Research Article

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Duty to Read vs Duty to Disclose Fine Print. Does the Market Structure Matter?

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Abstract: Firms use standard contracts and possibly include unfavorable fine print which consumers may read at some positive cost. We propose a comparison between a monopoly and a perfect competition market under (1) an unregulated legal regime (duty to read) and (2) a regulation that mandates clause disclosure (duty to disclose). If consumers bear the duty to read contract terms, regardless of market structure, sellers disclose in equilibrium only if it is cheaper than reading for consumers. Conversely, if sellers bear the duty to disclose contract terms, then such regulation is never welfare improving in either market; it may turn out to be consumer protective only if there are several sellers, whereas it is uneffective on this regard in a monopoly.

Keywords: fine print, market structure, disclosure, reading cost, regulation

JEL Classification: D40, K12, K20, L11

1 Introduction

Suppose we are on holiday and decide to rent a car. At the car rental agency or on its website we select the car that fits our needs. Thereafter we are presented with

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a long contract of many pages - including information about liability, insurance, deposit, and other aspects of the car and its functioning – in which most of the clauses are written in fine print. We have time and will to read every clause finding that we do not like some of them. However, the rental agent explains that the contract is pre-printed and non-modifiable: we can simply accept it as it is or reject. This is a contract with standard clauses. Suppose now that we have no time or will to read the terms. Nevertheless, we can decide to sign the contract and to be binded to all its terms: indeed, contracts are enforceable when all parties knowingly consent, but knowledgeable consent is sufficient, rather than necessary for enforceability.

Contracts with standard clauses are used in many different industries, like property leases, mortgages, insurance, car purchases and so on. The use of standard clauses has become widespread among international businesses because they ensure quick transactions without long negotiation. Consumers typically do not read standard form contracts, especially clauses written in fine print, so that their signatures do not necessarily imply that their consent is knowledgeable.[1] As a result, a large consensus has grown up in the last decades among lawyers and economists that the general principle of freedom of contract must be limited in order to protect consumers against evidently unfair and non-negotiated clauses.

A first question to be addressed by legislators is *when* to intervene. In this regard, two alarm bells have been recognized, both emphasizing the contractual gap between parties: the market power and consumers' bounded rationality (Kessler 1943; Korobkin 2003). On the one hand, Kessler (1943) argues that monopolists can exploit their market power by offering contracts containing unfavorable clauses which consumers may not understand and cannot renegotiate.[2] While Kessler (1943) does not discuss regulation, his argument suggests that courts should be more prone to strike down standard form contracts drafted by a monopolist.[3] On the other hand, Korobkin (2003) advises that having consumers who are aware of, and in turn read, the content of the contract they are signing is

1 See Marotta-Wurgler (2008; 2012) and Bakos, Marotta-Wurgler, and Trossen (2014) on infrequent reading.

2 More recent versions of this approach include Kornhauser (1976) who claims that oligopolists would agree to draft onerous terms to facilitate price-fixing, and Shapiro (1995) who argues that competition would protect consumers from exploitation.

3 Some courts have used market structure as a criterion for treating terms as procedurally unconscionable (and therefore unenforceable), notably in *Henningsen v Bloomfield Motors* (NJ 1960). Recent cases include *Pack* v. *Damon Corp* (E.D. Mich 2004) and *Flores* v. *Transamerica HomeFirst Inc*. (Cal. Ct. App. 2001). According to J. Easterbrook, "Competition among vendors . . . is how consumers are protected in a market" in *ProCD* v. *Zeidenberg* 105 F.3d 1147 (7th Circ. 1997).

not enough, as they also have to use this relevant information for their purchase decisions. In this paper we focus on the first case, i.e. the market power, and compare a monopoly and a market with several identical sellers, both populated by a unit mass of fully rational consumers.

A second question legislators have to deal with is *how* to intervene. In order to protect consumers from sellers' incentive to insert opportunistic (and hence inefficient) contract terms, some legal systems (as the US regime) opted for a regulation based on clause disclosure, whereas others (such as the EU system) preferred a regulation on clause content. In this paper we focus on the first type of regulation in which seller(s) are forced to disclose their clauses showing its effects both in terms of consumers' protection and market efficiency: assuming that consumers are all rational and able to understand disclosure, we show that irrespective of market structure a "mandatory disclosure regime" is never welfare-improving, whereas the effects on consumers' utility may depend on market structure in an opposite way than that suggested by Kessler (1943), with consumers sometimes gaining from disclosure only in markets with several sellers.

