JUDICIAL DECISIONS AND FINANCIAL ADVICE.
The Role of Transparency and Investor Sophistication.∗

Juan José Ganuza†, Fernando Gomez‡ and Jose Penalva§


Abstract

Both before and after the financial crisis, the marketing, and sale of financial products has given rise to serious concerns about mis-selling to customers. In many cases, this has led to important numbers of lawsuits filed against firms providing advice. In the paper we provide a simple agency model of financial advice -broadly understood- where potential clients have some information about the matching of the product with the investor’s preferences, and at the same time receive advice about which product to buy. Even financial products that are a good match may generate losses, and this will lead to litigation from aggrieved investors. Courts do not directly observe the honesty and fairness of the advice, but only an evidentiary signal. We explore the optimal court policy in order to provide incentives to advisers to procure honest financial advice, and show how it depends on the accuracy of the effective information that investors have, which in turn depends on the sophistication of the client and the overall amount and quality of information on financial products that advisers provided outside specific (implicit or explicit) advice. The analysis sheds lights on the structure of legal duties for investment services firm under the MiFID II scheme that has entered into force in Europe in January 2018.

Keywords: Transparency, Retail Investors, Financial Advice and Liability.


∗We wish to thank the comments from audiences at AEDE (Lleida), EALE (Milan), University of Bologna and University of Copenhagen. Juan-José Ganuza gratefully acknowledges the hospitality of FUNCAS as well as the Financial support of the Spanish Ministry of Science and Innovation under project ECO2014-59225-P, the Barcelona GSE Research Network, and the Generalitat de Catalunya. Fernando Gomez acknowledges the financial support of the Spanish Ministry of Science and Innovation under projects DER 2017-82673-R. José Penalva’s research has benefitted from financial support from grant 2016/00118/001 (MINECO/FEDER, UE). Corresponding author: jpenalva@emp.uc3m.es.

†Department of Economics. University Pompeu Fabra.
‡Department of Law. University Pompeu Fabra.
§Business Department, Universidad Carlos III de Madrid.
Introduction

Financial decisions are hard to take. Most individuals, even those with some knowledge of financial matters, are subject to mistaken beliefs, to biases and to lack of information that lead them to make poor choices in the financial sphere. The behavioral economics literature has unearthed some of those shortcomings resulting in far from desirable decisions: Benartzi and Thaler (2007).

Given this situation, it comes as no surprise that financial advice from experts plays a large role in “helping” people to make better choices. Empirical evidence points at the fact that financial advice is a pervasive phenomenon in the area of investment decisions. Hung et al (2008), for instance, report that 73% of US investors rely on professional advice for their financial decisions. Seeking financial advice seems not be random across classes of investors, as defined by their financial literacy and sophistication. Bucher-Koenen and Koenen (2015) find that wealthier, better educated, more financially literate investors contact advisers more often before taking investment decisions. Calcagno and Monticone (2015) also show that financial literacy increases the probability of consulting a financial adviser, and reduces the probability of making independent investments. However, this does not imply that financial advice ultimately controls investors’ decision making. Investors, especially more sophisticated ones, are not helpless, or at least they do not rely solely on the advice specifically addressed to them. Financial sophistication of investors increases the likelihood of receiving advice, but reduces the likelihood of following the advice, and purchasing the products recommended by the adviser: Bhattacharya et al. (2011). Hoechle et al. (2017), in turn, show the poor performance of advised portfolios vis-à-vis independently chosen ones, and Mullainathan et al. (2012) find that financial advice fails to de-bias behaviorally impaired investors, and even amplifies some of the prevailing biases among financial customers.

Not only are there concerns about the ineffectiveness of financial advice in improving individual decision-making, but also about adviser misconduct. Egan et al. (2017), in a large-scale study,
report that 7% of advisers in the US have misconduct records, reaching 15% at some of the largest advisory firms. Approximately 33% of advisers with a finding of misconduct are actually repeat offenders.

Unsurprisingly, the enhanced public distrust of the functioning of financial markets in the aftermath of the financial crisis, has reached the area of financial advice, and some of the important modifications in the legal and regulatory framework governing financial institutions and financial activities have touched this area, in addition to others (such as regulation and supervision of financial institutions, and increased regulation of some “sensitive” markets, such as the mortgage market).

In the EU, the concern with problems in the marketing and sale of financial products to retail investors, comprising the financial advice linked to the distribution of financial instruments, has translated into the introduction of new, more stringent, legal rules. There is no shortage of instances of egregious mis-selling of financial investments to consumers in various EU countries. Italy and Spain are perhaps the ones in which the cases have reached largest proportions.

In Italy, the recent resolution of certain Italian banks has revealed how many banks depositors were seriously exposed to the banks’ risk through subordinated debt that had been sold by the latter to their customers.\(^1\)

In Spain, the “preferentes” saga very well illustrates the deficiencies in the sale of financial instruments to retail investors.\(^2\) “Preferentes” are hybrid financial products which combine characteristics from both equity and debt. These products are essentially equivalent to perpetual junior debt (as they are repayable only at the discretion of the issuer and they do not confer voting rights to the holder). Furthermore, the coupon is paid depending on the profits accrued to the issuing entity. These products had been traded in financial markets for some years before the financial crisis, but were predominantly sold to, and traded, by professional investors. Given their subordinated nature, they enjoyed the status of regulatory capital, and thus, Spanish financial

---

\(^1\) See, Enríques and Gargantini (2017).

\(^2\) See, Santos (2017).
When the financial crisis erupted, liquidity dried up and some banks, especially savings banks (“Cajas”), found themselves in urgent need to raise capital in order to cover the heavy losses the real estate bust was exposing, as well as to satisfy the increased capital requirements that supervisors were imposing on them in order to avoid resolution. In this context, banks found in the “preferentes” a valuable tool (since they qualify as regulatory capital) so they started marketing them to their own depositors. However, as (despite the recapitalization efforts imposed by supervisors) many of those institutions failed or were rescued by the taxpayer, investors in “preferentes” saw their investments being wiped out or subject to a substantial haircut. Some calculations bring the figure of “preferentes” sold to consumers to something close to €14 bn. The official report\(^3\) in 2015 of the Committee set up by the Spanish Government to oversee disputes between consumers and issuers estimates that the face value of “preferentes” issued to retail investors by just two institutions (former Cajas: Bankia and Catalunya Caixa) approached €8 bn., and the number of affected investors exceeded 400,000.

Unsurprisingly, many legal claims have been brought against the financial institutions who sold such investments to retail investors how subsequently suffered heavy losses. The Spanish Committee’s official 2015 report shows that over 78% of retail investors who bought “preferentes” later brought legal claims against the banks now in public hands (Bankia and Catalunya Caixa).\(^4\)

Both in Italy and Spain, governments had to intervene and set up alternative dispute resolution schemes in order to avoid clogging the court system with all these claims.\(^5\) Despite these ADR mechanisms, the number of cases that have ended up in court is, reportedly, very high.

Prior to the financial crisis, the EU had adopted a comprehensive framework for investment services trying to ensure that high standards be observed by investment firms in their dealings with their clients,\(^6\) and especially, with retail investors. The uneasiness about the ability of these

\(^3\)Comisión de Seguimiento de Instrumentos Híbridos de Capital y Deuda Subordinada (2015).
\(^5\)See on the details of the schemes both in Italy and Spain, Della Negra (2014).
\(^6\)This is the so-called MiFID I, resulting from Directive 2004/39/EC (MiFID I), Directive 2006/73/EC (MiFID I Implementing Directive), and Regulation 1287/2006/EC (MiFID I Implementing Regulation).
rules to deter misconduct in the area of marketing and financial advice to retail investors led to new and ambitious legislative scheme in this area, the MiFID II framework. This new regulatory architecture for investment services is comprised of Directive 2014/65/EU (MiFID II), and Regulation 600/2014/EU (MiFIR), together with a very large number of detailed measures implemented through the European Securities and Markets Authority (ESMA). A crucial portion of these new regulatory tools tries to subject the firms involved in providing investment services of various kinds (transmission and execution of orders, managing of investment portfolios, commercialization of financial products, investment advice) to certain duties and rules of conduct that would, or at least are aimed at, improve investor protection and stable financial markets. The goal of consumer protection and market stability are explicit in the recitals of MiFID II.

