# Judicial Decisions and Financial Advice. The Role of Transparency and Investor Sophistication.*

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### Abstract

Both before and after the financial crisis, the marketing and sale of financial products has given rise to serious concerns about the mis-selling of certain financial investments to customers. In many cases, this has led to important numbers of lawsuits filed against firms providing the investment services. In the paper we provide a simple agency model of financial advice -broadly understood- where potential clients receive a signal about the matching of the product with the investor's preferences, and at the same time receive advice about which product to buy. Even good financial products may generate losses, and this will lead to litigation 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 advisors to procure honest financial advice, and show how it depends on the accuracy of the market signal that investors receive, which in turn depends on the sophistication of the client and the overall amount and quality of information on financial products that advisors provide 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.

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# 1   INTRODUCTION

The financial crisis has generated substantial public concern with the functioning of financial markets. In developed economies this concern has been translated into important modifications of the legal and regulatory framework governing financial institutions and financial activities, especially in the EU, where substantial changes has been introduced into the legislative framework.

These changes have taken different forms. First, in view of the banking crisis affecting many EU (and non-EU) countries, regulation and supervision of financial institutions has been overhauled. In this area, the EU has introduced legislative measures dealing with several dimensions of financial institutions: (i) Basel III capital accords have been implemented in an effort to improve the capital requirements and the financial resilience of banks;[1] (ii) a single supervision mechanism for banks in the Eurozone has been introduced;[2] and (iii) a common European framework for recovery and resolution of credit institutions, as well as a single resolution mechanism has been established.[3]

Second, the inadequate functioning of the mortgage market was perceived as a major factor in the housing boom and bust in various economies (US, Ireland, Spain) and in the build up to the financial crisis. The reaction of the law-making powers in the EU has been the adoption of the Mortgage Credit Directive of 2014.[4] This directive introduces several measures in the market for credit secured by a mortgage. Amongst these, we find the specification and clarification of consumer rights, obligations by banks to carry out a creditworthiness assessment before granting credit, the development of effective underwriting standards, and certain prudential and supervisory requirements for credit intermediaries.[5]

Third, the marketing and sale of financial products and instruments to retail investors has been called into question in several countries, specially in those where egregious instances of mis-selling of certain financial investments to consumers have been brought to light.

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[1]Directive 2013/36/EU (CRD IV), and .Regulation 575/2013/EU (CRR).
[2]Regulation 1024/2013/EU (SSM), and Regulation 1022/2013/EU (EBA)
[3]Directive 2014/59/EU (BRRD) and Regulation 806/2014/EU (SRM).
[4]Directive 2014/17/EU (MCD).
[5]On the MCD and mortgage credit more generally, see Ganuza and Gomez (2018).

Two of these countries have been Italy and Spain. In the first, 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.[6]

In Spain, the "preferentes" saga very well illustrates the deficiencies in the sale of financial instruments to retail investors.[7] "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 institutions made heavy use of them to obtain funds that were later channeled into the housing market in the form of mortgage credit to the construction sector and to households.

When the financial crisis erupted, things got worse. As liquidity dried up, 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 (as 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[8] 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

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[6]See, Enriques and Gargantini (2017).
[7]See, Santos (2017).
[8]Comisión de Seguimiento de Instrumentos Híbridos de Capital y Deuda Subordinada (2015).

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).[9] 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.[10] Despite these ADR mechanisms, the number of cases that have ended up in court is, reportedly, very high.

These cases did not arise in a legal and regulatory vacuum. 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,[11] and especially, with retail investors. In addition, on 3 January 2018 a new and ambitious legislative scheme has entered into force, the MiFID II framework.[12] 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 the stable functioning of financial markets. Both goals -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

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[9]Comisión de Seguimiento de Instrumentos Híbridos de Capital y Deuda Subordinada (2015).

[10]See on the details of the schemes both in Italy and Spain, Della Negra (2014).

[11]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).

[12]See generally on MiFID II, Busch and Ferrarini (2017).

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[13] 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.[14] As a result, there are incentives for compliance with the established duties arising from legal liabilities that will be determined or at least reviewed, by courts who will need to make an assessment of the behavior of the firm in the provision of investment services to its clients.

