; or unregistered with the SEC or "private," and not accompanied by extensive mandatory public disclosures.[2]

The secondary question of this paper is whether the liabilities of broker-dealers are dependent on the violations investors assert as part of the claim. Investors are not limited in the violations they can assert, and bring claims to FINRA arbitration asserting a broad range of violations including violations of the broker-dealer regulatory regime, violations of the investment adviser regulatory regime, and violations of state law (SEC (2011)). Although all claims filed with FINRA arbitration relate to a firm registered as a broker-dealer, the majority of the claims in the sample relate to a firm registered as both a broker-dealer and an investment adviser. FINRA arbitration is also an equitable forum, and arbitrators have discretion when determining an award.[3] Thus, aspects of the broker-dealer regulatory regime and the investment adviser regulatory regime, as well as other considerations, may be determinants of arbitration outcomes.

The test sample is claims that investors file with FINRA that relate to security recommendations and that result in arbitration awards.[4] Broker-dealers and investors have incentive to directly settle most disputes in order to avoid the uncertainty of an award decision as well as the additional legal fees and other costs from arbitration,[5] and a large percentage of claims that investors file with FINRA result in a direct settlement between the parties.[6] However, either party could find it advantageous to arbitrate instead of directly settle the dispute, and many factors may influence the settle-versus-arbitrate decision.[7] To the extent that the liabilities from arbitration

[2]See Section 2.2 for a full description of the security categories. For simplicity, I will refer to all investment products, including derivatives that are not securities and insurance products, as "securities." I will also refer to publicly offered securities as "public" securities, and privately placed securities as "private" securities.

[3]FINRA training materials direct arbitrators to seek guidance from the parties involved in most instances to determine the applicable securities regulations.

[4]As shorthand, I will refer to the liabilities of broker-dealers from investor claims that result in arbitration awards as "the liabilities of broker-dealers from arbitration" or more simply as "the liabilities of broker-dealers."

[5]Broker-dealers can also incur reputational costs from the public disclosure of disciplinary information. For example, investors can review broker-dealer disciplinary information, including the outcomes of past claims, with the online tool BrokerCheck made available by FINRA. Sokobin and Qureshi (2015) find that BrokerCheck disclosures are informative and can relate to the propensity for investor harm.

[6]FINRA operates the largest forum for dispute resolution in the securities industry. Approximately 20% of the claims that investors file with FINRA result in an award decision. FINRA dispute resolution statistics can be found at https://www.finra.org/arbitration-and-mediation/dispute-resolution-statistics.

[7]One factor that could influence the decision to litigate a claim is the ability of both parties to estimate arbitration

are reflective of similar claims that instead result in settlement, or at least influence the settlement amounts, then the test sample would more broadly reflect the liabilities of broker-dealers from investor claims. The liabilities of broker-dealers from arbitration awards are also not immaterial; in the test sample alone investors claim $6.8 billion in damages and receive $1.3 billion in awards.

I first measure the liabilities of broker dealers from arbitration with investor awards. I find that investor awards are more positive when the securities at issue are opaque. For example, I find that investor awards are 9.6% (51.0% to 41.4%) more likely to be positive (greater than zero) when the claims involve opaque securities than when the claims involve non-opaque securities. I also find that the violations investors assert can be determinants of investor awards, and in particular investor assertions of a fiduciary duty or a suitability violation. For example, relative to when claims involve non-opaque securities, investors are 9.2% to 11.6% more likely to receive a positive award when they assert a fiduciary duty violation and the securities at issue are opaque, and are 11.8% to 13.5% more likely to receive a positive award when they assert a suitability violation and the securities at issue are opaque. I do not find evidence that the more positive awards when the securities at issue are opaque also relate to investor assertions of a disclosure violation.

I also find that investor awards are significantly more positive when claims involve either complex or private securities. However, I find that investor assertions of a fiduciary duty or a suitability violation relate to more positive awards when the securities at issue are complex but not when the securities at issue are private. The insignificance of these assertions on the award decision when the securities at issue are private suggests a difference in the selection of these claims for arbitration, and may reflect the influence of additional regulations that generally limits the sale of private securities to investors that meet certain income or net worth thresholds.[8]

I next measure the liabilities of broker-dealers from arbitration with the length of the

awards. In a model of imperfect but symmetric information, Priest and Klein (1984) predict that disputes are more likely to result in litigation when the outcome of the litigation is more uncertain or difficult to determine; and in a model of asymmetric information, Bebchuk (1984) predicts that the selection of claims for arbitration is dependent on the information environment. Psychological biases, such as overconfidence or the need for validation from an external third-party, is another factor that can influence the settle-versus-litigate decision (e.g., Korobkin and Guthrie (1994)). Lastly, defendants may decide to litigate claims as deterrence against, or to determine their liabilities from, future claims.

[8]Compliance with Regulation D generally limits the sale of private securities to an accredited investor, defined as an individual with an earned income of greater than $200,000 (or $300,000 together with a spouse) in each of the previous two years or with a net worth of over $1 million (either alone or together with a spouse and excluding the value of the person's primary residence). See http://www.investor.gov/news-alerts/investor-bulletins/investor-bulletin-private-placements-under-regulation-d for further explanation of the regulation. Few summary documents describe investor assertions as relating to Regulation D. I am therefore unable to directly test these assertions.

arbitration. The length of arbitration measures the legal fees and other expenses to broker-dealers (and to investors) from arbitrating instead of directly settling a dispute. I find that the arbitrations involving opaque securities are longer than the arbitrations not involving opaque securities, and that the increase in length relates to both complex and private securities. Thus, not only are investor awards more positive when the securities at issue are opaque, but the costs to broker-dealers to arbitrate these claims are greater as well.

The longer arbitrations for claims involving opaque securities also suggests that these claims had more uncertain outcomes and were thus more difficult to directly settle prior to arbitration (e.g., Priest and Klein (1984)). The uncertainty of the claims involving opaque securities, however, could also relate to the ability of the two parties to evaluate the violations investors assert. Assuming claim size relates to investor net worth or income, the investors of large claims are more likely to satisfy the suitability requirements (e.g., investment experience or financial situation and need) or meet the private placement exemptions to receive recommendations for opaque securities than the investors of small claims. As a result, violations may be less apparent, and the outcome of arbitration more uncertain, when the securities at issue are opaque and the size of the claim is large. In additional tests, I partition the sample into large and small claims to further control for the selection of claims for arbitration. In general, I find that the additional liabilities when the securities at issue are opaque, and its relationship to investor assertions of a fiduciary duty or a suitability violation, primarily relate to large claims and not to small claims. This evidence is consistent with broker-dealers having additional liabilities from arbitration from the set of claims that were more uncertain and thus more difficult to directly settle.

The results in this paper demonstrate that security recommendations do not occur in a vacuum; broker-dealers can have additional liabilities when recommending securities that are more difficult to evaluate and investors are therefore at a greater risk of harm.[9] The results in this paper also demonstrate that the additional liabilities of broker-dealers when recommending these securities can also relate to specific violations that investors assert including a fiduciary duty and suitability. To my knowledge, this is the first paper to empirically investigate the effect of a fiduciary duty,

[9] Among other results, I also find that firm effect variables are collectively statistically significant. This suggests differences between firms in the characteristics of the claims that result in arbitration awards. Other researchers including Sokobin and Qureshi (2015), Dimmock, Gerken, and Graham (2015), and Egan, Matvos, and Seru (2016), among other results, find differences between firms in the incidence of potential misconduct.

suitability, and other aspects of the regulatory regimes on the liabilities of broker-dealers to provide security recommendations with respect to a broad range of securities.[10] The regulatory regimes that govern the provision of investment advice is a topic of discussion among federal agencies, the financial services industry, and investor advocacy groups (e.g., SEC (2011) and DoL (2016)). This paper adds to the available evidence by illustrating the importance of the applicable laws, including arbitration as a forum for dispute resolution, as a determinant of the liabilities or potential costs of broker-dealers to provide security recommendations.

This paper also contributes to the literature on the relationship between conflicts of interest and the provision of security recommendations. Carlin and Manso (2011) and Sato (2014) argue that financial intermediaries have incentive to develop and offer securities products to investors that increase the level of information asymmetry. In addition, empirical work by Mitchell, Poterba, Warshawsky, and Brown (1999), Coval, Jurek, and Stafford (2009), Henderson and Pearson (2011), Célérier and Vallée (2014), Hoechle et al. (2015), and Egan (2015) indicates that securities with greater opacity are sold to investors at significant premiums. Although non-opaque securities are less difficult for investors to evaluate, empirical work by Bergstresser, Chalmers, and Tufano (2009), Christoffersen, Evans, and Musto (2013), Mullainathan, Nöth, and Schoar (2012), Chalmers and Reuter (2015), and Hoechle et al. (2015) indicates that conflicts of interest can influence the recommendation of these securities as well.[11] The results in this paper suggest that although financial intermediaries can have conflicts of interest which influence their security recommendations, the liabilities or potential costs of financial intermediaries to recommend securities can increase with the potential level of information asymmetry.

I organize the remainder of the paper as follows: Section 2 provides additional background information and describes the variable specifications, Section 3 describes the sample, Section 4 presents the primary test results using the full sample, Section 5 presents the secondary test results after partitioning the sample into large and small claims, and Section 6 concludes.

[10] Chang, Tang, and Zhang (2015), using information from investor interviews in Hong Kong, find that suitability checks reduce the sale of credit-linked notes.

[11] Additional empirical work using international data also finds evidence of conflicts of interest when financial intermediaries provide security recommendations. For example, Hackethal, Haliassos, and Jappelli (2012) find that advised accounts underperform self-managed accounts and that the underperformance relates to higher trading costs; and Fecht, Hackethal, and Karablut (2013) find that the stocks sold to investors from proprietary holdings underperform.

2. Background and Variable Specification

I collect information from summary documents describing FINRA arbitrations with initial filing dates between 2000 and 2013 and with resolution dates between 2005 and 2013. The summary documents contain information describing the claimants and the respondents; the laws, securities, and services relating to the dispute; the relief amount investors request; the outcome of the arbitration including the award amount; the arbitration fees assessed to both parties; the number of hearings; and the composition of the arbitration panel. The summary documents provide a unique environment to test the potential effect of the applicable laws, including the ability of investors to arbitrate disputes and the violations investors assert, on the liabilities of broker-dealers when providing security recommendations.

I first conduct univariate tests comparing the difference in investor awards when the securities at issue are opaque and when the securities at issue are non-opaque. I then conduct multivariate tests regressing measures of arbitration outcomes, including measures of investor awards and the length of arbitration, on the characteristics of the claim and of the arbitration including the violations investors assert. The following subsections provide a further discussion and description of the information and variables I use to conduct the tests.