The overarching legal duty presiding over the behavior of a firm that provides investment services is that of acting “honestly, fairly and professionally in accordance with the best interests of its clients” (art. 24(1) MiFID II). Other more specific duties, imposing requirements that depend on various circumstances -type of service, type of client, type of financial instrument, etc.- arise in connection with information disclosure, knowledge and assessment of the client -Know Your Customer Rules, leading eventually to tests of appropriateness and suitability of the product to the investor-, management of conflicts of interest, execution of instructions, recording and communication, and so forth.

When a firm providing investment services engages in conduct that infringes upon these duties, legal liabilities are likely to arise. They may adopt the form of regulatory sanctions imposed by the authorities in charge of supervising the activities of the relevant firms, or of the payment of damages vis-à-vis the affected investors in contract, tort, or some other available private law remedy. As a result, there are incentives for compliance with the established duties arising from

7See generally on MiFID II, Busch and Ferrarini (2017).
8Art. 70 (1) MiFID II determines that “[..] Member States shall lay down rules on and ensure that their competent authorities may impose administrative sanctions and measures applicable to all infringements of this Directive of Regulation (EU) No 600/2014 and the national provisions adopted in the implementation of this Directive and of Regulation (EU) No 600/2014, and shall take all measures necessary to ensure that they are implemented.”
9The European Court of Justice, in the Genil or Bankinter case (C-604/11, 30 May 2013) not only allows for
legal liabilities that will be determined, or reviewed, by courts. In this task, courts will need to make an assessment of the behavior of the firm in the provision of investment services to its customers.

One of the actions by investment firms that seems to be more relevant for triggering legal duties and liabilities is precisely the provision of financial advice to clients. In MiFID II (and also in MiFID I), some of the duties -like the suitability assessment of a product to the client- are linked to a defined concept of “investment advice”.

The aim of this paper is to explore how legal liability for misconduct in financial advice operates in an abstract setting where factors such as investor’s sophistication, and the amount, clarity, and quality of information provided by advisers interact with the liability system. From this, we believe, some lessons may be drawn for shaping and implementing the legal regime governing financial advice, although we do not pretend to be able to make sense of the legal notions and categories, in a narrow sense, to be found in MiFID II.

By financial advice we refer to the actions financial firms take in order to influence the decisions of retail investors with regard to how they structure their financial decisions, such as, for example, which financial instruments to buy.

Sometimes this financial advice will be “hard”, in the sense of falling squarely under the legal term of “financial advice”, i.e. as a specific recommendation by the firm to make a given choice and addressed to a particular client. In other circumstances, it may be a “softer” or more subtle form of advice, through which the firm conveys an implicit recommendation, or presents the choices to the client in such a way as giving a hint as to what constitutes the preferred alternative. Obviously, such financial advice, either in a “hard” or a “soft” version, may be more or less “honest”, in the sense that it may or may not correspond with what the firm observes as the best interest of the client in terms of the match between the long-term profitability and riskiness of the investment and the needs of the client.

contractual remedies based on the infringement of MiFID duties, but also determines that Member States are bound by obligations of equivalence and effectiveness to set non-regulatory remedies for the infringement of such duties.
In this paper we provide a simple model of financial advice given by advisers to investors on the acquisition of a financial instrument or asset, under the shadow of potential legal liabilities imposed (or reviewed, at least), by a court that ex post verifies the behavior of the firm under conditions of imperfect information: the court only receives a signal about the kind of financial advice provided by the firm, in particular, whether the firm was honest (or the advice was of good quality or suitability) or dishonest (or the advice was of bad quality or suitability).

Our main finding is that when courts cannot directly observe the relevant behavior by the financial adviser himself, but only an informative signal, the optimal design of a liability policy intending to induce honest advice from the investment firms depends on the sophistication of the investor, and also on the quality and accuracy of the information that investors receive outside the advice itself.

Part of that investment information may become available to the consumer through various sources, but a substantial fraction of it would be provided -or not- by the financial adviser, in the form of, among others, easily readable reports on past returns and volatility from a range of products or a set of issuers of financial instruments, general accessible information by the firm on certain general features of investment decisions and alternatives (diversification, hedging, risk profile, adjustment of characteristics to different age- and income-profiles, etc.), and other similar pieces of information. These may be valuable to make the information investors have on alternative investment products more accurate. This information elaborated and communicated by the investment firm, moreover, may be drafted and presented with varying degrees of clarity and comprehensibility, and may be more or less complete in terms of coverage. We denote by “transparency” the overall “quality” of that general information, that affects the accuracy with which investors perceive the match of a product with her own preferences or characteristics.

It should be noticed that we do not include within our notion of transparency other pieces of information that would allow investors to directly assess the honesty of the advice, and the concurrence and intensity of a conflict of interest afflicting the financial adviser. Think of the
existence of third-party inducements or commissions, the dependent or independent nature of the financial advice, the incentive scheme of employees or agents performing the advisory services. These are factors that would have an important and immediate bearing on the perception by clients of the degree and magnitude of conflicts of interest and how they will have an influence on the honesty and fairness of the financial advice given to the investor. We do not consider them, obviously, not because we think this is not an interesting and important problem (it is both), but it has already been extensively analyzed in the literature.\(^\text{10}\)

Thus, the result of our model is that the level of stringency of court-imposed liability on financial advisers for the lack of fairness and honesty in the advice decreases optimally with the experience and sophistication of the investor, and with the level of transparency of the adviser’s information. It should be emphasized that this outcome does not depend on sophistication and/or transparency facilitating the ex post task of the court in assessing whether advice was honest or not, it is an effect of the impact of the level of transparency and sophistication on the accuracy of the perception by the client and, consequently, on the revenue function of the financial adviser.

Our basic model is presented in a setting where there is only one type of adviser, but we extend our analysis and show how it also holds in a more complex setting of heterogeneous advisers. Here, when certain plausible properties of the social welfare function are present, our main results remain valid.

It is also interesting to note, in policy terms, that the positive effect of client sophistication on the leniency of expected liability for the adviser would tend to counteract the incentive of investment firms to cater to unsophisticated, gullible investors, because the presence of such investors would increase expected liability payments to the investors who have suffered losses from the financial products marketed and sold by the adviser.\(^\text{11}\)

A similar approach is used by us in a related project in a setting of quality effort of manufacturers\(^\text{10}\)Inderst and Ottaviani (2009, 2010, 2012 a, 2012b, 2012c), although without an ex-post imperfect liability system in place.\(^\text{11}\)For different reasons, this is a favorable property shown by other regulatory measures (disclosure of conflicts of interest, increased monitoring of investment firms, minimum statutory rights) who also discourage advisers to target naive investors: Inderst and Ottaviani (2012c, 2013).

Several papers explore conflicts of interest in financial advice, how alert and naïve consumers would differently react to the advice, and the welfare consequences of various policy interventions: Inderst and Ottaviani (2009, 2012a, 2012b, 2012c). Other contributions explore similar issues in a long-term setting, where cancelling the contract ex post is a relevant feature (Inderst and Ottaviani (2013). Others have analyzed experimentally how the disclosure of conflicts of interest affects both sides of the interaction, that is, the reactions by investors and advisers to the disclosure: Cain, Loewenstein, and Moore (2005, 2011), Loewenstein, Cain, and Sah (2011), and Sah, Loewenstein and Cain (2013).