One of the actions by investment firms that seems to be more relevant for triggering legal duties and liabilities is 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 not to explore the boundaries of a more or less narrow legal notion of what qualifies as investment advice under MiFID II, but to explore the role of transparency and related factors surrounding "financial advice" in an abstract setting. 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

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[13]Art. 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."

[14]The European Court of Justice, in the Genil or Bankinter case (C-604/11, 30 May 2013) not only allows for contractual remedies based on the infringement of MiFID duties, but also determines that Member States are bound by obligations of equivalence and effectiveness in setting non-regulatory remedies for the infringement of such duties.

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.

In this paper we provide a simple model of financial advice given by firms 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 advisor, 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 advisor, 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 improve the accuracy of the signals that investors get about alternative investment products. 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 signal that investors receive on 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 advisor. 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.[15]

Thus, the result of our model is that the level of stringency of court-imposed liability on financial advisors 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 information transparency of the advisor. 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 signal received by the client and, consequently, on the revenue function of the financial advisor.

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[15]Inderst and Ottaviani (2009, 2010, 2012 a, 2012b, 2012c), although without an ex-post imperfect liability system in place.

The positive effect of client sophistication on the leniency of expected liability for the advisor would tend to counteract the incentive of investment firm 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 advisor.[16]

A similar aproach is used by us in a related project in a setting of quality effort of manufactorers amd product liability (Artigot et al 2017).

Previous economically oriented literature has dealt theoretically with financial advice provided by firms to potential customers, and how conflict of interest and several regulatory policies may affect the quality of advice and consumer and total welfare: Inderst and Ottaviani (2009, 2010, 2012a, 2012b, 2012c, 2013), Bolton, Freixas and Shapiro (2007), Gennaioli, Shleifer and Vishny (2015).

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 advisors 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 advisor'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.

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[16]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 advisors to target naïve investors: Inderst and Ottaviani (2012c, 2013).

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 advisor's general investment information. Section 5 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 advisor (a financial institution, or, more generally, a firm) who sells assets and provides recommendations to an investor and potential client. The investor has access to 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

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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 advisor knows how the asset matches with the investor, and decides to recommend either $S_1$ or $S_2$. The investor, in turn, perceives a signal about the products that are offered, and the probability of buying a given asset depends on the match between the investor and the asset and also on a parameter, $\gamma$, that denotes the accuracy of the signal received by the investor. Higher accuracy of the signal perceived by the investor enhances the probability of buying the asset that is a good match over that of buying the product that badly matches the investor's preferences. Thus, $p^G(\gamma) > p^B(\gamma)$. With a complementary probability the investor decides to buy the riskless asset $S$. Note that (for simplicity) we are assuming that the client will never purchase a risky asset that is not the one recommended by the advisor. The client will either buy the recommended risky asset or the riskless one, but not the other risky asset. This is a reasonable assumption, as a recommendation to buy $S_1$ is most likely to come from honest advice and hence is associated with a good match, while a recommendation to buy $S_2$ will come from honest advice most of the time and hence buying $S_1$ after receiving a recommendation to buy $S_2$ is more likely to be associated with a bad match and hence a large loss which will be worse than the zero return from the riskless asset.

The accuracy parameter $\gamma(\theta, \delta)$ is an increasing function of the level of sophistication of the investor, $\theta$, and the amount of information and level of transparency in the information provided by the advisor, $\delta$. 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

$$p^G(\gamma) = \frac{1}{2} + \gamma \text{ and } p^B(\gamma) = \frac{1}{2} - \gamma$$

In a nutshell, the accuracy of the signal about the financial product that the investor perceives

increases with the degree of experience or sophistication that the investor possesses on financial matters, and also with the amount, clarity and transparency of the information available on the products or assets that the financial advisor is offering (the level of transparency of the advisor).

An additional issue is how aligned the interests of advisor and investor are. With probability $1 - \alpha$ the incentives of the financial advisor 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 advisor 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 advisor incurs a moral or reputational cost $\beta$.