2.1 Arbitration Outcomes

I first measure the liabilities of broker-dealers (and of broker-dealers that are also registered as investment advisers) from arbitration with investor awards. The summary documents describe awards with the following categories: compensatory damages, punitive or tertiary damages, pre- and post-arbitration interest, security rescissions, legal fees, general costs, and forum fees.[12] I measure investor awards with *award*, equal to the sum of payments relating to account losses and not to arbitration costs.[13] Investor awards can be negative such as when arbitrators award broker-dealers

[12] The summary documents often describe interest on award amounts as accruing from the date of the award until paid in full. In these instances, I estimate the interest amount as the interest that accrues in one month. This estimate is in accordance with FINRA Rule 12904 which requires the payment of all monetary awards within 30 days of its receipt.

[13] I exclude legal fees, general costs, and forum fees from the measure of investor awards. Investors often receive compensation for arbitration fees in simplified arbitrations. For the simplified arbitrations in the sample, investors receive only compensation for arbitration fees for approximately one-third of the claims. Simplified arbitrations, or "small claims" cases, are decided by a single arbitrator and do not involve hearings unless requested by the claimant. Information describing the legal fees of the claimants and respondents is also unavailable. I am therefore not able to fully measure the total costs of arbitration for either party. In another specification, I measure *award* as the sum of all categories of awards. The results remain primarily the same.

compensatory damages. I specify two variables to describe investor awards. The first variable, $+award$, is an indicator variable equal to 1 if *award* is greater than zero, and 0 otherwise; and the second variable, $\%award$, is equal to the ratio of *award* to the relief amount investors claim (*relief*).[14] Although investors may overstate the amount of damages in order to induce a settlement or to sway arbitrators, *relief* is informative assuming it correlates positively with the actual loss. In equation form, the two measures can be written as

$$+award = \mathbf{1}(award > 0)$$

$$\%award = \frac{award}{relief}$$

where $\mathbf{1}(\cdot)$ represents the indicator function.

I also measure the liabilities of broker-dealers from arbitration with the length of arbitration. I measure the length of arbitration with the total number of hearing sessions ($\#hearings$).[15] The number of hearings serves as a proxy for the legal fees and other expenses to obtain a resolution through an arbitration award. The number of hearings also provides an indication of the difficulty of the arbitrators to determine an award, and therefore serves as a proxy for the ability of the parties to directly settle the dispute.[16] Priest and Klein (1984), in a model of symmetric information, argue that disputes are more likely to result in a verdict (or in this case an arbitration award) when the parties are less able to agree on its outcome. As a proxy for the ability of the parties to directly settle the dispute, the number of hearings also represents the ability of broker-dealers to avoid the risk of uncertain award decisions.

[14] The summary documents describe the amount that investors claim with the same categories as the awards (i.e., compensatory damages, punitive or tertiary damages, pre- and post-arbitration interest, etc.). Similar to *award*, I measure *relief* as the sum of payments relating to account losses. The summary documents often describe claimants requesting pre-arbitration interest, interest from the date of investment, or interest at the legal rate. However, the summary documents often do not provide enough information to calculate an estimate. If not enough information is given, then I specify its value as $0.00.

[15] I will refer to the total number of arbitration hearing sessions as the "number of hearings."

[16] Choi, Fisch, and Pritchard (2014) use the number of hearings as a control for arbitration complexity in regressions describing proportional award amounts. These authors use a sample of 417 National Association of Securities Dealers (or NASD, now FINRA) arbitration awards from 1998 to 2000. Similar to this paper, they control for investor assertions of regulatory violations. However, they do not control for the securities at issue and the differential relationships between the proportional award amounts and the violations investors assert dependent on the securities at issue. The focus of their paper is instead on the potential influence of arbitrator backgrounds or securities experience on investor awards.

In the multivariate regressions, I use the variables *relief*, *%award*, and *#hearings* as explanatory variables. In the regressions describing investor awards, I use the number of hearings to control for the difficulty of the parties to directly settle the claim and ultimately its selection for arbitration, and I use the relief amount investors claim to control for the size of the claim. In the regressions describing the number of hearing sessions, I use the relief amount investors claim to control for the size of the claim, and I use the proportional award amount to control for the outcome of the arbitration.

2.2 Securities at Issue

I test for differences in the liabilities of broker-dealers dependent on the opacity of the securities at issue. The summary documents identify the securities at issue with either a general description (e.g., stocks, bonds, mutual funds, etc.) or with a more specific description including the issuer of the security.[17] I use all available information within the summary documents to identify the security, as well as other resources such as the internet and the SECs EDGAR system. The identification of securities is dependent on the amount of information that the summary documents provide. The summary documents do not describe the dollar amount or the percentage each security represents as part of the claim. To make the observations comparable, I classify the securities at issue into categories and measure the opacity of the securities at issue based on these categories.

I first classify securities as either opaque or non-opaque. A security is opaque if it is either a complex security and exhibits derivative or option-like state-contingent payoffs or has risk exposures that are otherwise more difficult for investors to evaluate such as non-traded public REITs; or if it is a private security and not accompanied by extensive mandatory public disclosures. The additional difficulty to evaluate opaque securities, relative to non-opaque securities, increases the potential level of information asymmetry between financial intermediaries and their customers or clients when providing security recommendations. The categories for opaque securities and non-opaque securities are the following:

- opaque security categories - (a) private stock and private preferred stock; (b) private bonds, public and private convertible bonds, and auction rate securities; (c) options, structured

[17] For example, the summary documents can list the securities more generally as "unspecified technology and telecommunications equities," or more specifically as "shares of Automatic Data Processing, Compaq Computer, Enron, Lucent Technologies, and MCI Worldcom."

products, securitizations, and other derivatives; (d) private funds including hedge funds and private equity funds; (e) non-traded or private REITs and tenants-in-common agreements; (f) variable insurance products; and (g) unspecified private securities

- non-opaque security categories - (a) public stock, (b) public preferred stock, (c) public bonds, (d) mutual funds and unit investment trusts, (e) market traded REITs, and (f) fixed insurance products

I further classify opaque securities as complex securities and private securities. I identify complex securities and private securities to control for differences in the determinants of the potential information asymmetry between the broker-dealers and their customers as well as the characteristics of the customers that bring claims. The categories for complex securities and private securities are not mutually exclusive; a complex security can be a private security and a private security can be a complex security. The categories for the opaque securities that are a complex and the opaque securities that are private are the following:

- complex security categories - (a) private preferred stock; (b) public and private convertible bonds, and auction rate securities; (c) options, structured products, securitizations, and other derivatives; (d) private funds including hedge funds and private equity funds; (e) non-traded or private REITs and tenants-in-common agreements; and (f) variable insurance products[18]

- private security categories - (a) private stock and private preferred stock; (b) private bonds and private convertible bonds; (c) private options; (d) private funds including hedge funds and private equity funds; (e) private REITs and tenants-in-common agreements; (f) unspecified private securities

I first measure the opacity of the securities at issue with an indicator variable (*opaque*) equal to 1 if the claim involves at least one opaque security category, and 0 otherwise. I also

[18] I classify private preferred stock as complex because of its dual debt and equity features and the absence of a market price, and I classify private funds as complex because of the alternative investment strategies that may be difficult for investors to evaluate.

measure the opacity of the securities at issue with the proportion of security categories relating to opaque securities (%*opaque*). The variable %*opaque* is equal to the number of opaque security categories (#*opaque*) divided by the total number of opaque security categories and non-opaque security categories (#*non-opaque*). In equation form, %*opaque* can be written as

$$\%opaque = \frac{\#opaque}{\#opaque + \#non\text{-}opaque}$$

I also use #*opaque* and #*non-opaque* in the regressions describing the number of hearings to control for the securities at issue.

I also measure the opacity of the securities at issue as it relates to complex securities and as it relates to private securities. The variables include two indicator variables (*complex* and *private*) identifying the claims involving at least one complex security category or at least one private security category, and two variables (%*complex* and %*private*) measuring the proportion of security categories relating to complex securities or to private securities. The variables %*complex* and %*private* are equal to the number of complex security categories (#*complex*) or the number of private security categories (#*private*) divided by the total number of opaque and non-opaque security categories. In equation form, %*complex* and %*private* can be written as

$$\%complex = \frac{\#complex}{\#opaque + \#non\text{-}opaque}$$

$$\%private = \frac{\#private}{\#opaque + \#non\text{-}opaque}$$

I also use #*complex*, #*private*, and #*non-opaque* in the regressions describing the number of hearings to control for the securities at issue.

The summary documents often refer to the securities at issue as "unspecified securities" or do not provide enough information to identify the security type. I identify these references with an indicator variable (*unspecified*) equal to 1 if the summary documents include a reference to an unspecified security, and 0 otherwise.

2.3 Violations and Other Assertions

I describe the characteristics of the claim with the violations investors assert. The summary documents describe the violations investors assert as either a specific or general reference to FINRA and SEC rules and regulations, general or specific obligations under state law, or a general reference to obligations applicable to broker-dealers and investment advisers under a variety of federal or state law.[19]

Important differences exist between the broker-dealer and investment adviser regulatory regimes (SEC (2011)). For example, the SEC and courts treat investment advisers as owing a fiduciary duty, enforced under the Advisers Act sections 206(1) and (2), to serve in the best interests of their clients, and at a minimum not to subordinate the clients' interests to their own and to disclose or eliminate all material conflicts of interest (SEC (2011)). By contrast, broker-dealers are generally regulated under anti-fraud provisions and rules relating to just and equitable principles of trade and high standards of commercial honor, and are required to deal fairly with their customers (SEC (2011)). Importantly, a broker-dealer cannot satisfy core minimum business conduct requirements, including suitability requirements, to retail investors through disclosure. Broker-dealers are generally not considered to owe fiduciary obligations under the federal securities laws when providing securities recommendations, although they are treated as owing fiduciary duties to customers under some circumstances.[20]

I identify the violations investors assert by their general category in order to compare claims. The categories include: a fiduciary duty (*fiduciary*); the provision of investment advice which is suitable given the investors financial situation and investment objective (*suitable*); disclosure requirements (*disclose*); fraud, misrepresentation, and SEC Rule 10b-5 (*fraud*); communications based on the principles of good faith or fair dealing (*fair*); supervision for compliance with applicable securities laws and regulations (*supervise*); negligence (*neglect*); elder abuse (*elder*); and general reference to federal laws, industry rules, or state laws (*fed-state*). Among the regulations that could specifically relate to the recommendation of securities include a fiduciary duty, suitabil-

[19] For example, the summary documents can list the securities regulations more specifically as "breach of a fiduciary duty, FINRA rule 2111, and FINRA rule 3110," or more generally as "breach of a fiduciary duty, unsuitability, and a failure to supervise."