The previous literature does not consider our setting in which there is an ex-post liability regime implemented by courts who do not observe the underlying adviser’s behavior, but only receive an informative signal, and thus need to determine an evidentiary rule on the imposition of liability in order to provide incentives for honest advice.

The paper is organized as follows. Section 2 presents the basic model of financial advice and potential firm misbehavior, as well as how legal standards of liability are set in the presence of evidentiary uncertainty as to the kind of financial advice actually provided. Section 3 explores how legal standards should depend on the transparency of the overall marketing policies adopted by firms, and on the sophistication of the client receiving the advice. Section 4 considers the optimal policy and the endogenization of two of our key parameters, client’s sophistication and transparency level of the adviser’s general investment information. Section 5 deals with an important extension of our basic setting, namely that of heterogeneous advisers. Section 6 briefly
draws some implications and concludes.

2 The model

2.1 Financial advice, transparency and revenue

We device a very simple agency model of financial advice. Consider an adviser (a financial institution, or, more generally, a firm) who sells assets and provides recommendations to an investor and potential client. There are three possible assets: a riskless asset $S$, that generates zero return and zero rents to the financial institution (the supply of such asset is perfectly competitive) and two risky assets, $S_1$ and $S_2$, that generate rents $r_{S_1} < r_{S_2}$ for the financial institution.

The return of the risky asset to the investor depends on the matching between the assets payoffs and the preferences of the investor. If the match is bad (state $B$), the net return of the asset to the investor (discounting the price) is negative and generates a loss of $L$ with probability 1. If the match is good (state $G$), then with probability $p$ the return is negative and generates a loss of $L$ but with probability $1 - p$ the project generates a net return of 1.

We focus on the case where the expected return of the risky asset when the match is good is higher than that of the riskless asset, i.e., $1 - p - pL > 0 \Rightarrow p < \frac{1}{1 + L}$. Assets are perfectly negatively correlated. We are implicitly assuming, as Inderst and Ottaviani (2009), a hotelling environment in which investors are located either close to asset 1 or close to asset 2. The probability that asset $S_1$ ($S_2$) is a good match is $\alpha$ ($1 - \alpha$).

The financial adviser knows how the asset matches with the investor, and decides to recommend either $S_1$ or $S_2$. The investor decides between the riskless asset and the recommended risky asset. To do this, she uses the effective information available to her.

The effective information available to the investor is captured by the accuracy parameter $\gamma$. A higher value of $\gamma$, represents better, more effective information. The effectiveness of the investor’s information, $\gamma(\theta, \delta)$, depends positively on two factors: the level of sophistication of the investor,
\( \theta \), and the amount, quality, and clarity of the information provided by the adviser, \( \delta \), that we label as transparency for short. More effective information enhances the probability of buying the asset when it is a good match over that of buying the asset when it is a bad match.

To capture this, we introduce the outcome of the investor’s decision process in a reduced form: Let \( p^G(\gamma) \) capture the probability that the investor buys the asset when it is a good match, and \( p^B(\gamma) \) the probability that the investor buys the asset when it is a bad match. With complementary probability the investor decides to buy the riskless asset \( S \).

We assume that \( p^G(\gamma) > p^B(\gamma) \) for all positive levels of accuracy, since it seems intuitive to imagine that it is always more likely that a product that is a good match will be sold and bought rather than a financial product that is a bad match. Furthermore, the higher the accuracy \( \gamma \), the higher (the lower) the probability of the client buying a good product (a bad product), \( p^G(\gamma)' > 0 \) and \( p^B(\gamma)' < 0 \). For example, we can consider

\[
\begin{align*}
p^G(\gamma) &= \frac{1}{2} + \gamma \\
p^B(\gamma) &= \frac{1}{2} - \gamma.
\end{align*}
\]

An additional issue is how aligned are the interests of adviser and investor. With probability \( 1 - \alpha \) the incentives of the financial adviser and the investor are aligned, since \( S_2 \), which is the most profitable one for the financial institution, is in fact also the best product for the investor. However, with probability \( \alpha \), there is a conflict of interest and the financial adviser may follow one of two policies, \( P \in \{H, D\} \), where \( H \) stands for honesty, that is, advising the investor to buy \( S_1 \), and \( D \) for dishonesty, that is, advising the investor to buy \( S_2 \). In the latter case, we assume that the financial adviser incurs a moral or reputational cost \( \beta \).

Then, the expected revenues for the financial adviser from honest and dishonest policies are

\[
\begin{align*}
R(H, \gamma) &= (1 - \alpha)p^G(\gamma)r_{S_2} + \alpha p^G(\gamma)r_{S_1}, \\
R(D, \gamma) &= (1 - \alpha)p^G(\gamma)r_{S_2} + \alpha (p^B(\gamma)r_{S_2} - \beta),
\end{align*}
\]
respectively.
Depending on the value of the parameters, the difference may be positive or negative and so are the incentives of the financial adviser:

\[ R(H, \gamma) - R(D, \gamma) = \alpha(p^G(\gamma)r_A - p^B(\gamma)r_B + \beta) \]

It is important to analyze how this difference between both revenue functions depends on the accuracy parameter \( \gamma \) and indirectly on the level of the buyer sophistication \( \theta \) and the level of transparency \( \delta \). As the benefits from selling a good product increase with \( \gamma \) and the benefits from selling a bad product decrease with \( \gamma \), the difference of revenues between honest and dishonest policies is increasing with \( \gamma \) or, in other terms, the revenue function is supermodular in honesty and accuracy (and sophistication and transparency). This supermodularity means more effective information makes it more likely that it is optimal for the adviser to follow a policy of honesty.

Given the importance of this property of the revenue function for the subsequent analysis we state it as a proposition.

**Proposition 1** The revenue function, \( R \), is supermodular in the honesty decision and accuracy.

An immediate corollary of this result is that the adviser's incentives depend on the level of \( \gamma \). If the adviser's decision is not trivial, and absent other factors such as liability and litigation, he will choose to be dishonest for lower values of \( \gamma \) and honest for higher values of \( \gamma \).

### 2.2 The Litigation Phase: Evidence of Misbehavior

Regardless of the adviser's behavior, we assume the investor will bring a case before the Court whenever she suffers a loss.\(^{12}\) In order to simplify the analysis we disregard litigation costs, the possibility of the victim not bringing the case before a Court, and the possibility of settlement. These are a non-trivial assumptions, but ones that allow us to abstract from other dimensions of the problem.

\(^{12}\) Alternatively, one may think of the client reporting the case to the relevant supervisor so that the latter may impose a sanction of a known size for the infringement of the adviser’s duties (such as that of acting honestly, fairly, and in the best interest of the client, as is required in MIFID II).
The Court then rules whether the financial adviser has to pay an amount \( L \) to the investor (if there has been misbehavior that this the adviser has been dishonest) or not (if even if the asset has produced losses, the advice was honest). The Court makes this ruling observing both the level of sophistication of the investor, \( \theta \), and the level of transparency in the information provided by the adviser, \( \delta \), (the investor can be ex post assessed by the Court, and the information is likely to have left hard evidence of its content) but without direct observation of the honesty of the advice.

In order to establish the nature of the adviser’s behavior, the Court has to rely on the evidence brought before it by the parties in any admissible form: examination and cross-examination of experts and witnesses, looking into the exchanges and communications between investor/client and adviser, etc. Let the total evidence available to the Court be represented by a generic signal \( \pi \in [0, 1] \), which summarizes an index of the amount of evidence indicating honesty. Formally, a signal \( \pi \) is a realization of a random variable \( \Pi \) with distribution function \( f(\pi|P) \). This distribution depends on the type of advice, \( P = H \) or \( D \), but not on \( \gamma, \theta \) or \( \delta \). Later we allow for the possibility that these parameters affect the evidence available to the Court. For convenience, we assume that \( f \) is differentiable and non-zero on \([0, 1]\).\(^{13}\) Let \( F(\pi|P) \) denote the cumulative distribution function corresponding to the Court’s signal.