Then, the expected revenues for the financial advisor from honest and dishonest policies are $R(H, \gamma) = (1 - \alpha)p^G(\gamma)r_{S_2} + \alpha p^G(\gamma)r_{S_1}$ and $R(D, \gamma) = (1 - \alpha)p^G(\gamma)r_{S_2} + \alpha(p^B(\gamma)r_{S_2} - \beta)$, respectively.

Depending on the value of the parameters, the difference may be positive or negative and so are the incentives of the financial advisor:

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

It is important to analyze how this difference between both revenue functions depends on the accuracy variable $\gamma$ 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 that better general investors' signals make it more likely that it is optimal for the advisor to follow a policy of honesty.

Regardless of the advisor's behavior, we assume the investor will bring a case before the Court whenever she suffers a loss.[17] 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.

The Court then rules whether the financial advisor has to pay an amount $L$ to the investor (if there has been misbehavior that this the advisor 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 advisor, $\delta$, (the investor can be ex post assesed 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 advisor'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 advisor, 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 $[0, 1]$.[18] 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

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[17]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 advisor's duties (such as that of acting honestly, fairly, and in the best interest of the client, as is required in MIFID II).

[18]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.

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 $\pi$.

## 2.3 The Court's decision problem

The Court wishes to provide incentives to financial advisors to be honest. We also assume that the Court is concerned with penalizing honest advisors. This is a natural assumption since, as we will see below, finding liable an innocent advisor is the only error that can 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 advisor liable.[19]

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

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

We focus on the interesting case where it is not in the financial advisor'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

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[19]The assumption that the Court uses a threshold rule is harmless, as Ganuza 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 legar 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.

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 advisor, one who is actually "innocent". When the Court uses a standard $\bar{\pi}$, this probability is $F(\bar{\pi}|H)$. Minimizing Type I error is then equivalent to minimizing the expected liability of honest advisors. Similarly, the probability that the Court mistakenly acquits an unworthy advisor (Type II error), is $1 - F(\bar{\pi}|q_L)$. The Court's problem can be written as:

$$\min_{\bar{\pi}} p\, F(\bar{\pi}|H) \quad \text{subject to (IC).} \tag{1}$$

### 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 advisor 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 losses, a lawsuit is filed, and the advisor may be forced to pay damages according to the realized evidence and the Court's decision rule.

## 3 THE EQUILIBRIUM

### 3.1 Minimizing errors, maximizing incentives

We use the notation $\mathbb{T}_I(\bar{\pi}) = F(\bar{\pi}|H)$ to denote the Type I errors committed by a Court that imperfectly observes the advisor's actions and uses an evidentiary standard $\bar{\pi}$. Similarly, Type II

errors occur with probability $\mathbb{T}_{II}(\bar{\pi}) = 1 - F(\bar{\pi}|D)$. The Court's problem, on Equation (1), is equivalent to the following, more convenient, error minimization problem[20]:

$$\min_{\bar{\pi}} \mathbb{T}_I(\bar{\pi})$$
$$\text{s.t.} \quad p\mathbb{T}_I(\bar{\pi}) + \mathbb{T}_{II}(\bar{\pi}) \leq 1 + \frac{R(H,\gamma) - R(D,\gamma)}{L}. \tag{2}$$

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 $\Phi(\bar{\pi}) = p\mathbb{T}_I(\bar{\pi}) + \mathbb{T}_{II}(\bar{\pi})$. 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 $\pi_{\min}$. The function takes values $\Phi(0) = 1$ and $\Phi(1) = p$.*[21]

Let $\Phi_{\mathbb{D}}$ be the error function defined on the set $\mathbb{D} = [0, \pi_{\min}]$, so that $\Phi_{\mathbb{D}}$ 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 $\pi_{\min}$, the interval $\mathbb{D}$, and the function $\Phi_{\mathbb{D}}$.[22]

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 advisor'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

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[20] This method was proposed by Ganuza et al (2015a).

[21] 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).