[20] For example, courts have held that broker-dealers owe their customers a fiduciary duty when they exercise discretion or control over customer assets or have a relationship of trust and confidence (SEC (2011)). In addition, under state law, broker-dealers may be subject to obligations similar to a fiduciary duty (SEC (2011)). ERISA and the IRC also assign fiduciary status to persons providing advice to private-sector employer-sponsored retirement plan investments and to IRA investments (DoL (2016)).

ity, and disclosure. I identify each category with an indicator variable equal to 1 if investors assert its violation, and 0 otherwise. I also identify the applicable state law relating to the dispute with state-level fixed effects. Differences in state law, which can be applied by arbitrators, can influence the arbitration outcome.

The summary documents also describe other investor assertions relating to the recommendation of securities and to the provision of other services. The other assertions include inappropriate risk exposures or a failure to diversify (*risk*), margin trading (*margin*), unauthorized transactions (*unauthorized*), portfolio churning (*churn*), a failure to execute or transfer assets (*transact*), tax advice (*tax*), and the charging of high or improper fees (*fees*). I measure these assertions with an additional set of indicator variables. Security churning is a suitability violation. I separately control for investor assertions of churning, however, because it relates to an improper activity that does not necessarily relate to the recommendation of one particular security over another.

Although arbitrators may be required to write an explanation describing their decision under FINRA Rule 12904, arbitrators typically do not. In addition, few summary documents include an explanation of the award decision. Thus, although I am able to control for the violations investors assert and test whether these assertions relate to investor awards, I am not able to also test for whether the violations investors assert were in actual violation.

2.4 Claimants, Respondents, and Arbitrators

I also describe the characteristics of the claim with the parties and other characteristics of the arbitration. The summary documents provide information describing the investors and the financial intermediaries that are parties to the dispute. I first control for the number of investors (*#investors*), generally retail investors, that are claimants to the dispute. I measure *#investors* as the number of investors that are party to the dispute and likely responsible for investment decisions.[21] I also control for the number of firms (*#firms*) that are respondents to the dispute. The number of investors and the number of firms controls for the size of the claim relating to the amount of advice given and the number of entities that are potentially liable.

The liabilities of broker-dealers from the set of claims that result in arbitration awards can be firm specific and dependent on their policies and procedures. I control for firm specific effects with

[21] The summary documents often list minors or other beneficiaries as claimants. These persons were unlikely to be responsible for the investment decisions.

firm effect variables. I specify firm effect variables for a firm or a set of firms that are respondents to five or more claims in the sample. These firms are likely to be repeat players whose policies and procedures could influence the selection of disputes for arbitration (Drahozal and Zyontz (2010)).[22] Each firm effect variable is equal to 1 if the firm or the set of firms are respondents to the claim, and 0 otherwise. I also identify repeat claims in the sample with repeat-claim effect variables. Separate claims, often relating to SEC enforcement actions, can be identical. Examples include claims against Salomon Smith Barney analyst Jack B. Grubman for improper issuance of telecom sector research reports, Regions Morgan Keegan for failure to properly value subprime mortgage securities, and the Charles Schwab YieldPlus Fund for deviation from investment policies.[23] Each repeat-claim effect variable is equal to 1 if the claim relates to a particular claim, and 0 otherwise.

The summary documents also provide information describing the arbitrators that decide the arbitration. Arbitrators can either have a non-public or public classification. Non-public arbitrators have no prior association with the business activities of a broker or a dealer, whereas public arbitrators have a prior association. Panels of three arbitrators have traditionally been comprised of two public arbitrators and one non-public arbitrator. Past research indicates that the composition of the panel can be a predictor of arbitration awards. For example, Choi et al. (2014) find that the background or securities experience of arbitrators can be significant determinants of award decisions. In January 2011, FINRA gave claimants the option to have their claim decided by a panel consisting of three public arbitrators.[24] I measure the composition of arbitrators with the proportion of the arbitrators that do not have an affiliation with the brokerage industry (*%public*) and with the number of arbitrators (*#arbitrators*). Claims with dispute amounts less than $25,000 before January 2011 or $50,000 thereafter are generally brought to a panel of one public arbitrator and do not involve hearings unless requested by the claimant. I identify "simplified" arbitrations with an indicator variable (*simplified*).

3. Sample and Description of Arbitration Outcomes and Claims

[22] I identify 76 sets of firms that are respondents to five or more claims in the sample, representing 73.6% of the total number of observations. Among the other sets of firms, 678 are respondents to four claims or less with 523 respondents to only one claim.

[23] I identify 7 different repeat claims representing 13.7% of the sample. The results are similar if I exclude these claims from the test sample.

[24] Among the non-simplified arbitrations in the sample, 77 were decided by all-public three-arbitrator panels with 33 of the arbitrations having resolution dates in 2012 and 44 of the arbitrations having resolution dates in 2013.

3.1 Sample

I utilize information from summary documents relating to customer arbitrations against a firm or associated person of a firm with initial filing dates between 2000 and 2013 and with resolution dates between 2005 and 2013.[25] The initial sample includes 7,872 observations with full information describing the compensatory claim amount, the initial filing date, the resolution date, the rule violations investors assert, the arbitration fees assessed to investors and to broker-dealers, and the arbitration panel; and relating to arbitrations with hearings held within the United States. I first exclude 2,330 observations that relate to full or partial settlements. Summary documents generally do not describe settlement amounts, and I am therefore unable to measure the total amount of compensation.[26] Similarly, I exclude 536 observations that relate to claims that were fully or partially withdrawn, filed after the statute of limitations had expired, or identified respondents that were not subject to FINRA arbitration. Arbitrators typically do not decide an award in these instances, and I am therefore not able to relate the entirety of the claim to the award decision.

The focus of this paper is on the recommendation of securities and not on other financial services such as the execution of transactions, the transfer of assets between accounts, and tax advice. I therefore exclude 1,167 observations that either do not relate to security recommendations or with not enough information to identify at least one of the securities at issue. I also exclude 370 observations that relate to other assertions including the charging of exorbitant or improper fees and criminal activity such as forgery or theft. There are 3,469 observations in the final sample.

3.2 Description of Arbitration Outcomes and Claims

Table 1 summarizes the amount that investors request as relief, the arbitration awards, and the number of hearings. Panel A summarizes the compensatory damages and the total amount that investors request as relief. The median compensatory damages that investors request is $138,000,

[25] Arbitration awards can be found at http://www.finra.org/arbitration-and-mediation/arbitration-awards-online. I do not utilize information from disputes that involve more than five respondent firms or that involve cross-claimants or third-party respondents; the additional parties increase the complexity of the dispute and decrease the informativeness of the arbitration award.

[26] In addition, approximately 84% of the full and partial settlements in the sample result in recommendations by the arbitration panel for expungement of the arbitration from the industry records. Broker-dealers will typically seek an expungement of the arbitration when claims are "factually impossible or clearly erroneous," such as when they are improperly identified as respondents, or when claims are "false," such as when they did not commit a violation. Thus, the sample of claims that I observe resulting in full settlements would not be representative of all claims that result in a full settlement, and would not be an appropriate comparison group to the set of claims that result in arbitration awards.

with an interquartile that ranges from $25,000 to $483,000; and the median total relief that investors request (which includes punitive damages and interest) is $174,000, with an interquartile that ranges from $27,000 to $586,000. The total amount of relief that investors request for the claims in the sample is $6.8 billion. I classify claims with requests of compensatory damages greater than or equal to the sample median ($138,000) as large claims, and claims with requests of compensatory damages strictly less than the sample median as small claims.

Panel B summarizes the proportion of disputes that result in an investor award strictly greater than zero (or a positive award), equal to zero (or no award), and strictly less than zero (or a negative award). Investors receive positive awards for 43.5% of all claims in the sample, and negative awards for 0.8% of all claims in the sample. Large claims are 8.6% more likely than small claims to receive a positive award. Panel C summarizes the award amount for claims that result in a positive arbitration award. The median investor award for all claims that result in a positive amount is $62,000, with an interquartile that ranges between $20,000 and $201,000. The median arbitration award for large claims that result in a positive amount is $168,000 with an interquartile that ranges between $73,000 and $383,000, and the median arbitration award for small claims that result in a positive amount is $20,000 with an interquartile that ranges between $8,000 and $43,000. The total award amount in the sample is $1.3 billion, or 18.9% of the total amount investors request as relief.

Panel D summarizes the number of hearings after excluding simplified arbitrations from the sample. The median number of hearings for all non-simplified arbitrations is 7 with an interquartile range from 4 to 10. The length of non-simplified arbitrations is longer for large claims, with a median of 8 hearings, than for small claims, with a median of 4 hearings. In unreported estimates, the median number of months from the initial file date to the resolution date for all arbitrations (including simplified arbitrations) is 14 months, and the median number of months from the initial file date to the resolution date for non-simplified arbitrations is 15 months. As a comparison, the median number of months from filing to disposition for civil cases in U.S. district courts is approximately 25 months.[27]

Table 2 presents the averages of the variables measuring the opacity of the securities at issue (*opaque*, *complex*, and *private*; and %*opaque*, %*complex*, and %*private*). Panel A presents

[27] http://www.wsj.com/articles/in-federal-courts-civil-cases-pile-up-1428343746

the time-series averages, and Panel B presents the averages for the full sample and for large and small claims. In general, the proportion of claims involving at least one opaque security (or at least one complex security or private security) increases over the sample period. This evidence is consistent with the predictions of Carlin and Manso (2011) and other empirical evidence suggesting an increase in the availability of opaque securities (e.g., Célérier and Vallée (2014)).[28] For the full sample, 21.7% of the claims involve at least one opaque security, with 20.2% of the claims involving at least one complex security and 4.9% involving at least one private security. Large claims are 12.1% more likely than small claims to involve at least one opaque security, and are 11.3% more likely to involve at least one complex security and 5.8% more likely to involve at least one private security. I find similar patterns with respect to the proportion of the security categories at issue that are opaque, and with respect to the proportion of the security categories that are complex or that are private.