A higher value of \( \pi \) represents greater evidence that in the particular case before the Court the advice was honest. To ensure that honesty translates into more evidence of good behavior, we assume that signals are monotone, that is, \( f(\pi|P) \) satisfies the Monotone Likelihood Ratio Property (MLRP):

\[
\frac{f(\pi|H)}{f(\pi|D)} \text{ is increasing in } \pi.
\]

This condition ensures that more evidence is “good news” about honesty (Milgrom (1981)), that is, \( \Pr(H|\pi) \) is increasing in \( \pi \).

\(^{13}\)One of the implications of having full support on \([0, 1]\) is that the evidence before the Court is insufficient to identify the honesty of the advice with certainty.
2.3 *The Court’s decision problem*

The Court wishes to provide incentives to financial advisers to be honest. We also assume that the Court is concerned with penalizing honest advisers. This is a natural assumption in an initial setting since, as we will see below, finding liable an innocent adviser (Type I error) is the only error that can arise in equilibrium. Below we will consider an extension in which the possibility of both Type I and Type II errors arise in equilibrium.

The Court can commit to a decision rule that is based on the evidence presented when the investors suffer losses. We assume that the Court uses a threshold decision rule which is defined as follows: if the evidence brought before the Court $\pi$ is above a given threshold level, $\bar{\pi}$, then the Court finds that there is sufficient evidence that the advice was honest, and rules that there is no liability. On the other hand, if $\pi < \bar{\pi}$, then the Court finds the financial adviser liable.\(^{14}\)

For any level of accuracy in the client’s signal and Court’s threshold rule characterized by the evidentiary standard, $\bar{\pi}$, the adviser will choose the honest policy if the profits from doing so are greater than those of being dishonest, that is, if

$$R(H, \gamma) - pF(\bar{\pi}|H)L \geq R(D, \gamma) - F(\bar{\pi}|D)L.$$ \hspace{1cm} (IC)

We focus on the interesting case where it is not in the financial adviser’s self-interest to follow a policy of honesty in the absence of potential liability, that is when $R(H, \gamma) \leq R(D, \gamma)$. With this assumption, the Court may be able to encourage honest behavior via legal liability.

As we said before, when setting an evidentiary threshold, the Court is interested, not only in encouraging honesty, but also to do so in a way that minimizes Type I error. Type I error is the probability that the Court mistakenly holds liable an honest adviser, one who is actually “innocent”. When the Court uses a standard $\bar{\pi}$, this probability is $F(\bar{\pi}|H)$. Minimizing Type

\(^{14}\)The assumption that the Court uses a threshold rule is harmless, as Gamuza et al (2015a) show in a more general setting that the Court’s optimal decision rule in this informational setup (monotone signals) is a threshold rule. Additionally, threshold rules such as negligence, or the infringement of a legal duty, seem to be pervasive in most legal systems, though obviously the specific threshold and the factors underlying it vary greatly across legal systems and settings.
I error is then equivalent to minimizing the expected liability of honest advisers. Similarly, the probability that the Court mistakenly acquits an unworthy adviser (Type II error), is $1 - F(\bar{\pi}|q_L)$. The Court’s problem can be written as:

$$\min_{\bar{\pi}} p \ F(\bar{\pi}|H) \text{ subjectto}(IC).$$

(1)

2.4 Timing when $\gamma$ is given

The timing of the model is as follows: 1) Given $\gamma$, the law sets the evidentiary standard, $\bar{\pi}$. 2) The financial adviser chooses the nature of the advice, the investor perceives a signal about her match with the advised product, and revenue $R(P, \gamma)$ is realized. 3) Nature determines returns (and eventually losses) from the asset, as well as the Court’s signal $\pi$ according to the probabilities and information structures described above. 4) Finally, in case of the client incurring losses, a lawsuit is filed, and the adviser may be forced to pay a monetary amount, according to the realized evidence and the Court’s decision rule.

3 The equilibrium

3.1 Minimizing errors, maximizing incentives

We use the notation $T_I(\bar{\pi}) = F(\bar{\pi}|H)$ to denote the Type I errors committed by a Court that imperfectly observes the adviser’s actions and uses an evidentiary standard $\bar{\pi}$. Similarly, Type II errors occur with probability $T_{II}(\bar{\pi}) = 1 - F(\bar{\pi}|D)$. The Court’s problem, on Equation (1), is equivalent to the following, more convenient, error minimization problem$^{15}$:

$$\min_{\pi} T_I(\bar{\pi})$$

s.t. $pT_I(\bar{\pi}) + T_{II}(\bar{\pi}) \leq 1 + \frac{R(H, \gamma) - R(D, \gamma)}{L}.$

(2)

$^{15}$This method was proposed by Ganiuza et al (2015a).
On the left hand side of equation (2) we find the errors generated by the Court’s choice of evidentiary threshold, $\bar{\pi}$, which can be described more compactly using the weighted error function $\Phi (\bar{\pi}) = pT_I (\bar{\pi}) + T_{II} (\bar{\pi})$. The next result characterizes the function $\Phi (\bar{\pi})$.

**Lemma 1** The weighted error function is positive, continuous, and convex, and has a unique minimum on the interval $[0, 1]$ at $\pi_{\text{min}}$. The function takes values $\Phi (0) = 1$ and $\Phi (1) = p$.\(^{16}\)

Let $\Phi_D$ be the error function defined on the set $D = [0, \pi_{\text{min}}]$, so that $\Phi_D$ is a decreasing function (and a higher standard increases the incentives to invest in product quality).

Figure 1 illustrates the shape of the $\Phi$ function (for $p = 0.75$) as well as $\pi_{\text{min}}$, the interval $D$, and the function $\Phi_D$.\(^{17}\)

On the right hand side of the equation 2 we find a key parameter of the model which we will denote by $\Delta (\gamma) = R(H, \gamma) - R(D, \gamma)$. We can interpret $\Delta (\gamma)$ as the financial adviser’s expected profit difference when switching from dishonesty to honesty (without taking into account legal liabilities). Recall that we have assumed that $\Delta (\gamma)$ is negative for all values of $\gamma$ and by the supermodularity of the revenue functions it is increasing in $\gamma$. The next proposition characterizes the solution to the Court’s problem

**Proposition 2** For all $\gamma$, there exists a level of net expected profit difference when switching from honesty to dishonesty, $\Delta_{\text{min}} = (\Phi (\pi_{\text{min}}) - 1)L$, such that if $\Delta \geq \Delta_{\text{min}}$ then the optimal standard is $\bar{\pi}^*(\Delta) = \Phi_D^{-1} (1 + \frac{\Delta}{L})$ which is decreasing in $\Delta$. If $\Delta < \Delta_{\text{min}}$ the Court cannot induce an honesty policy.

The intuition of this proposition is as follows: for a given $\Delta (\gamma)$, there is a set of standards that generate enough incentives for honest behavior of advisers. As Type I error is monotonically

---

\(^{16}\)Although for completeness we provide a formal proof in the appendix, this result is known. This characterization was stated in Ganuza et al (2015) and can be also derived from Demougin and Fluet (2005, 2006).

\(^{17}\)This figure is generated using signals with the following linear information structure which satisfies MLRP:

\[
\begin{align*}
  f (\pi|H) &= 1 - \frac{\gamma}{2} + \gamma \pi, \quad F (\pi|H) = \pi - \frac{1}{2} \gamma \pi (1 - \pi), \\
  f (\pi|D) &= 1 + \frac{\gamma}{2} - \gamma \pi, \quad F (\pi|D) = \pi + \frac{1}{2} \gamma \pi (1 - \pi),
\end{align*}
\]

where $\gamma = 1.75$.