[22] This figure is generated using signals with the following linear information structure which satisfies MLRP:

$$f(\pi|H) = 1 - \frac{\gamma}{2} + \gamma\pi, \quad F(\pi|H) = \pi - \frac{1}{2}\gamma\pi(1-\pi),$$
$$f(\pi|D) = 1 + \frac{\gamma}{2} - \gamma\pi, \quad F(\pi|D) = \pi + \frac{1}{2}\gamma\pi(1-\pi),$$
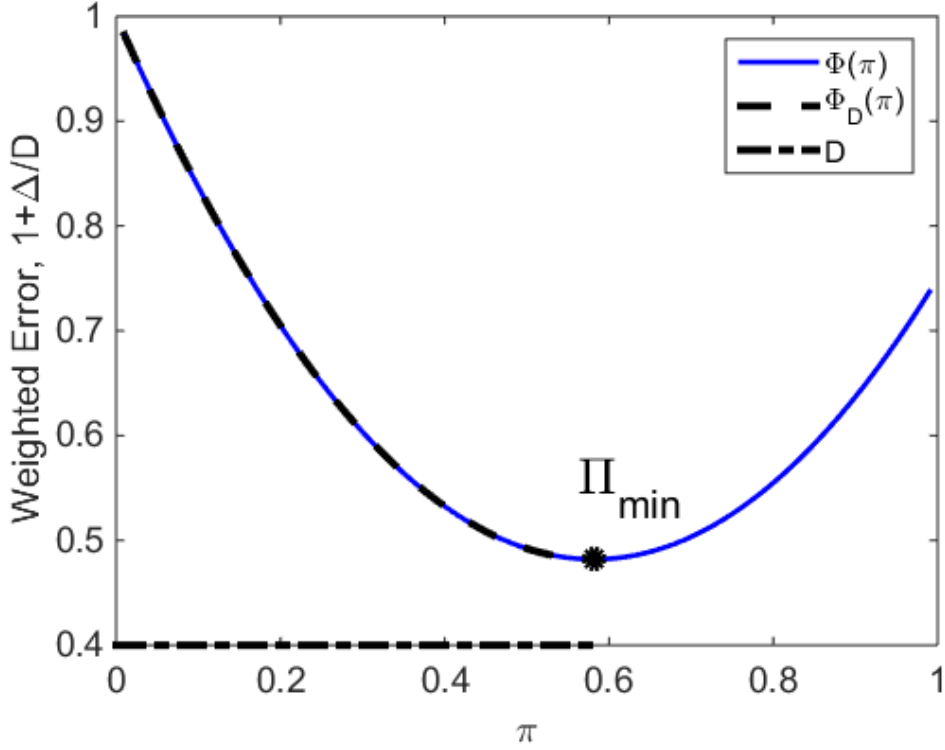
where $\gamma = 1.75$).

Figure 1: The weighted error function.

PROPOSITION 1 *For all $\gamma$, there exists a level of net expected profit difference when switching from honesty to dishonesty, $\Delta_{\min} = (\Phi(\pi_{\min}) - 1)L$, such that if $\Delta \geq \Delta_{\min}$ then the optimal standard is $\bar{\pi}^*(\Delta) = \Phi_{\mathbb{D}}^{-1}\left(1 + \frac{\Delta}{L}\right)$ which is decreasing in $\Delta$. If $\Delta < \Delta_{\min}$ 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 generates enough incentives for honest behavior of advisors. As Type I error is monotonically 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 1 by characterizing the optimal evidentiary standard when $p = 0,75$, and $\frac{\Delta'}{D} = -0.23$.
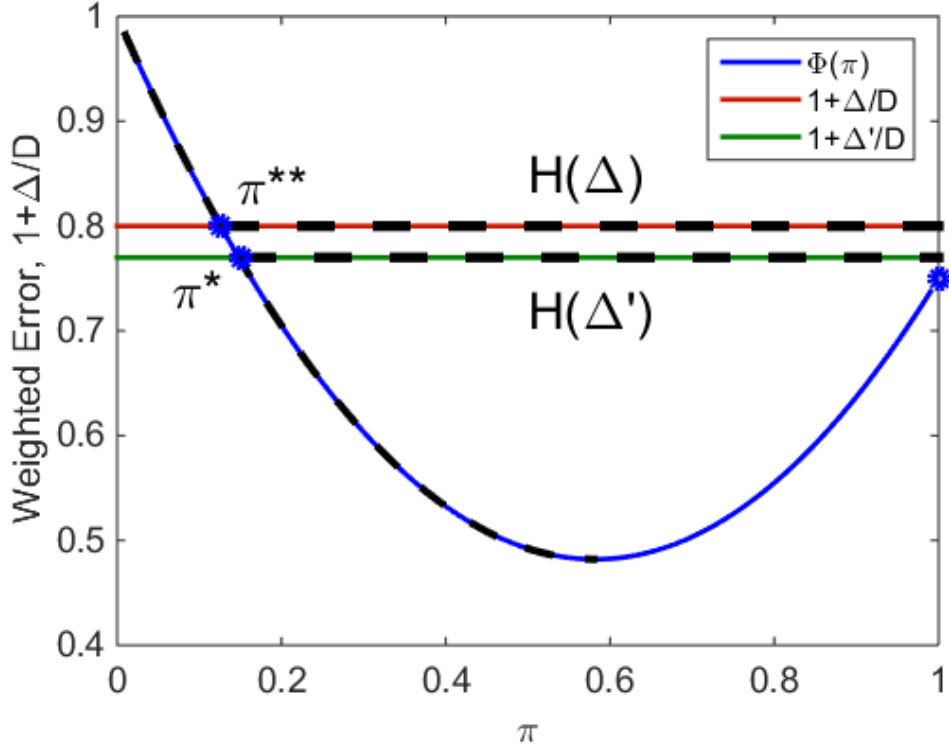
Figure 2: Changing transparency ($\Delta$).