Table 3 presents the proportion of claims relating to the violations investors assert and to other investor assertions. Panel A presents the proportion of claims relating to the violations investors assert, and Panel B presents the proportion of claims relating to other investor assertions. A violation of a fiduciary duty is the most common investor assertion, and relates to 75.7% of all claims. An assertion of a suitability violation applies to 50.9% of all claims, and an assertion of a disclosure violation applies to 33.2% of all claims. Other frequently asserted violations include fraud (71.6%), supervision (51.3%), and negligence (64.6%). Large claims are more likely to assert a particular violation than small claims. The exception is assertions of disclosure violations which are 5.5% more likely to be asserted among small claims. Large claims are also 13.8% more likely to assert improper risk exposures or over-concentration of positions as part of the dispute, and are also 4.8% more likely to relate to margin trading. In unreported estimates, I find little difference in investor assertions between claims with at least one opaque security and claims without any opaque securities. For example, assertions of a fiduciary duty violation are similar between claims with at least one opaque security (74.0%) and claims without any opaque securities (76.2%). Assertions of

[28] The increase in opaque securities is primarily the result of an increase in claims that relate to derivatives, from 4.8% in 2005 to 10.1% in 2013; private funds, from 0.5% in 2005 to 5.9% in 2013; and non-traded or privately placed REITs or tenants-in-common investments, from 0.1% in 2005 to 7.7% in 2013. Alternatively, the proportion of claims that relate to non-opaque securities, and in particular public equity, decreased over the same period. The proportion of claims that relate to public equity decreased from 70.0% in 2005 to 29.5% in 2013. Mutual funds and unit investment trusts comprise 36.4% of the full sample, with some fluctuation between years.

a suitability violation (53.7% to 50.1%) and assertions of a disclosure violation (29.9% to 34.1%) are also similar between the two sets of claims.

Table 4 presents information describing the size of the parties to the arbitration. Panel A presents information describing the number of investors, and Panel B presents information describing the number of firms. Among all claims in the sample, 63.8% of the claims involve one investor and 30.2% of the claims in the sample involve two investors. In addition, among all claims in the sample 92.7% involve one firm and 6.0% involve two firms. Large claims are more likely to involve a greater number of investors and firms than small claims.

4. Tests of Arbitration Outcomes

The primary question of this paper is whether the liabilities of broker-dealers can be greater when the securities they recommend are more difficult to evaluate and investors are therefore at a greater risk of harm. The secondary question of this paper is whether the liabilities of broker-dealers are dependent on the violations investors assert as part of the claim. I address these questions by testing for differences in investor awards dependent on the securities at issue, and by testing for the significance of the potential determinants of arbitration outcomes. I also investigate the influence of other characteristics of the claim and of the arbitration.

4.1 Tests of Arbitration Awards

I begin the empirical analysis by conducting univariate tests for differences in $+award$ (an indicator variable equal to 1 if the investor receives an award greater than 0, and 0 otherwise) and $\%award$ (the proportion of the award amount to the relief amount) between claims that involve at least one opaque security ($opaque = 1$) and claims that involve no opaque securities ($opaque = 0$). I also conduct univariate tests for differences in awards between claims that involve at least one complex security ($complex = 1$) and claims that involve no complex securities ($complex = 0$), and for differences in awards between claims that involve at least one private security ($private = 1$) and claims that involve no private security ($private = 0$). I test for differences in $+award$ with a two sample test for proportions, and I test for differences in $\%award$ with a Wilcoxon rank-sum test. I use a Wilcoxon rank-sum to test for differences in $\%award$ due to the non-normality of its distribution as a result of the large number of awards equal to zero and of the presence of extreme

outliers.

Table 5 presents the results. Panel A presents univariate tests of $+award$, and Panel B presents univariate tests of $\%award$. I find that the proportion of claims that result in a positive investor award is higher for claims involving at least one opaque security (51.0%) than for claims involving no opaque securities (41.4%), and that this difference is statistically significant at the 99% confidence level with a z-statistic equal to 4.69. I also find that this significant difference relates to both complex securities and private securities; disputes involving complex securities are 9.7% more likely to result in a positive investor award, and disputes involving private securities are 14.9% more likely to result in a positive award. Similarly, I find that the distribution of $\%award$ is more positive for claims involving at least one opaque security than for claims involving no opaque securities, and that the difference in distributions is statistically significant at the 99% confidence level. I again find that this significant difference relates to both complex securities and to private securities. Overall, these results indicate that investor awards from arbitration are more positive when the securities at issue are opaque, and investors are therefore more susceptible to harm.

I next estimate multivariate ordinary least squares regressions describing $+award$ and $\%award$. I use as explanatory variables measures describing the opacity of the securities at issue, the violations and other assertions made by investors as part of their claim, and the parties to the arbitration including the composition of the arbitration panel. I also include the amount that investors request for relief to control for the size of the claim, and the number of hearings prior to an award decision to control for the difficulty of the parties to directly settle the dispute and its selection for arbitration. I also include interaction terms between the variables describing the opacity of the securities at issue and the variables that control for investor assertions of fiduciary duty violations, suitability violations, and disclosure violations. The interaction terms measure the additional liability of broker-dealers when the securities at issue are opaque (relative to when the securities at issue are non-opaque) and investors assert a particular violation.

I use an ordinary least squares regression instead of another model, such as a probit or logit model, to estimate $+award$ to avoid an incidental parameters problem from the inclusion of firm effect variables and state fixed-effect variables (Greene (2003)).[29] The linear probability model

[29] I also estimate the parameters in regressions describing $+award$ with a probit model. The regression results remain primarily the same.

does consistently estimate regression parameters (Wooldridge (2010)), and few predicted values from this specification are either less than zero or greater than one. I winsorize $\%award$ at the 0.5^{th} and 99.5^{th} percentile to reduce the influence of extreme values on parameter estimates.[30] In equation form, I estimate the following regressions

$$\begin{aligned} y \;=\; & \boldsymbol{\beta} \times \boldsymbol{sectype} + \gamma_1 \times \mathit{fiduciary} + \boldsymbol{\delta}_1 \times \boldsymbol{sectype} \times \mathit{fiduciary} + \\ & \gamma_2 \times \mathit{suitable} + \boldsymbol{\delta}_2 \times \boldsymbol{sectype} \times \mathit{suitable} + \\ & \gamma_3 \times \mathit{disclose} + \boldsymbol{\delta}_3 \times \boldsymbol{sectype} \times \mathit{disclose} + \boldsymbol{\eta} \times \boldsymbol{x} + \alpha + \varepsilon \end{aligned} \tag{1}$$

where y represents either $+award$ or $\%award$; $\boldsymbol{sectype}$ represents *opaque* (or *complex* and *private*) or $\%opaque$ (or $\%complex$ and $\%private$); $\boldsymbol{x}$ represents all other explanatory variables; $\boldsymbol{\beta}$, γ, $\boldsymbol{\delta}$, and $\boldsymbol{\eta}$ represent model parameters; α represents the intercept term; and ε represents the error term. In all regressions, I calculate t-statistics with clustered standard errors at the firm and year level.

Table 6 presents the regression results when I control for the securities at issue with *opaque* or $\%opaque$. The first and second columns present estimates of the linear probability models describing $+award$, and the third and fourth columns of the table present estimates of the ordinary least squares models describing $\%award$. The interaction terms indicate more positive investor awards when claims involve opaque securities and investors assert a fiduciary duty or a suitability violation. Specifically, relative to when the securities at issue are non-opaque ($opaque = 0$ or $\%opaque = 0$), the likelihood of a positive investor award increases by 9.2% to 11.6% when the securities at issue are opaque ($opaque = 1$ or $\%opaque = 1$) and investors assert a fiduciary duty violation ($fiduciary = 1$), and increases by 11.8% to 13.5% when the securities at issue are opaque and investors assert a suitability violation ($suitable = 1$). These results indicate that the violations investors assert can increase the liabilities of broker-dealers when providing security recommendations, and in particular when investors are at a greater risk of harm. The regressions describing $\%award$ also indicate relatively more positive awards when the securities at issue are opaque and investors assert a fiduciary duty or a suitability violation. The relative increase in $\%award$ when

[30] I also winsorize the relief amount investors claim, the number of hearings, and the number of claimants at the 99.5^{th} percentile.

investors assert these violations, however, is insignificant. Lastly, although in all regressions I find that investor assertions of disclosure violations relate to less positive investor awards, I find no significant difference when the securities at issue are opaque than when the securities at issue are non-opaque. One explanation is that disputes relating to actual disclosure violations are easily discernible and therefore more likely to result in a direct settlement between the parties and less likely to result in arbitration.

Among the other explanatory variables, I find that the number of hearings is also positive and significant in explaining arbitration awards. This suggests that among the claims that result in an arbitration award decision, the claims that require additional time for arbitrators to evaluate are the claims with the more positive investor awards. Consistent with Choi et al. (2014), I also find evidence that the proportion of public arbitrators (or arbitrators with no association with the brokerage industry) positively relates to both the likelihood of a positive award and to the proportional award amount. However, the proportion of public arbitrators is only significant in the regressions modeling the likelihood of a positive award. Lastly, in unreported tests I find that both firm and repeat-claim effect variables are collectively significant at the 99% confidence level. The collective significance of both sets of variables indicates that firm specific differences influence the selection of claims that result in arbitration and its outcome.

Table 7 presents the regression results when I control for the securities at issue with *complex* and *private* or %*complex* and %*private*. I find that investor awards are significantly more positive when the securities at issue are complex and investors assert a fiduciary duty or a suitability violation; all eight interaction terms are positive, and six of the eight interaction terms are significant at the 95% confidence level or greater. The interaction terms relating to private securities and to investor assertions of a fiduciary duty or a suitability violation, however, are statistically insignificant. The difference in significance between the two sets of interaction terms suggests the influence of other factors on the advice that broker-dealers provide and the claims that result in arbitration. For example, Regulation D generally limits the sale of private securities to investors that meet certain income or net worth thresholds.[31] I again find that investor assertions of disclosure violations negatively relate to investor awards, and that the relationship is not dependent on opaque security

[31] See footnote 8 for further discussion of Regulation D. Few summary documents describe investor assertions as relating to Regulation D. I am therefore unable to directly test for this assertion.

type.