---
increasing in the evidentiary standard, the Court chooses the minimum of these standards. If the firm’s expected difference if switching from dishonesty to honesty increases, it becomes easier to induce good behavior, and the Court’s optimal standard decreases.

Figure 2 illustrates Proposition 2 by characterizing the optimal evidentiary standard when $p = 0.75$, and $\Delta' = -0.23$.

In Figure 2 we can observe the set of standards inducing honesty, $H(\Delta')$, and the optimal standard, $\pi^*$—the lowest in this set. A higher $\Delta$ (corresponding to higher green horizontal line at $\frac{\Delta}{L} = -0.2$), larger market incentives to be honest implies a more lenient optimal evidentiary standard, $\pi^{**}$. 

Figure 1: The weighted error function.
4 Investor information, sophistication and the optimal Court policy

The Court’s optimal evidentiary standard as characterized in Proposition 2 depends on the losses of the investors but also on the amount and quality of information available to investors and on their level of financial sophistication. An increase in transparency (the amount and quality of information available to investors parameterized by $\delta$) helps consumers to better distinguish between suitable and unsuitable investments. This, in turn, given the supermodularity of the revenue function, increases revenues for an honest adviser, and reduces revenue for the dishonest one, and thereby increases the profits from switching to a policy of honesty ($\Delta$ is higher). This translates into an increase in the adviser’s incentives for honesty—even in the absence of liability—and reduces the need for Court intervention. Then, Court rulings can be more lenient, and so the Court optimally applies lower evidentiary standards. A similar analysis applies if $\theta$, the level of
sophistication of the investor, increases.

**Proposition 3** The Court’s optimal evidentiary standard depends on the quality of information available to investors and their sophistication. Higher levels of adviser’s transparency and investor sophistication result in lower Court optimal liability standards.

Proposition 3 has been obtained under the assumption that there is a single type of adviser. Consequently, the Court objective is to provide enough incentives to be honest and minimizing as much as possible the possibility of Type I error. In Section 5 we extend our model to an heterogenous population of advisers, where for a given standard typically some advisers will be honest while other advisers would be dishonest. The Court will then choose a standard in order to maximize a social welfare function that it is likely to depend on Type I and Type II errors (since Type II error would arise in equilibrium). In such a more complex setting the main insights of Proposition 3 are still valid.

We must also notice a different simplification underlying our basic model: We have assumed that the revenue functions $R(H, \gamma)$ and $R(D, \gamma)$, are independent of the liability system in place, and in particular on the standard chosen by the Court. In other words, that the payments imposed over advisers do not translate into compensation to investors. In general, under private law remedies (but not under regulatory sanctions) it is likely that investors get some amount of compensation, and then their willingness to pay for the assets may be affected by the liability system in place. In other words, revenue functions may depend on the optimal liability standard $R(H, \gamma, \bar{\pi})$ and $R(D, \gamma, \bar{\pi})$. We discuss this in greater detail in Appendix B. This would complicate the analysis, but does not necessarily change our results.

4.1 Transparency and the quality of evidence

First, we have assumed that the evidence available to the Court, the informativeness of $\Pi$, is constant, and does not depend on the accuracy of the investor’s signal or, indirectly, on the
transparency level provided by the firm. Gauza at al (2015) shows that optimal standards are lower when the quality of evidence (informativeness of the signal held by the court) is higher. In our setting, this effect would lead to even further reductions in the optimal evidentiary standards when investors receive more accurate signals about the assets, which in turn happens when clients are more sophisticated and when the information that advisers provide to investors is more transparent.

Once we have rewritten the Court’s decision problem in terms of minimizing decision errors, this result becomes natural. If more transparency or more sophistication increase the quality of evidence before the Court, this implies less errors in imposing liability for any given standard. Then, the set of standards that satisfy the incentive compatibility constraint is larger and, consequently, the minimum of such set, the optimal one that minimizes type one error, is lower.

![Figure 3: Changing transparency and the quality of the Court’s information.](image)

To illustrate this, Figure 3 reproduces Figure 2 and includes what would happen to the error
function if the increase from $\Delta'/L = -0.23$ to $\Delta/L = -0.2$ (due to an increase in transparency) is accompanied by an increase in the quality of evidence before the Court. The new error function (the dashed line) is below the previous error function for all values of $\pi$, which implies that the previous optimal standard, $\pi^{**}$, is in the interior of the set of feasible standard with the new incentives, and consequently, the new optimal standard, $\hat{\pi}^{**}$, will be smaller than (to the left of) $\pi^{**}$, and even more so than $\pi^*$.

4.2 Endogenous transparency

Thus far, we have not considered that the investor’s level of sophistication and the transparency level of financial adviser may be choice variables. In reality, both are, subject to certain constraints and costs, within the ability of the adviser to choose or, at least, to influence.

Regarding transparency, it appears to be the case that the financial adviser may take many steps to enhance the amount, quality and transparency of the investment information it provides to its current or prospective clients. For instance, the firm providing investment services may prepare, in ways that are reasonably clear and accessible, and that also address some of the biases and shortcomings that investors may be shown to incur frequently, relevant information pertaining to a (larger or smaller) number of the investment products that are offered to various groups of investors. With the size, clarity, and quality of that information, the ability of investors to assess the suitability of financial products, even in the absence of investment advice explicitly or implicitly addressed to them, would increase, given the level of experience and sophistication of the investor. Obviously, these measures are costly, since they involve training of personnel, research, and time and effort in producing the information.

Customers’ degree of sophistication is also a variable that may be influenced by the financial adviser. First, because the target population of potential customers depends on the marketing

---

18In our parameterized example, the parameter $\gamma$ captures the informativeness of the signal, and the figure 3 captures an increase in $\gamma$ from a value of 1.75 to one of 2.10.
strategies used by the firm, and these may cater to different groups that vary in terms of their investment experience and sophistication. Second, because investment firms may engage in some educational efforts to expand the financial acumen of their clients. Third, and more importantly, the financial adviser may devote resources to try to “know its customers”. In fact, legal regulation of investment advice emphasizes firms’ duties in this matter. Art. 25.2 MiFID II Directive, determines that, “[w]hen providing investment advice or portfolio management the investment firm shall obtain the necessary information regarding the client’s or potential client’s knowledge and experience in the investment field relevant to the specific type of product or service, that person’s financial situation including his ability to bear losses, and his investment objectives including his risk tolerance [...].” By engaging in these efforts, the financial adviser would not only know better the level of sophistication of a given client before providing advice, but with the help of such knowledge, the firm may design the general investment information in a way that is better tailored to the profile of its client base, so that the perceptions that investors will derive from such information become more accurate, since they fit better with the investors’ level of sophistication.

Thus, in the world of our model, when firms may take costly measures to increase investors’ sophistication and informational transparency, they will trade off the cost of these measures against the benefits that will accrue to them in terms of lower liability standards to be applied in ex post litigation when investors incur losses. The more lenient liability standards applied to investment advisers with more sophisticated clients and who produce more transparent investment information do not only reduce the “penalty” on “good” financial advisers, they also provide incentives for firms to channel resources into increasing the level of sophistication of investors in their client base, and to produce information for their clients that allows them to better assess, without the help of the firms’ financial advice, the suitability of alternative investment instruments.
The basic model considers a single type of adviser. In this section we introduce heterogeneity across advisers in the form of a population of advisers with different reputational cost, $\beta$. These costs are distributed uniformly in an interval $[\beta, \beta]$. In such a case, typically, for a given standard, some advisers with high reputational cost $\beta$ would be honest while other advisers would be dishonest.\(^{19}\)

Suppose that the Court sets a standard $\pi$ for given $\gamma$. Then, there will be a marginal type, $\beta^*$, given by the solution to:

$$pT_I(\pi) + T_{II}(\pi) = 1 + \frac{R(H, \gamma) - R(D, \gamma, \beta^*)}{L}.$$ 

Using the resulting solution we obtain that advisers with higher reputational cost than

$$\beta^*(\pi, \gamma) = \frac{(\Phi(\pi) - 1)L}{\alpha} - (p^G(\gamma)r_A - p^B(\gamma)r_B)$$

would be honest, while the rest will be dishonest. Notice that $\beta^*(\pi, \gamma)$ is decreasing in $\pi$ and $\gamma$.