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

## 4  INVESTOR INFORMATION, SOPHISTICATION AND THE OPTIMAL COURT POLICY

The Court's optimal evidentiary standard as characterized in Proposition 1 depends on the losses of the investors but also on the amount and quality of information available to investors and also 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 investment. This, in turn, given the supermodularity of the

revenue function, increases revenues for an honest advisor, 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 advisor'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 2 *The Court's optimal evidentiary standard depends on the quality of information available to investors and their sophistication. Higher levels of advisor's transparency and investor sophistication result in lower Court optimal liability standards.*

Proposition 2 has been obtained under several simplifying assumptions and we would like to discuss two important ones. Firstly, we have assumed that there is a single type of advisor. Consequently, the Court objective is to provide enough incentives to be honest and minimizing as much as possible the possibility of Type I error. To extend our model to an heterogenous population of advisors is not trivial. In such a case, typically, for a given standard, some advisors with high reputational cost $\beta$ would be honest while other advisors would be dishonest.[23] Court would 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) as well as the general level of compliance (proportion of honest advisors). The problem becomes complex since there is no clear way to specify the particular functional form of this objective function and, consequently, the relative weight of these factors (that would determine the optimal standard). Although we do not undertake such analysis, the driving forces of Proposition 2 are present in this more general setting and, in some way they are even reinforced. Let $\bar{\pi}'$ be the optimal standard for a population of advisors with a level of accuracy $\gamma'$. Then, as we said above, there will be a marginal type $0 = L(1 - p\mathbb{T}_I(\bar{\pi}') - \mathbb{T}_{II}(\bar{\pi}')) + R(H, \gamma') - R(D, \gamma', \beta^*)$ such that advisors with

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[23]Advisors 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.

higher reputational cost would be honest, while the rest will be dishonest. Then, if the level of accuracy increases, the marginal type decreases and then there will be more compliance, a higher proportion of advisors are willing to follow an honest policy. This could increase the weight of Type I error in the objective function, which combined with a softer incentive compatibility constraint for the previous argument, may make less stringent standards more appealing.