4.2 Tests of Arbitration Length

I continue the empirical analysis by estimating multivariate regressions describing the number of hearings prior to an award decision (*#hearings*). I include only non-simplified arbitrations in the regression sample. Similar to the regressions describing arbitration awards, I use as explanatory variables measures describing the opacity of the securities at issue, the violations and other assertions made by investors as part of their claim, and the parties to the arbitration including the composition of the arbitration panel. In general, the explanatory variables are the same as the regressions describing the award amount. However, I use the number of security categories, *#opaque* and *#non-opaque* (or *#complex*, *#private*, and *#non-opaque*), to control for the securities at issue.[32]

I also include the relief amount that investors request and the proportional award amount to control for the size of the claim and its outcome. I estimate the rate at which arbitrators decide an award with a semi-parametric Cox proportional hazards model. I winsorize *#hearings* at the 99.5th percentile to reduce the influence of outliers on parameter estimates. In equation form, I estimate the following regressions

$$y \quad = \quad \boldsymbol{\beta} \times \boldsymbol{sectype} + \gamma_1 \times \mathit{fiduciary} + \gamma_2 \times \mathit{suitable} + \gamma_3 \times \mathit{disclose} + \boldsymbol{\eta} \times \boldsymbol{x} + \varepsilon \qquad (2)$$

where y represents *#hearings*; ***sectype*** represents *#opaque* (or *#complex* and *#private*) and *#non-opaque*; $\boldsymbol{x}$ represents all other explanatory variables; $\boldsymbol{\beta}$, γ, and $\boldsymbol{\eta}$ represent model parameters; and ε represents the error term. In all regressions, I calculate t-statistics with clustered standard errors at the firm and year level.

Table 8 presents the results. The table presents the results with coefficient estimates in the form of hazard ratios. A hazard ratio describes the rate at which arbitrators are able to determine

[32] Similar to Equation (1), an alternative specification would be to include interactions terms between the variables controlling for the securities at issue (e.g., *#opaque* and *#non-opaque*) and the variables controlling for the violations investors assert (i.e., *fiduciary*, *suitable*, *disclose*). However, it is unclear whether the relationship between the securities at issue and the number of hearings would be dependent on investor assertions of violations. Thus, I do not include interaction terms in this specification.

an award for a one-unit increase in the explanatory variable; a hazard ratio less than 1.0 indicates a one-minus-hazard-ratio decrease in the rate arbitrators are able to determine an award, and a hazard ratio greater than 1.0 indicates a hazard-ratio-minus-one increase in the rate arbitrators are able to determine an award. An additional security category relating to a claim significantly decreases the rate at which arbitrators are able to decide awards. However, an additional opaque security category decreases the rate at which panels decide awards by 17.6% whereas an additional non-opaque security category decreases the rate at which panels decide awards by only 5.7%. The longer arbitrations for claims involving opaque securities indicate that these claims are more costly to arbitrate than claims involving non-opaque securities.[33]

Seven of the nine variables controlling for the violations investors assert decrease the rate at which panels decide awards, and five of those seven (fiduciary duty; fraud; supervision; general federal, industry, or state rules; and good faith or fair dealing) are statistically significant at the 95% confidence level or greater in both regressions. The significance of investor assertions of a fiduciary duty violation is consistent with broker-dealers arguing against the application of a fiduciary duty as part of the determination of the award. Both hazard ratios relating to investor assertions of suitability violations and to investor assertions of disclosure violations are greater than 1.0, indicating that these assertions do not increase the length of arbitrations.

Among the other variables that are significant in predicting a greater number of hearings include the amount of relief that investors request, the number of investors, and the proportional award amount. Thus, larger claims and claims that result in more positive awards relate to longer arbitrations. Lastly, similar to regressions describing investor awards, in unreported tests I find that firm and repeat-claim effect variables are collectively significant at the 99% confidence level. These results again indicate that firm specific differences influence the selection of claims that result in arbitration and its outcome.

5. Tests of Arbitration Outcomes with Large and Small Claims

The results above indicate that broker-dealers can have additional liabilities from arbitration when recommending opaque securities including more positive investor awards and a greater cost

[33] In unreported estimates and consistent with the additional number of hearings prior to an award decision, I also find that the average broker-dealer forum fees for non-simplified arbitrations is significantly greater when claims involve at least one opaque security ($13,853) than when claims involve no opaque securities ($10,462).

to arbitrate the claim. The longer arbitrations for claims involving opaque securities also suggest that these claims were more difficult for arbitrators to evaluate, or had more uncertain outcomes, and were therefore more difficult for the parties to directly settle prior to arbitration. Although the presence of opaque securities could increase the uncertainty of the award decision and therefore decrease the ability of the parties to directly settle the dispute, the effect of opaque securities on the uncertainty of the award decision could also depend on investor characteristics and the ability of broker-dealers to evaluate the violations investors assert as part of the claim.

Claims may be less difficult to evaluate when the securities at issue are opaque and investors have fewer investments; investors with lower income or net worth may be less likely to satisfy the requirements or exemptions to receive recommendations for opaque securities. Assuming that claim size positively relates to investor income or net worth, the uncertainty of the arbitration award when the securities at issue are opaque could increase with claim size. Large claims that relate to the recommendation of opaque securities, therefore, may be more difficult to directly settle and thus more likely to result in arbitration than similar small claims. In this section, I repeat the empirical analysis above but separately for large and small claims to control for differences in the settle-versus-arbitrate decision (and the selection of claims that result in arbitration) that could be dependent on claim size.

5.1 Tests of Arbitration Awards

Similar to before, I first conduct univariate tests for sample differences in $+award$ and $\%award$ between claims that involve at least one opaque security and claims that involve no opaque securities. I also conduct univariate tests for sample differences between claims that involve at least one complex security and claims that involve no complex securities, and for sample differences between claims that involve at least one private security and claims that involve no private securities. Table 9 presents the results. Panel A presents univariate tests of $+award$, and Panel B presents univariate tests of $\%award$. Both panels present univariate test results for large and small claims. I find that the more positive investor awards when at least one of the securities at issue is opaque primarily relates to the sample of large claims. All six univariate tests relating to large claims indicate significantly more positive awards when at least one security is opaque (or complex or private), and five of the six test results are significant at the 99% confidence level. I also find

similar results with univariate tests relating to small claims. The results, however, are generally not as significant. The exception is the more positive awards when small claims involve at least one private security. These more positive awards, however, relate to a small number of claims (35).

I next estimate multivariate regressions describing $+award$ and $\%award$. I use the same regression specifications as before. Table 10 presents the regression results when I control for the securities at issue with *opaque* or $\%opaque$. Panel A presents the regression results for large claims, and Panel B presents the regression results for small claims. For both large and small claims I find that *opaque* and $\%opaque$ are either negatively or insignificantly related to investor awards. Among large claims, however, I find that the more positive awards when the securities at issue are opaque relate to investor assertions of a fiduciary duty or a suitability violation. Specifically, relative to when the securities at issue are non-opaque, the likelihood of a positive investor award for large claims increases by 18.7% to 23.5% when investors assert a fiduciary duty violation ($fiduciary = 1$) and the securities at issue are opaque ($opaque = 1$ or $\%opaque = 1$), and increases by 13.0% to 13.4% when investors assert a suitability violation ($suitable = 1$) and the securities at issue are opaque. Similarly, relative to when the securities at issue are non-opaque, the proportional award amounts ($\%award$) for large claims increases by 14.7% to 16.3% when investors assert a fiduciary duty violation and the securities at issue are opaque, and increases by 8.7% to 9.9% when investors assert a suitability violation and the securities at issue are opaque. All eight of these estimates are statistically significant at the 90% confidence level or greater, and six of the eight are statistically significant at the 95% confidence level or greater. Although I find some evidence among small claims that investor awards are more positive when the securities at issue are opaque (relative to when the securities at issue are non-opaque) and when investors assert a fiduciary duty or a suitability violation, in general the relationships are not as significant. I do find among small claims, however, a more significant negative relationship between investor awards and investor assertions of a disclosure violation.

The differences in results between large and small claims suggest differences in the selection of claims for arbitration that is dependent on claim size. In particular, the additional liabilities of broker-dealers when the securities at issue are opaque among large claims suggests that broker-dealers were less able to resolve these claims through settlement prior to arbitration. The significance of investor assertions of a fiduciary duty or a suitability violation among large claims

also suggests its importance when claims are more likely to result in arbitration due to the uncertainty of the award decision and not to other factors, and thus its importance to the liabilities of broker-dealers more generally when providing security recommendations.

Table 11 presents the regression results when I control for the securities at issue with *complex* and *private* or %*complex* and %*private*. Panel A presents regression estimates for large claims, and Panel B presents regression estimates for small claims. I again find that the more positive awards when investors assert a fiduciary duty or a suitability violation and the securities at issues are opaque primarily relate to complex securities and not to private securities. For example, among large claims I again find that the relative more positive investor awards when the securities are opaque and investors assert a fiduciary duty or a suitability violation relates to complex securities and not to private securities; all eight of the interaction terms are positive and statistically significant at the 90% confidence level or greater, and seven of the eight interaction terms are positive and statistically significant at the 95% confidence level or greater. I also find among small claims a more positive relationship when the securities at issue are complex between investor awards and investor assertions of a suitability violation; all four of the interaction terms are positive and statistically significant at the 95% confidence level.

5.2 Tests of Arbitration Length

I continue the empirical analysis by estimating multivariate regressions describing #*hearings*. I again estimate the rate at which arbitrators decide an award with a semi-parametric Cox proportional hazards model using observations relating to non-simplified arbitrations only. The regression specification remains the same as before. Table 12 presents the results. The first and second columns present regression results relating to large claims, and the third and fourth columns present regression results relating to small claims. For large claims, I find that the number of opaque security categories decreases the rate at which arbitrators are able to determine an award, and that both the number of complex security categories and the number of private security categories relate to longer arbitrations. Alternatively, for small claims I do not find that the number of opaque security categories (or complex security categories or private security categories) has a significant effect on the number of hearings. I also find no evidence that the number of non-opaque security categories is significant in describing the number of hearings for large claims and only weak evi-

dence for small claims. Lastly, the influence of the violations investors assert on the length of the arbitration is similar between large and small claims. Similar to the full sample regressions, investor assertions of a fiduciary duty violation relates to longer arbitrations whereas investor assertions of a suitability violation and investor assertions of a disclosure violation do not significantly relate to arbitration length.

These results indicate that the securities at issue were more significant in describing the length of the arbitration, and therefore the cost of arbitrating a claim, for large claims than for small claims. Consistent with the more positive investor awards, the results also suggest that the securities at issue were a more significant factor of the uncertainty of the award decision, and therefore the selection of claims for arbitration, among large claims.