Then, the proportion of advisers who are honest, which we label as the compliance level $\eta$, is given by

$$\eta(\pi, \gamma) = \frac{\pi - \beta^*(\pi, \gamma)}{\beta - \beta},$$

which is increasing in $\gamma$. If the level of accuracy increases, the marginal type decreases and then there will be more compliance, a higher proportion of advisers are willing to follow an honesty policy.

The Court, when choosing a standard, will take into account its effect on the overall level of Type I and Type II errors as well as the general level of compliance. We capture the Court’s preferences over these variables using a social welfare function, $W(\eta, T_I, T_{II})$. Then, the Court will set its optimal standard, $\pi^*$, as the solution to the following problem:

$$\pi^* \in \arg\max W(\eta, T_I, T_{II}).$$

\(^{19}\)Advisers may also differ in other dimensions such as their degree of conflict of interest or the rents from the sale of each of the risky assets. A similar analysis would apply.
To address this problem, rather than give a specific functional form, we prefer to study a class of welfare functions with a set of plausible characteristics. Assume that $W$ is twice differentiable in its arguments. Let $W_i$ denote the derivative of $W$ with respect to its $i$-th argument, and $W_{ij}$ as the second derivative of $W$ with respect to its $i$-th and $j$-th argument. We assume that $W_1 > 0$ (welfare is increasing in compliance), $W_{11} < 0$ (concave), $W_2 < 0$ and $W_3 < 0$ (welfare is decreasing in $T_I$ and $T_{II}$), $W_{12} < 0$ and $W_{13} > 0$ (more compliance makes $T_I$ ($T_{II}$) more (less) socially costly).

For example

$$W(\eta, T_I, T_{II}) = \eta - \alpha_1(\eta) T_I - \alpha_2(\eta) T_{II},$$

where $\alpha_1(\eta)$ is increasing and $\alpha_2(\eta)$ is decreasing in compliance $\eta$. Such a welfare function will satisfy our properties: it is increasing and concave in compliance, decreasing in Court errors, and more (less) sensitive to Type I (Type II) error as compliance increases.

In addition, we assume that the relative social importance from a change in $T_I$ is everywhere greater than from a change in $T_{II}$.

$${p} \left| \frac{\partial W}{\partial T_I} \right| \geq \left| \frac{\partial W}{\partial T_{II}} \right|. \tag{3}$$

This assumption reflects the general fairness concern with the problem of convicting the innocent in legal discourse and practice ("it is better to let the crime of a guilty person go unpunished than to condemn an innocent").

With this assumption we can concentrate on the decreasing section of the $\Phi(\bar{\pi})$ weighted error function, as for two standards, $\bar{\pi}$ and $\bar{\pi}'$, that generate the same error, $\Phi(\bar{\pi}) = \Phi(\bar{\pi}')$, the one with the lower standard is preferred: $\bar{\pi} < \bar{\pi}' \Rightarrow W(\bar{\pi}) > W(\bar{\pi}')$.

From this, we can prove that amongst the relevant evidentiary standards (those that dominate other standards that generate the same errors), the compliance level $\eta(\bar{\pi}, \gamma) = \frac{\bar{\pi} - \bar{\beta}(\bar{\pi}, \gamma)}{\bar{\beta} - \bar{\beta}}$ is increasing in $\bar{\pi}$.
We can now write the social welfare function as a function of \((\pi, \gamma)\):

\[
f(\bar{\pi}, \gamma) = W(\eta(\pi, \gamma), T_I(\pi), T_{II}(\pi)),
\]

We can now prove that the social welfare function has a key property, namely, that \(f(\pi, \gamma)\) is submodular in \((\pi, \gamma)\):

\[
\frac{\partial^2 f(\pi, \gamma)}{\partial \pi \partial \gamma} = \eta_y(\pi, \gamma)[\eta_\pi(\pi, \gamma)W_{11} + T_I'(\pi)W_{12} + T_{II}'(\pi)W_{13}] < 0
\]

From this we can obtain the same result as in the baseline model, namely that the optimal standard \(\bar{\pi}^* \in \arg \max W(\eta, T_I, T_{II})\) is decreasing in \(\gamma\).

6 Implications and Conclusions

Financial advice, both explicit and implicit, is a pervasive phenomenon in the area of financial decision-making by individuals. Moreover, it is an activity subject to extensive regulation in terms of legal duties imposed on firms providing it: in the introductory section we mentioned the general legal duty to act honestly and in the best interest of clients, to which an extensive set of more detailed duties (information, disclosure, know-your-customer, etc.) are added in the current European legal scheme. These duties come with monetary liabilities attached to their infringement, and understanding how legal liabilities affect the behavior of financial advisers provides an obvious area of interest for economic approaches. For this, it is important to bear in mind that legal duties and liabilities, however, are not determined and implemented by all-knowledgeable lawmakers and adjudicators, but by legal institutions that only have incomplete information about the behavior of the regulated investment advisers.

Our model tries to shed light into precisely such an environment, where investors’ perceptions as to the suitability of financial instruments, the advice provided by the expert financial advisers, and the decisions by courts who impose liability ex post with only informative signals about the firms’ actual compliance with their legal duties, intersect. In this setting we provide an analysis
of how clients’ sophistication, and the transparency of general investment information from the firm should affect the stringency of the liability regime on financial advisers for the advice they provide. We believe our analysis is relevant for implementing the new MiFID II regime in a desirable economic fashion. But even beyond the boundaries of the set of duties for financial advisers under MiFID II, the implications of our model are relevant, we believe, for how the law deals with the provision of financial advice to investors by experts, be they explicitly framed as advice, personally addressed to a customer, or as a vaguer and less explicit “nudge” towards a given investment product. These more “subtle” or “covered” forms of implicit recommendation actually complicate the ex post observation by courts of the underlying adviser’s behavior, and thus may fall even more neatly within our framework.

The current analysis represents an additional step in the ongoing effort to clarify how various parameters involved in the interaction between investors and financial advisers should impact the implementation of the regulatory regimes, such as the one in MiFID II, or in other schemes intending to improve market outcomes in the area of investment services.

A Appendix

Proof of Lemma 1: We include this proof for completeness since it can be also found in Ganuza, Gomez and Penalva (2015). The values of $\Phi$ are obtained by direct computation while the existence and uniqueness of the minimum is obtained by looking at the derivative of $\Phi$:

$$\Phi'(\pi) = f(\pi|q_L)\left[p\frac{f(\pi|q_H)}{f(\pi|q_L)} - 1\right].$$

As the likelihood ratio integrates to one (with respect to $f(\pi|q_L)$) and is monotone, $\Phi$ has at most one sign change (from negative to positive). As the likelihood ratio is increasing it starts off negative so that the minimum of $\Phi$ is either in the interior of $[0,1]$ or at $\pi = 1$. Uniqueness comes from the differentiability of $f$.