Another important simplification of the previous model is that 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 advisors 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 $R(D, \gamma, \bar{\pi})$. This would complicate the analysis, but it 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. Ganuza 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 advisors 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 stan-

dard. 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.
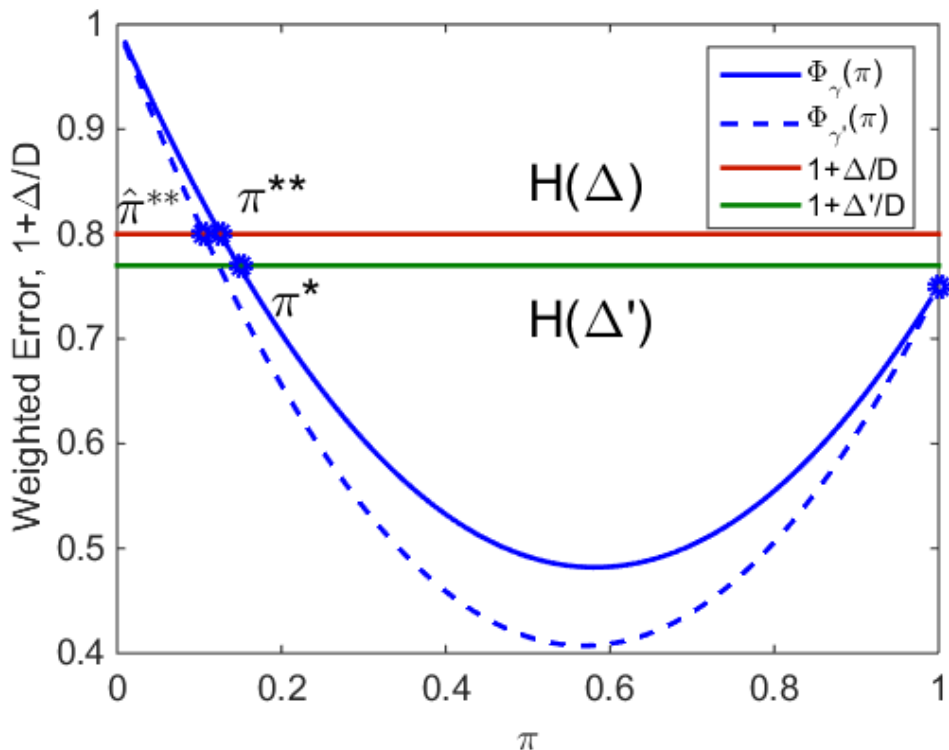


Figure 3: Changing transparency and the quality of the Court's information.

To illustrate this, Figure 3 reproduces Figure 2 and includes what would happen to the error function if the increase from $\Delta'/D = -0.23$ to $\Delta/D = -0.2$ (due to an increase in transparency) is accompanied by an increase in the quality of evidence before the Court.[24] 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, $\widehat{\pi}^{**}$, will be smaller than (to the left of) $\pi^{**}$, and even more so than $\pi^*$.

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[24]In 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.

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

Regarding transparency, it appears to be the case that the financial advisor 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, transparency 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 advisor. First, because the target population of potential customers depends on the marketing 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 advisor may devote resources to try to "know their 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 advisor 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 signals that investors receive 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 advisors with more sophisticated clients and who produce more transparent investment information do not only reduce the "penalty" on "good" financial advisors, 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.

## 5   Implications and Conclusions

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 markets decisions. And the usage of financial advice seems to be positively correlated with financial experience and sophistication: the wealthier, better educated, more financially literate investors contact advisors more often before taking investment decisions.[25] However, this does not imply that "only" financial advice is relevant for investors' decision making. Investors, especially more sophisticated ones, are not "helpless", or at least rely also on other "signals" than the advice specifically addressed to them. Financial sophistication of

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[25]Bucher-Koenen and Koenen (2015).

investors increases the likelihood of receiving advice, but reduces the likelihood of following the advice, and purchasing the products recommended by the advisor: Bhattacharya et al (2011).

Still, financial advice remains extremely important and, in any case, it is actually subject to extensive regulation in terms of legal duties imposed on firms providing it. In the introduction we have 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 regulatory scheme. The 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 advisors.

Our model tries to shed light into precisely such an environment, where investors' signals as to the suitability of financial instruments, the advice provided by the expert financial advisors, 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 advisors 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 advisors 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 advisor's behavior, and thus may fall even more neatly within our framework.

It goes without saying, this is just a first step in an ongoing effort to clarify how various parameters involved in the interaction between investors and financial advisors 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 $\Phi$:

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

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 1:

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

PROOF OF PROPOSITION 2: From Proposition 1 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 $\delta$. ∎

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