6. Conclusion

The security recommendations made by financial intermediaries do not occur in a vacuum; broker-dealers and investment advisers are regulated extensively to assure the integrity of the advice investors receive and to provide for investor protections. The results of this paper indicate that broker-dealers can have additional liabilities and costs to resolve disputes when they recommend securities that are more difficult to evaluate and investors are therefore at a greater risk of harm. The liabilities and costs relate not only to the arbitration awards and to the additional expense from arbitrating a dispute, but also to the inability of broker-dealers to reduce their risks by directly settling disputes and avoiding the uncertainty of award decisions. Thus, although financial intermediaries have incentives to recommend securities that are more difficult for investors to evaluate (e.g., Carlin and Manso (2011) and Sato (2014)), financial intermediaries can also have additional liabilities or potential costs to recommend these securities. The extent to which the regulatory regimes influence the securities broker-dealers and investment advisers recommend is left for future research.

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Table 1 - Summary Statistics for Variables Measuring Arbitration Outcomes

Panel A - The Relief Amount Investors Request ($000s)

Measure	N	Percentile					Avg.	Total
		1st	25th	50th	75th	99th		
compensatory relief	3,469	2	25	138	483	20,000	1,475	5,120,000
relief (total)	3,469	2	27	174	586	30,600	1,971	6,840,000

Panel B - The Likelihood that Investor Awards are Positive, Zero, or Negative (%s)

Sample	N	*award*		
		> 0	$= 0$	< 0
All Claims	3,469	43.5	55.7	0.8
Large Claims	1,736	47.8	51.1	1.2
Small Claims	1,733	39.2	60.2	0.5

Panel C - Investor Awards (*award*) when *award* > 0 ($000s)

Sample	N	Percentile					Avg.	Total
		1st	25th	50th	75th	99th		
All Claims	1,509	0	20	62	201	9,110	855	1,290,000
Large Claims	829	5	73	168	383	15,200	1,426	1,180,000
Small Claims	680	0	8	20	43	250	159	108,000

Panel D - The Number of Hearings (#*hearings*) when #*hearings* > 0*

Sample	N	Percentile					Avg.	Total
		1st	25th	50th	75th	99th		
All Claims	2,762	1	4	7	10	37	8	22,813
Large Claims	1,726	1	6	8	12	40	10	17,706
Small Claims	1,036	1	3	4	7	17	5	5,107

This table reports summary statistics describing the relief investors request, the investor awards, and the number of hearings prior to an award decision. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. I measure *relief* and *award* with damages relating to investor account losses and not to bringing a claim to arbitration. See Section 2.1 for a full description of the variable specifications. *Except for a small number of arbitrations, the arbitrations without hearings are simplified arbitrations; simplified arbitrations do not involve hearings (#*hearings* $= 0$) unless requested by the claimant.

Table 2 - Sample Averages for Variables Controlling for Securities at Issue

Panel A - Time-Series Averages

Year	N	Average					
		opaque	*complex*	*private*	%*opaque*	%*complex*	%*private*
2005	995	0.131	0.127	0.011	0.095	0.092	0.008
2006	511	0.164	0.157	0.018	0.121	0.115	0.013
2007	311	0.177	0.174	0.013	0.151	0.148	0.011
2008	183	0.235	0.213	0.049	0.186	0.164	0.046
2009	360	0.208	0.192	0.047	0.175	0.159	0.043
2010	405	0.262	0.240	0.059	0.238	0.217	0.054
2011	316	0.335	0.301	0.123	0.299	0.263	0.109
2012	219	0.388	0.356	0.160	0.357	0.322	0.144
2013	169	0.408	0.373	0.130	0.374	0.334	0.123

Panel B - Sample Averages

Sample	N	Average					
		opaque	*complex*	*private*	%*opaque*	%*complex*	%*private*
All Claims	3,469	0.217	0.202	0.049	0.183	0.168	0.043
Large Claims	1,736	0.278	0.259	0.078	0.229	0.209	0.069
Small Claims	1,733	0.156	0.145	0.020	0.136	0.126	0.018

This table presents the averages for the variables controlling for the securities at issue. Panel A presents the time-series sample averages, and Panel B presents the averages for all claims in the sample, and averages separately for large and small claims. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. The variables *opaque*, *complex*, and *private* are indicator variables; and the variables %*opaque*, %*complex*, and %*private* are proportional variables. See Section 2.2 for a description of the security categories and the variable specifications.

Table 3 - Summary of Investor Assertions

Panel A - Investor Assertions of Violations (%s)

Sample	N	Investor Assertions of Violations								
		fiduc.	*suitable*	*disclose*	*fraud*	*superv.*	*neglect*	*fair*	*elder*	*fed-st.*
All Claims	3,469	75.7	50.9	33.2	71.6	51.3	64.6	12.5	2.0	34.1
Large Claims	1,736	86.2	58.1	30.5	78.6	62.7	78.6	15.5	3.0	44.7
Small Claims	1,733	65.1	43.7	35.9	64.6	40.0	50.6	9.5	1.0	23.4

Panel B - Other Investor Assertions (%s)

Sample	N	Other Investor Assertions						
		risk	*margin*	*unauth.*	*churn*	*transact*	*tax*	*fees*
All Claims	3,469	16.6	6.0	12.0	7.2	2.5	0.9	5.2
Large Claims	1,736	23.4	8.4	11.1	9.2	2.6	1.2	5.2
Small Claims	1,733	9.7	3.6	12.9	5.1	2.4	0.6	5.1

This table describes the percentage of claims relating to investor assertions. Panel A describes the percentage of claims relating to investor assertions of violations, and Panel B describes the percentage of claims relating to other investor assertions. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. See Section 2.3 for a discussion of the applicable laws, the categories of investor assertions, and the variable specifications.

Table 4 - The Numbers of Investors and Firms Per Claim

Panel A - The Number of Investors Per Claim (#*investors*)

Sample	N	= 1		= 2		> 2		Max
		N	%	N	%	N	%	
All Claims	3,469	2,213	63.8	1,046	30.2	210	6.1	44
Large Claims	1,736	967	55.7	593	34.2	176	10.1	44
Small Claims	1,733	1,246	71.9	453	26.1	34	2.0	33

Panel B - The Number of Firms Per Claim (#*firms*)

Sample	N	= 1		= 2		> 2		Max
		N	%	N	%	N	%	
All Claims	3,469	3,215	92.7	208	6.0	46	1.3	5
Large Claims	1,736	1,560	89.9	144	8.3	32	1.8	5
Small Claims	1,733	1,655	95.5	64	3.7	14	0.8	4

This table describes the number of parties to the arbitrations in the sample. Panel A describes the number of claims and the percentage of claims when the number of investors is equal to one, equal to two, greater than two, and the maximum number of investors party to an arbitration in the sample; and Panel B describes the number of claims and the percentage of claims when the number of firms is equal to one, equal to two, greater than two, and the maximum number of firms party to an arbitration in the sample. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. See Section 2.4 for a discussion of the parties to the arbitration and the variable specifications.

Table 5 - Full Sample Univariate Tests of Arbitration Awards

Panel A - Two Sample Test of Proportions (+*award*)

Sample	Variable (x)	x = 1		x = 0		diff.	*z*-stat	*p*-value
		N	= 1	N	= 1			
All Claims	*opaque*	753	0.510	2,716	0.414	0.096	4.69	0.00
	complex	701	0.512	2,768	0.415	0.097	4.61	0.00
	private	170	0.576	3,299	0.428	0.149	3.82	0.00

Panel B - Two-Sample Wilcoxon Rank-Sum Tests of Equality (%*award*)

Sample	Variable (x)	x = 1		x = 0		*z*-stat	*p*-value
		N	median	N	median		
All Claims	*opaque*	753	0.009	2,716	0.000	4.58	0.00
	complex	701	0.009	2,768	0.000	4.17	0.00
	private	170	0.137	3,299	0.000	4.81	0.00

This table reports the results from univariate tests for sample differences in investor arbitration awards when a claim involves an opaque security (*opaque*, *complex*, or *private* = 1) or does not involve an opaque security (*opaque*, *complex*, or *private* = 0). Panel A presents the test for sample differences in +*award*, an indicator variable, with a two sample test of proportions; and Panel B presents the tests for sample differences in %*award* with a Wilcoxon rank-sum test. See Section 2.1 for a discussion of the variables measuring investor awards (+*award* and %*award*), and Section 2.2 for a discussion of the variables measuring the securities at issue (*opaque*, *complex*, and *private*).

Table 6 - Full Sample Arbitration Award Regressions - Opaque Securities Measures

	$+award$				$\%award$			
	(1)		(2)		(3)		(4)	
sectype0 =	*opaque*		$\%opaque$		*opaque*		$\%opaque$	
sectype0	-0.071	(1.63)	-0.087*	(1.87)	0.005	(0.11)	0.012	(0.22)
fiduciary	0.007	(0.28)	0.004	(0.16)	0.011	(0.52)	0.009	(0.43)
fiduciary × *sectype0*	0.092**	(2.01)	0.116**	(2.25)	0.054	(1.22)	0.070	(1.33)
suitable	-0.019	(0.85)	-0.018	(0.80)	-0.020	(1.25)	-0.020	(1.26)
suitable × *sectype0*	0.118***	(2.78)	0.135***	(2.89)	0.062	(1.51)	0.078	(1.64)
disclose	-0.061***	(2.62)	-0.060***	(2.64)	-0.061***	(3.65)	-0.059***	(3.55)
disclose × *sectype0*	-0.004	(0.09)	-0.018	(0.39)	0.040	(0.99)	0.026	(0.56)
fraud	0.001	(0.03)	0.001	(0.06)	0.025	(1.52)	0.025	(1.51)
supervise	0.036**	(2.04)	0.038**	(2.13)	0.019	(1.14)	0.021	(1.28)
neglect	0.020	(0.91)	0.019	(0.87)	0.003	(0.15)	0.002	(0.11)
fair	-0.001	(0.06)	0.000	(0.00)	0.006	(0.28)	0.008	(0.36)
elder	0.072	(1.22)	0.072	(1.21)	0.115	(1.55)	0.117	(1.58)
fed-state	0.020	(1.12)	0.021	(1.13)	0.038**	(2.30)	0.039**	(2.30)
risk	0.000	(0.01)	0.001	(0.05)	-0.003	(0.15)	-0.001	(0.07)
margin	-0.054*	(1.66)	-0.053	(1.64)	-0.005	(0.17)	-0.004	(0.15)
unauthorized	0.050*	(1.72)	0.050*	(1.72)	0.004	(0.19)	0.006	(0.25)
churn	0.000	(0.01)	0.002	(0.06)	0.024	(0.79)	0.027	(0.90)
transact	-0.163***	(3.32)	-0.165***	(3.35)	-0.111***	(3.29)	-0.112***	(3.35)
tax	0.011	(0.13)	0.010	(0.12)	-0.085*	(1.66)	-0.088*	(1.71)
fees	-0.040	(1.06)	-0.042	(1.10)	0.005	(0.14)	0.002	(0.06)
unspecified	0.006	(0.13)	0.003	(0.07)	-0.006	(0.15)	-0.008	(0.20)
ln(*relief*)	-0.010	(1.32)	-0.010	(1.36)	-0.056***	(6.82)	-0.057***	(6.87)
ln(#*hearings*)	0.147***	(7.30)	0.148***	(7.42)	0.091***	(4.19)	0.092***	(4.24)
ln(#*investors*)	0.045	(1.40)	0.046	(1.43)	0.118***	(3.17)	0.119***	(3.22)
ln(#*firms*)	-0.124	(1.63)	-0.124	(1.62)	-0.057	(0.85)	-0.057	(0.86)
simplified	0.190***	(4.12)	0.192***	(4.17)	0.086**	(2.02)	0.087**	(2.06)
$\%public$	0.195**	(2.27)	0.193**	(2.24)	0.095	(1.23)	0.093	(1.19)
constant	-0.115	(0.72)	-0.109	(0.68)	0.031	(0.25)	0.037	(0.29)
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	3,469		3,469		3,469		3,469	
adj. R^2	0.061		0.061		0.077		0.078	