Proof of Proposition 2:
The level $\Delta_{\text{min}}$ is determined as the solution to $\Phi(\pi_{\text{min}}) = 1 + \frac{\Delta_{\text{min}}}{D}$. In case of $\Delta < \Delta_{\text{min}}$, for all $\pi \in [0,1]$, $\Phi(\pi) > 1 + \frac{\Delta}{D}$ so that it is not possible to induce high quality. For $\Delta > \Delta_{\text{min}}$, let $H(\Delta)$ be the set of $\pi$ that satisfy the incentive compatibility constraint for a given $\Delta$. The set $H(\Delta)$ is a closed interval such that for all $\pi \in H(\Delta)$, $\Phi(\pi) < 1 + \frac{\Delta}{D}$, and the minimum of $H(\Delta)$ is $\Phi^{-1}_D(1 + \frac{\Delta}{D})$. As $\Phi_D$ is decreasing and $1 + \frac{\Delta}{D}$ is increasing in $\Delta$, $\Phi^{-1}_D$ is decreasing in $\Delta$.

**Proof of Proposition 3:** From Proposition 2 we know that the optimal standard $\bar{\pi}^*$ is decreasing in $\Delta$, and $\Delta(\delta,c) = R(q_H, \delta) - c - R(q_L, \delta)$ is increasing in $\delta$, which implies that $\bar{\pi}^*$ is decreasing in $\delta$.

**B Extension: Forward Looking Investors**

We were assuming that investors were myopic regarding the liability system, and revenue functions $R(H, \gamma)$ and $R(D, \gamma)$, are independent on the standard chosen by the Court. In other words, that the payments imposed on advisers do not translate directly into compensation to investors.

In general, under private law remedies (but not under regulatory sanctions) it is likely that investors get some amount of compensation, and then their willingness to pay for the financial assets may be affected by the liability system in place.

Revenue functions may depend on the optimal liability standard $R(H, \gamma, \bar{\pi})$ and $R(D, \gamma, \bar{\pi})$. This complicates the analysis, and it is likely to reduce incentives to follow a policy of honesty since $R(H, \gamma, \bar{\pi}) - R(D, \gamma, \bar{\pi})$ will be likely to be lower, but supermodularity of the revenue function is likely to hold and with it, our main insights.
References


C.1 Microfoundations: restricted investments, fixed types with full FA information

Consider the situation where the population is made up of sophisticated and unsophisticated investors. Let $\theta$ be the proportion of sophisticated investors and $1 - \theta$ that of unsophisticated investors. Also, suppose that initially the investor is only aware of the existence of the riskless asset, and will only become aware of the risky asset that the adviser recommends (and never know of the existence of the other risky asset).

The investors’ optimal action will depend on their type, defined by their level of sophistication. Assume the unsophisticated investors will follow the recommendation of the adviser. On the other hand, sophisticated investors will follow the given advice if it coincides with the signal they receive when they request advice.

Then, the expected revenues from honest and dishonest policies are

$$R(H, \gamma) = \alpha(\theta \gamma + (1 - \theta))r_1 + (1 - \alpha)(\theta \gamma + (1 - \theta))r_2$$

$$R(D, \gamma) = \alpha(\theta (1 - \gamma) + (1 - \theta))r_2 + (1 - \alpha)(\theta \gamma + (1 - \theta))r_2) - \alpha \beta.$$  

Then, the revenue difference between the two honesty policies is:

$$R(H, \gamma) - R(D, \gamma) = \alpha(\theta \gamma + (1 - \theta))r_1 - \alpha(\theta (1 - \gamma) + (1 - \theta))r_2 + \alpha \beta.$$  

Let

$$p^G(\gamma) = \theta \gamma + (1 - \theta), \quad p^B(\gamma) = \theta (1 - \gamma) + (1 - \theta),$$  

so that the difference can be rewritten as follows:

$$R(H, \gamma) - R(D, \gamma) = \alpha(p^G(\gamma, \theta)r_1 - p^B(\gamma, \theta)r_2 + \beta),$$  

where $p^G$ is increasing in $\gamma$ and $p^B$ is decreasing in $\gamma$. However, both are decreasing in $\theta$ and the
overall effect of an increase in $\theta$ may be negative:

$$\frac{\partial}{\partial \theta} R(H, \gamma) - R(D, \gamma) = \alpha((\gamma - 1)r_1 - ((1 - \gamma) - 1)r_2)$$

$$= \alpha(r_2 - (1 - \gamma)(r_1 + r_2))$$

\[C.2\] Microfoundations: restricted investments, Nash equilibrium with full FA information

Consider the situation where the population is made up of sophisticated and unsophisticated investors. Let $\theta$ be the proportion of sophisticated investors and $1 - \theta$ that of unsophisticated investors. Also, suppose that initially the investor is only aware of the existence of the riskless asset, and will only become aware of the risky asset that the adviser recommends (and never know of the existence of the other risky asset).

The investors’ optimal action will depend on their level of sophistication. Assume the unsophisticated investors will follow the recommendation of the adviser. On the other hand, in equilibrium the sophisticated investor will condition the interpretation on the FA’s optimal action and hence, will believe (and follow) the recommendation if in equilibrium the FA is honest, and will ignore the recommendation of the adviser if in equilibrium the FA is dishonest. Note, however, that the sophisticated investor obtains information just from visiting the adviser, namely, the investor learns of the existence of the risky asset and obtains the signal, $s$, with precision $\gamma$ regarding the expected return of the risky asset. With this information, if the adviser is being dishonest, the investor will compare the expected return from the recommended risky asset (after observing the signal) with the riskless asset. Let $q_i, i \in \{1, 2\}$, denote the posterior probability that the match with the recommended asset is good. This implies that the investor will invest in the risky asset only if:

$$0 \leq q_i (1 - p - pL) + (1 - q_i) (-L)$$

$$\iff \frac{q_i}{1 - q_i} \geq \frac{L}{1 - p(1 + L)} := \mathcal{L}.$$
The ratio of posterior expectations depends on both the informativeness of the signal, \( \gamma \), as well as the prior, \( \alpha \), namely:

\[
\frac{q_1}{1 - q_1} = \frac{\alpha \gamma}{(1 - \alpha)(1 - \gamma)}, \quad \frac{q_2}{1 - q_2} = \frac{(1 - \alpha)\gamma}{\alpha(1 - \gamma)}.
\]

To simplify the analysis, consider that \( \gamma \) is sufficiently high such that the sophisticated investor will choose the recommended asset if it the signal suggests it is a good match.

Then, the expected revenues from honest and dishonest policies are

\[
R(H, \gamma) = \alpha r_1 + (1 - \alpha)r_2
\]
\[
R(D, \gamma) = \alpha(\theta(1 - \gamma) + (1 - \theta))r_2 + (1 - \alpha)(\theta \gamma + (1 - \theta)r_2) - \alpha \beta.
\]

Consider the deviations: \( R(H, \gamma, d) \), the revenue from deviating from an honest policy, and \( R(D, \gamma, h) \), the revenue from deviating from a dishonest policy (where after observing \( s_1 \) out-of-equilibrium the sophisticated believes the FA is being honest):

\[
R(H, \gamma, d) = \alpha r_2 + (1 - \alpha)r_2 - \alpha \beta.
\]
\[
R(D, \gamma, h) = \alpha r_1 + (1 - \alpha)(\theta \gamma + (1 - \theta)r_2).
\]

Then, for honesty to be an equilibrium outcome we require

\[
R(H, \gamma) - R(H, \gamma, d) = \alpha(r_1 - r_2) + \alpha \beta \geq 0
\]
\[
\iff \beta \geq r_2 - r_1.
\]
\[
R(D, \gamma) - R(D, \gamma, h) = \alpha(\theta(1 - \gamma) + (1 - \theta))r_2 - \alpha r_1 - \alpha \beta \geq 0.
\]
\[
\iff \beta \leq (1 - \gamma \theta)r_2 - r_1.
\]

C.3 Microfoundations: unrestricted investments, partial FA information

Suppose the investor receives a private signal of the state, \( s \), with precision \( \gamma \). The adviser also receives a signal with precision \( \xi \). The adviser sends a message to the investor, \( m \). Suppose
that this message is equal to his signal with probability $h$ and equal to the adviser’s preferred asset with probability $1 - h$.