This table reports the results from regressions describing arbitration awards. The dependent variables are $+award$ and $\%award$. The variable $+award$ is equal to 1 if the investor award is positive, and 0 otherwise; and the variable $\%award$ is equal to the award amount divided by the claim amount. I model $+award$ with a linear probability model, and I model $\%award$ with ordinary least squares. The variables *opaque* and $\%opaque$ control for the opacity of the securities at issue. The variable *opaque* is equal to 1 if at least one of the securities at issue is opaque, and 0 otherwise; and the variable $\%opaque$ is equal to the proportion of the securities categories at issue that are opaque. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.

Table 7 - Full Sample Arbitration Award Regressions - Complex and Private Securities Measures

	+award				*%award*			
	(1)		(2)		(3)		(4)	
sectype1 =	*complex*		*%complex*		*complex*		*%complex*	
sectype2 =	*private*		*%private*		*private*		*%private*	
sectype1	-0.097**	(2.22)	-0.119**	(2.52)	-0.049	(1.10)	-0.050	(0.95)
sectype2	0.081	(0.54)	0.136	(0.88)	0.267*	(1.69)	0.306*	(1.88)
fiduciary	0.005	(0.21)	0.002	(0.08)	0.012	(0.58)	0.010	(0.48)
fiduciary × *sectype1*	0.117**	(2.48)	0.154***	(2.85)	0.060	(1.30)	0.080	(1.45)
fiduciary × *sectype2*	-0.057	(0.40)	-0.104	(0.70)	-0.132	(0.87)	-0.153	(0.95)
suitable	-0.019	(0.86)	-0.017	(0.78)	-0.025	(1.50)	-0.024	(1.46)
suitable × *sectype1*	0.160***	(3.53)	0.180***	(3.55)	0.127***	(2.81)	0.147***	(2.83)
suitable × *sectype2*	-0.130	(1.61)	-0.131	(1.46)	-0.130	(1.28)	-0.125	(1.09)
disclose	-0.060**	(2.58)	-0.057**	(2.52)	-0.058***	(3.43)	-0.055***	(3.26)
disclose × *sectype1*	-0.034	(0.78)	-0.060	(1.24)	0.003	(0.08)	-0.021	(0.44)
disclose × *sectype2*	0.110	(1.25)	0.096	(0.98)	0.109	(0.96)	0.103	(0.79)
Other Controls	Yes		Yes		Yes		Yes	
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	3,469		3,469		3,469		3,469	
adj. R^2	0.063		0.063		0.079		0.081	

This table reports the results from regressions describing arbitration awards. The dependent variables are *+award* and *%award*. The variable *+award* is equal to 1 if the investor award is positive, and 0 otherwise; and the variable *%award* is equal to the award amount divided by the claim amount. I model *+award* with a linear probability model, and I model *%award* with ordinary least squares. The variables *complex*, *private*, *%complex*, and *%private* control for the opacity of the securities at issue. The variables *complex* and *private* are equal to 1 if at least one of the securities at issue are complex or private, and 0 otherwise; and the variables *%complex* and *%private* is equal to the proportion of the securities categories at issue that are complex or private. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes the other control variables, state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.

Table 8 - Full Sample Number of Hearings Regressions

	#hearings (hazard ratios)			
	(1)		(2)	
#opaque	0.824***	(3.65)		
#complex			0.869***	(2.68)
#private			0.805**	(2.45)
#non-opaque	0.943*	(1.79)	0.947*	(1.68)
fiduciary	0.822***	(3.45)	0.827***	(3.31)
suitable	1.031*	(1.74)	1.079*	(1.67)
disclose	1.082	(1.59)	1.073	(1.53)
fraud	0.839***	(3.48)	0.842***	(3.38)
supervise	0.814***	(4.69)	0.811***	(4.76)
neglect	0.965	(0.75)	0.961	(0.84)
fair	0.878**	(2.37)	0.877**	(2.39)
elder	0.872	(1.21)	0.877	(1.15)
fed-state	0.902**	(2.50)	0.897***	(2.64)
risk	1.017	(0.33)	1.016	(0.31)
margin	0.942	(0.82)	0.942	(0.82)
unauthorized	0.925	(1.11)	0.921	(1.17)
churn	0.880	(1.63)	0.874*	(1.72)
transact	1.055	(0.52)	1.051	(0.49)
tax	1.112	(0.59)	1.117	(0.62)
fees	1.022	(0.23)	1.013	(0.14)
unspecified	0.885	(1.57)	0.886	(1.57)
ln(*relief*)	0.697***	(20.61)	0.697***	(20.52)
%award	0.731***	(4.64)	0.729***	(4.64)
ln(*#investors*)	0.751***	(4.56)	0.755***	(4.46)
ln(*#firms*)	0.462***	(4.28)	0.475***	(4.09)
#arbitrators	0.856**	(2.43)	0.859**	(2.39)
%public	1.243	(0.62)	1.262	(0.67)
Fixed Effects	Yes		Yes	
Other Effects	Yes		Yes	
N	2,779		2,779	
pseudo R^2	0.042		0.042	

This table reports the results from Cox regressions describing the number of hearings (*#hearings*). The table reports parameter estimates in the form of hazard ratios. A hazard ratio less than 1.0 indicates a one-minus-hazard-ratio decrease in the rate an arbitrator is able to determine an award, and a hazard ratio greater than 1.0 indicates a hazard-ratio-minus-one increase in the rate an arbitrator is able to determine an award. The variables *#opaque*, *#complex*, *#private*, and *#non-opaque* control for the securities at issue, and are equal to the number of securities categories that relate to the claim. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.

Table 9 - Univariate Tests of Arbitration Awards for Large and Small Claims

Panel A - Two Sample Test of Proportions (+*award*)

Sample	Variable (x)	x = 1		x = 0		diff.	z-stat	p-value
		N	= 1	N	= 1			
Large Claims	*opaque*	482	0.548	1,254	0.451	0.097	3.63	0.00
	complex	449	0.555	1,287	0.451	0.104	3.80	0.00
	private	135	0.570	1,601	0.470	0.101	2.25	0.02
Small Claims	*opaque*	271	0.443	1,462	0.383	0.060	1.85	0.06
	complex	252	0.437	1,481	0.385	0.052	1.55	0.12
	private	35	0.600	1,698	0.388	0.212	2.54	0.01

Panel B - Two-Sample Wilcoxon Rank-Sum Tests of Equality (%*award*)

Sample	Variable (x)	x = 1		x = 0		z-stat	p-value
		N	median	N	median		
Large Claims	*opaque*	482	0.038	1,254	0.000	4.51	0.00
	complex	449	0.043	1,287	0.000	4.36	0.00
	private	135	0.112	1,601	0.000	3.98	0.00
Small Claims	*opaque*	271	0.000	1,462	0.000	1.81	0.07
	complex	252	0.000	1,481	0.000	1.30	0.19
	private	35	0.258	1,698	0.000	3.03	0.00

This table reports the results from univariate tests for sample differences in investor arbitration awards when a claim involves an opaque security (*opaque*, *complex*, or *private* = 1) or does not involve an opaque security (*opaque*, *complex*, or *private* = 0). The univariate tests are conducted separately for large and small claims. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. Panel A presents the test for sample differences in +*award*, an indicator variable, with a two sample test of proportions; and Panel B presents the tests for sample differences in %*award* with a Wilcoxon rank-sum test. See Section 2.1 for a discussion of the variables measuring investor awards (+*award* and %*award*), and Section 2.2 for a discussion of the variables measuring the securities at issue (*opaque*, *complex*, and *private*).

Table 10 - Arbitration Award Regressions for Large and Small Claims - Opaque Securities Measures

Panel A - Regression Results for Large Claims

	+award				*%award*			
	(1)		(2)		(3)		(4)	
sectype0 =	*opaque*		*%opaque*		*opaque*		*%opaque*	
sectype0	-0.156*	(1.87)	-0.181**	(2.00)	-0.115	(1.63)	-0.106	(1.31)
fiduciary	-0.067	(1.42)	-0.071	(1.61)	-0.060*	(1.83)	-0.057*	(1.80)
fiduciary × *sectype0*	0.187**	(2.32)	0.235***	(2.71)	0.147**	(2.37)	0.163**	(2.30)
suitable	-0.028	(0.83)	-0.022	(0.70)	-0.041*	(1.88)	-0.039*	(1.82)
suitable × *sectype0*	0.130**	(2.22)	0.134**	(2.05)	0.087*	(1.76)	0.099*	(1.74)
disclose	-0.024	(0.73)	-0.025	(0.78)	-0.006	(0.29)	0.000	(0.02)
disclose × *sectype0*	-0.071	(1.25)	-0.086	(1.34)	0.012	(0.24)	-0.016	(0.30)
Other Controls	Yes		Yes		Yes		Yes	
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	1,736		1,736		1,736		1,736	
adj. R^2	0.070		0.070		0.080		0.081	

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Panel B - Regression Results for Small Claims

	+award				*%award*			
	(1)		(2)		(3)		(4)	
sectype0 =	*opaque*		*%opaque*		*opaque*		*%opaque*	
sectype0	-0.045	(0.78)	-0.067	(1.12)	0.036	(0.54)	0.031	(0.41)
fiduciary	0.030	(0.88)	0.031	(0.91)	0.022	(0.77)	0.021	(0.75)
fiduciary × *sectype0*	0.062	(0.89)	0.060	(0.78)	0.030	(0.36)	0.041	(0.42)
suitable	-0.008	(0.26)	-0.013	(0.40)	-0.022	(0.80)	-0.024	(0.86)
suitable × *sectype0*	0.104	(1.56)	0.154**	(2.08)	0.066	(0.79)	0.092	(0.96)
disclose	-0.096***	(3.07)	-0.094***	(3.10)	-0.133***	(5.04)	-0.133***	(5.10)
disclose × *sectype0*	0.078	(1.13)	0.068	(0.91)	0.078	(0.97)	0.081	(0.88)
Other Controls	Yes		Yes		Yes		Yes	
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	1,733		1,733		1,733		1,733	
adj. R^2	0.038		0.038		0.070		0.071	

This table reports the results from regressions describing arbitration awards. Panel A presents regression results for large claims, and Panel B presents regression results for small claims. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. The dependent variables are *+award* and *%award*. The variable *+award* is equal to 1 if the investor award is positive, and 0 otherwise; and the variable *%award* is equal to the award amount divided by the claim amount. I model *+award* with a linear probability model, and I model *%award* with ordinary least squares. The variables *opaque* and *%opaque* control for the opacity of the securities at issue. The variable *opaque* is equal to 1 if at least one of the securities at issue is opaque, and 0 otherwise; and the variable *%opaque* is equal to the proportion of the securities categories at issue that are opaque. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes the other control variables, state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.