Notation: let $G_i$, $i \in \{1, 2\}$, denote the state where asset $i$ is a good match. Similarly, let $m_i$ and $s_i$ represent the events “the message sent by the FA is that asset $i$ is a good match” and “the signal received by the investor is that asset $i$ is a good match”.

**Unknown bias** Suppose the investor does not know which asset is preferred by the FA and assumes the FA prefers each asset with equal probability. Then the investor believes a dishonest message recommends assets 1 and 2 with equal probability. The posterior after observing $m_1$ is

$$
\Pr\{G_1|m_1\} = \frac{\Pr\{m_1|G_1\} \alpha}{\Pr\{m_1\}}
$$

$$
\Pr\{m_1|G_1\} = h \xi + (1 - h) \frac{1}{2}
$$

$$
\Pr\{m_1\} = h(\alpha \xi + (1 - \alpha)(1 - \xi)) + (1 - h) \frac{1}{2}
$$

$$
\Pr\{G_1|m_1\} = \frac{(h \xi + (1 - h) \frac{1}{2}) \alpha}{h(\alpha \xi + (1 - \alpha)(1 - \xi)) + (1 - h) \frac{1}{2}}
$$

$$
\frac{\Pr\{G_1|m_1\}}{1 - \Pr\{G_1|m_1\}} = \frac{\alpha(h \xi + (1 - h) \frac{1}{2})}{(1 - \alpha)(h(1 - \xi) + (1 - h) \frac{1}{2})}
$$

With unknown bias, the “precision” of the message is $h \xi + (1 - h) \frac{1}{2}$ which is directly comparable with the precision of the signal $\gamma$. Then, the investor would always follow the signal rather than the message if

$$
\gamma_i > h \xi + (1 - h) \frac{1}{2},
$$

and follow the message over the signal if the inequality is reversed. With $\xi = 1$, the inequality is

$$
\gamma_i > \frac{1 + h}{2}.
$$

**Known bias** Suppose that the investor knows that the FA prefers to sell asset 2. Then, the honest FA will communicate the message truthfully but the dishonest one will always recommend asset 2. If the investor observes $m_1$, then it comes from the truthful type for sure, and the precision of the signal is $\xi$. 

34
If the investor observes $m_2$, then the posterior is obtained as follows:

\[
\begin{align*}
\Pr\{m_2|G_2\} &= h\xi + (1-h) \\
\Pr\{m_2\} &= h((1-\alpha)\xi + \alpha(1-\xi)) + (1-h) \\
\Pr\{G_2|m_2\} &= \frac{(h\xi + (1-h))(1-\alpha)}{h(\alpha(1-\xi) + (1-\alpha)\xi) + (1-h)} \\
\frac{\Pr\{G_2|m_2\}}{1-\Pr\{G_2|m_2\}} &= \frac{(1-\alpha)(h\xi + (1-h))}{\alpha(h(1-\xi) + (1-h))} \\
&= \frac{(1-\alpha)\frac{h\xi + (1-h)}{2-h}}{\alpha(1-\frac{h\xi + (1-h)}{2-h})}
\end{align*}
\]

With known bias, the “precision” of the message depends on the bias. If the FA-preferred option is 2 then upon observing $m_1$ the investor would follow the signal if

\[\gamma_i > \xi,\]

that is, always if $\xi = 1$. While, upon observing $m_2$ the investor would follow the signal if

\[\gamma_i > \frac{h\xi + (1-h)}{2-h}.
\]

**The FA’s optimal action** To obtain a strategy where the FA mixes between being honest and dishonest we can appeal to two possibilities: (i) the FA is following a mixed strategy in a Nash Equilibrium [see section on Nash equilibrium with full FA information]; (ii) another possibility is that the FA is mixing in response to a random signal on the investor’s type ($\gamma_i$). A particular version of case (ii) is as follows: the FA receives a signal $\sigma$ that is informative about the investor’s level of sophistication. The following argument argues for the hypothesized supermodularity of the revenue function without reference to the exact informational content of the signal or whether we assume the FA’s bias is known or unknown.

Let $q(\sigma)$ be the FA’s posterior that the investor is unsophisticated (and will follow the FA’s advice) and $1 - q(\sigma)$ that the investor is sophisticated (and will ignore the message and follow $si$)–we obviate the $\sigma$ when it is inferable from the context. Let $\gamma_\xi = q\xi + (1-q)\gamma$, where $\gamma$ is the average precision on the parameter of sophisticated investors, so that $\gamma_1 = q + (1-q)\gamma$. The
expected revenues from honest and dishonest policies are

\begin{align*}
R(H, \gamma, \sigma) &= \alpha(\hat{\gamma}_\xi r_1 + (1 - \hat{\gamma}_\xi) r_2) + (1 - \alpha)((\hat{\gamma}_\xi r_2 + (1 - \hat{\gamma}_\xi) r_1)), \\
R(D, \gamma, \sigma) &= \alpha((\hat{\gamma}_1 - q) r_1 + (1 - \hat{\gamma}_1 + q) r_2) \\
&\quad + (1 - \alpha)(\hat{\gamma}_1 r_2 + (1 - \hat{\gamma}_1) r_1) \\
&\quad - (1 - \alpha)(1 - \xi) \beta - \alpha \xi \beta
\end{align*}

If \( \xi = 1 \), this simplifies as \( \hat{\gamma}_\xi = \hat{\gamma}_1 = q + (1 - q) \gamma \), so that:

\begin{align*}
R(H, \gamma, \sigma) &= \alpha(\hat{\gamma}_1 r_1 + (1 - \hat{\gamma}_1) r_2) + (1 - \alpha)(\hat{\gamma}_1 r_2 + (1 - \hat{\gamma}_1) r_1), \\
R(D, \gamma, \sigma) &= \alpha((\hat{\gamma}_1 - q) r_1 + (1 - \hat{\gamma}_1 + q) r_2) \\
&\quad + (1 - \alpha)(\hat{\gamma}_1 r_2 + (1 - \hat{\gamma}_1) r_1) - \alpha \beta.
\end{align*}

Let \( \Delta = r_2 - r_1 \). Depending on the value of the parameters, the difference may be positive or negative, and so will be the incentives of the financial adviser:

\[ R(H, \gamma, \sigma) - R(D, \gamma, \sigma) = \Delta ((1 - 2\alpha)(\hat{\gamma}_\xi - \hat{\gamma}_1) - \alpha q) \]

\[ + (1 - \alpha)(1 - \xi) \beta + \alpha \xi \beta. \]

Which, for \( \xi = 1 \), simplifies to:

\[ R(H, \gamma, \sigma) - R(D, \gamma, \sigma) = \alpha(\beta - q\Delta). \]

So that (with \( \xi = 1 \)) we can generically write

\[ R(H, \gamma, \sigma) - R(D, \gamma, \sigma) = \alpha(\beta + p^G(\gamma) r_1 - p^B(\gamma) r_2), \]

where \( p^G = p^B \).

It is natural to assume that the posterior probability \( q(\sigma) \) is decreasing in the distribution of \( \gamma \), and hence the revenue of the FA is supermodular in \( \gamma \) and honesty. The signal \( \sigma \) parametrizes the FA’s types. As long as \( \sigma \) is good news (in the sense of Milgrom) about the probability of
meeting a sophisticated investor, then the FA’s incentives to be honest will also be increasing in $\sigma$.

This will occur if higher types are more likely to ignore the message, and for this to be true one needs that the incentives for honesty of the adviser increase more rapidly than the investor’s level of sophistication.