Table 11 - Arbitration Award Regressions for Large and Small Claims - Complex and Private Securities Measures

Panel A - Regression Results for Large Claims

	+award				*%award*			
	(1)		(2)		(3)		(4)	
sectype1 =	*complex*		*%complex*		*complex*		*%complex*	
sectype2 =	*private*		*%private*		*private*		*%private*	
sectype1	-0.189**	(2.29)	-0.232***	(2.61)	-0.192***	(3.12)	-0.212***	(3.04)
sectype2	-0.025	(0.15)	0.035	(0.20)	0.144	(0.71)	0.214	(1.01)
fiduciary	-0.073	(1.57)	-0.079*	(1.79)	-0.071**	(2.13)	-0.069**	(2.17)
fiduciary × *sectype1*	0.243***	(2.94)	0.333***	(3.72)	0.239***	(3.98)	0.295***	(4.24)
fiduciary × *sectype2*	-0.028	(0.18)	-0.106	(0.62)	-0.174	(0.95)	-0.242	(1.24)
suitable	-0.028	(0.84)	-0.021	(0.65)	-0.042*	(1.92)	-0.038*	(1.77)
suitable × *sectype1*	0.167***	(2.68)	0.173**	(2.42)	0.107**	(1.98)	0.118*	(1.88)
suitable × *sectype2*	-0.101	(1.08)	-0.111	(1.05)	-0.016	(0.19)	-0.015	(0.17)
disclose	-0.023	(0.71)	-0.021	(0.68)	-0.005	(0.22)	0.004	(0.17)
disclose × *sectype1*	-0.116*	(1.91)	-0.157**	(2.29)	-0.015	(0.27)	-0.058	(0.92)
disclose × *sectype2*	0.134	(1.29)	0.152	(1.28)	0.075	(0.85)	0.060	(0.59)
Other Controls	Yes		Yes		Yes		Yes	
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	1,736		1,736		1,736		1,736	
adj. R^2	0.073		0.074		0.085		0.088	

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Panel B - Regression Results for Small Claims

	+award				*%award*			
	(1)		(2)		(3)		(4)	
sectype1 =	*complex*		*%complex*		*complex*		*%complex*	
sectype2 =	*private*		*%private*		*private*		*%private*	
sectype1	-0.063	(1.08)	-0.087	(1.46)	0.005	(0.07)	0.000	(0.00)
sectype2	0.461**	(2.12)	0.463**	(2.07)	0.577***	(3.10)	0.537**	(2.55)
fiduciary	0.028	(0.83)	0.029	(0.85)	0.019	(0.68)	0.018	(0.64)
fiduciary × *sectype1*	0.066	(0.91)	0.063	(0.79)	-0.055	(0.73)	-0.055	(0.64)
fiduciary × *sectype2*	-0.194	(0.83)	-0.175	(0.73)	0.158	(0.63)	0.198	(0.69)
suitable	-0.003	(0.10)	-0.009	(0.28)	-0.022	(0.78)	-0.025	(0.89)
suitable × *sectype1*	0.137**	(1.96)	0.196**	(2.54)	0.167**	(2.30)	0.201**	(2.44)
suitable × *sectype2*	-0.318*	(1.85)	-0.295	(1.62)	-0.556*	(1.69)	-0.449	(1.22)
disclose	-0.094***	(3.03)	-0.092***	(3.03)	-0.127***	(4.74)	-0.128***	(4.84)
disclose × *sectype1*	0.061	(0.85)	0.047	(0.61)	0.020	(0.28)	0.022	(0.27)
disclose × *sectype2*	0.018	(0.11)	-0.035	(0.18)	-0.008	(0.02)	0.021	(0.05)
Other Controls	Yes		Yes		Yes		Yes	
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	1,733		1,733		1,733		1,733	
adj. R^2	0.040		0.040		0.085		0.086	

This table reports the results from regressions describing arbitration awards. Panel A presents regression results for large claims, and Panel B presents regression results for small claims. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. The dependent variables are *+award* and *%award*. The variable *+award* is equal to 1 if the investor award is positive, and 0 otherwise; and the variable *%award* is equal to the award amount divided by the claim amount. I model *+award* with a linear probability model, and I model *%award* with ordinary least squares. The variables *complex*, *private*, *%complex*, and *%private* control for the opacity of the securities at issue. The variables *complex* and *private* are equal to 1 if at least one of the securities at issue are complex or private, and 0 otherwise; and the variables *%complex* and *%private* is equal to the proportion of the securities categories at issue that are complex or private. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes the other control variables, state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.

Table 12 - Number of Hearings Regressions for Large and Small Claims

	#hearings (hazard ratios)				*#hearings* (hazard ratios)			
	(1) Large Claims		(2) Large Claims		(3) Small Claims		(4) Small Claims	
#opaque	0.767***	(3.97)			0.964	(0.44)		
#complex			0.842**	(2.50)			0.937	(0.78)
#private			0.750***	(2.77)			0.990	(0.05)
#non-opaque	0.948	(1.31)	0.957	(1.09)	0.918*	(1.69)	0.909*	(1.87)
fiduciary	0.837**	(2.23)	0.847**	(2.03)	0.802***	(2.58)	0.801***	(2.60)
suitable	1.038	(0.71)	1.033	(0.63)	1.035	(0.47)	1.037	(0.50)
disclose	1.035	(0.63)	1.030	(0.53)	1.053	(0.78)	1.055	(0.79)
fraud	0.856**	(2.26)	0.862**	(2.16)	0.785***	(3.36)	0.786***	(3.34)
supervise	0.798***	(4.23)	0.794***	(4.38)	0.838***	(2.62)	0.838***	(2.63)
neglect	0.963	(0.60)	0.959	(0.65)	1.051	(0.71)	1.053	(0.74)
fair	0.873**	(2.09)	0.869**	(2.16)	0.899	(0.91)	0.896	(0.94)
elder	0.861	(1.02)	0.861	(1.01)	0.795	(1.20)	0.796	(1.20)
fed-state	0.941	(1.18)	0.935	(1.30)	0.837**	(2.45)	0.839**	(2.43)
risk	1.001	(0.02)	1.001	(0.02)	1.054	(0.60)	1.056	(0.61)
margin	0.913	(1.16)	0.912	(1.17)	1.049	(0.29)	1.047	(0.27)
unauthorized	0.870	(1.55)	0.864	(1.61)	1.008	(0.08)	1.009	(0.09)
churn	0.848*	(1.79)	0.838*	(1.91)	1.019	(0.13)	1.019	(0.13)
transact	1.238	(1.45)	1.219	(1.35)	0.964	(0.22)	0.960	(0.25)
tax	0.935	(0.32)	0.944	(0.28)	1.528*	(1.68)	1.533*	(1.69)
fees	0.925	(0.67)	0.914	(0.77)	1.210	(1.50)	1.211	(1.51)
unspecified	0.941	(0.61)	0.942	(0.60)	0.835	(1.22)	0.832	(1.24)
ln(*relief*)	0.688***	(16.01)	0.688***	(15.92)	0.738***	(4.35)	0.739***	(4.34)
%award	0.650***	(7.40)	0.650***	(7.41)	0.823*	(1.92)	0.823*	(1.92)
ln(*#investors*)	0.725***	(4.99)	0.728***	(4.93)	0.715*	(1.85)	0.713*	(1.87)
ln(*#firms*)	0.524***	(3.16)	0.548***	(2.89)	0.331***	(2.86)	0.332***	(2.84)
#arbitrators	1.198	(1.05)	1.200	(1.07)	0.545***	(3.14)	0.547***	(3.13)
%public	2.226**	(2.05)	2.308**	(2.15)	0.077**	(2.17)	0.079**	(2.15)
Fixed Effects	Yes		Yes		Yes		Yes	
Other Effects	Yes		Yes		Yes		Yes	
N	1,726		1,726		1,036		1,036	
pseudo R^2	0.029		0.029		0.040		0.040	

This table reports the results from Cox regressions describing the number of hearings (*#hearings*). The regressions are estimated separately for large and small claims. A claim is large if investors claim compensatory damages greater than or equal to $138,000, and a claim is small if investors claim compensatory damages less than $138,000. The table reports parameter estimates in the form of hazard ratios. A hazard ratio less than 1.0 indicates a one-minus-hazard-ratio decrease in the rate an arbitrator is able to determine an award, and a hazard ratio greater than 1.0 indicates a hazard-ratio-minus-one increase in the rate an arbitrator is able to determine an award. The variables *#opaque*, *#complex*, *#private*, and *#non-opaque* control for the securities at issue, and are equal to the number of securities categories that relate to the claim. The variables controlling for the violations investors assert (e.g., *fiduciary*, *suitable*, and *disclose*) are equal to 1 if investors assert its violation, and 0 otherwise. The regression model includes state and year fixed-effects, and firm effect variables and repeat-claim effect variables. See Section 2 for a full description of the variable specifications. I calculate the t-statistics (in parentheses) with cluster-robust standard errors at the firm and year level. Significance at the 90% confidence level is denoted by *, at the 95% confidence level by **, and at the 99% confidence level by ***.