We propose a model in which market structure is proxied by the number of sellers, and each consumer matches with only one seller. Seller(s) offer a non-negotiable contract containing a freely observable clause on price and a non-price clause which can be either favorable or unfavorable to consumers. Favorable clauses are more expensive to produce for seller(s), e.g. they may contain extensive warranties, but preferred by consumers over unfavorable clauses. Seller(s) also decide whether to pay the disclosing cost to make these clauses free to read or to shroud them in fine print that consumers can read at some positive cost. Assuming that trade on favorable clauses is socially efficient, we find that unregulated seller(s) always disclose and offer favorable clauses irrespective of the market structure. These results hold true only if disclosing is cheaper than reading or if reading is too expensive, whereas seller(s) do not disclose and mix between favorable and unfavorable clauses otherwise. Conversely, market structure does affect the equilibrium price that is higher in a monopoly than in a market with several sellers.[4]

We compare these results with equilibria characterizing the two markets if courts/laws mandate clause disclosure. We find that mandatory disclosure cannot increase, but can only reduce welfare in both markets because regulated seller(s) would be forced to disclose even when it is not efficient (viz. the disclosing cost is higher than the reading cost borne by consumers). Consumers are not protected in a monopoly because the regulated seller will raise the price up to consumers'

4 This result is consistent with Marotta-Wurgler's (2008) evidence (see Section 4.2).

reservation level for a favorable contract. Conversely, and in further contrast to Kessler (1943), we prove that competition among sellers may be beneficial for consumers when a mandatory disclosure regime comes into force: sellers are forced to charge a price no higher than costs, but whether disclosure has a positive effect on consumers' payoff crucially depends on how expensive disclosure (and therefore the price for a disclosed contract) is compared to the price charged for a non-disclosed contract possibly hiding unfavorable clauses. Precisely, we find that as the number of sellers decreases (viz. in oligopolies), it is more likely that competition is necessary but not sufficient to protect consumers, so that a mandatory disclosure regime may turn out to be beneficial. Conversely, a mandatory disclosure regime is more likely to be ineffective or even dangerous in the opposite case (viz. when the number of sellers is high), proving that a market characterized by a high level of competition properly works on its own in favor of consumers.

The paper is organized as follows. Section 2 reviews the existing literature and highlights the main contribution of our paper. Section 3 illustrates the model assumptions and specifies the solution concept. Section 4 presents and discusses the results respectively for a monopoly and a competitive market. Section 5 focuses on the implications of mandatory disclosure in a comparison with the previous literature. Section 6 discusses the main assumptions we used and gives some predictions on how changing them might affect our results. Section 7 concludes.

2 Literature Review and Contribution

The main reference to our paper is D'Agostino and Seidmann (2016). In their model a monopolist drafts a contract choosing the price and whether to make it simple or complex. A simple contract contains default clauses, whereas in complex contracts the monopolist can change clauses making them either more favorable or onerous for consumers who have to pay a cost to read them. Authors find that in an unregulated market trade occurs in simple contracts if the reading cost is very large; otherwise, the monopolist offers complex contracts mixing between favorable and onerous clauses and consumers mix between reading and accepting. They consider the effects of some regulations either imposing favorable clauses or prohibiting onerous clauses, showing that the latter may reduce welfare, harming (possibly naive) consumers.

Despite the similarities in the construction and in the solution concept of the model (including a refinement to reduce multiplicity of equilibria), our paper differs significantly in the research question and in some key assumptions. First, D'Agostino and Seidmann (2016) limit the analysis to a monopoly, whereas a comparison across different markets is the core of our paper. Second, they look at heterogeneous consumers, some of which may be naive, whereas we limit our analysis to rational consumers, and only include naive consumers in an extension. Last but not least, they do not allow the monopolist to disclose, but to offer default clauses in simple contracts without fine print.

Disclosure is indeed the leitmotiv of our paper. According to Ben-Shahar and Schneider (2011), contract disclosure to be effective should be able to give consumers easy access to every clause without paying the related reading cost. This raises two underlying, and potentially conflicting, rationales in regulating contract clauses: Section 218 of the Uniform Commercial Code states that a clause is unenforceable if a consumer would not have traded had he known its contents, which suggests that only naive consumers should be protected.[5] Conversely, some courts, notably in Henningsen v Bloomfield Motors (NJ 1960), have cited market power as an aggravating factor which suggests that all consumers should be protected.[6]

Consumer naivety is rather fundamental in Gabaix and Laibson (2006) who focus on a competitive market with sophisticated and myopic buyers, where only the former category takes into account the add-on price, if shrouded, and just a fraction of the latter category[7] becomes sophisticated, if firms unshroud. If add-ons are shrouded (resp. unshrouded), sophisticated buyers (resp. sophisticated buyers and informed myopes) also set the effort level to take add-ons away from future use in case they will decide not to buy them. Then, they take their purchasing decision. Gabaix and Laibson (2006) find that disclosure of add-ons arises in equilibrium only when a high enough proportion of consumers is rational: the intuition is that sellers are not able to attract buyers because an educated buyer, having enough knowledge to exploit the cheap price for the base good by substituting away add-ons from future use, prefers buying from those sellers who shroud add-on prices. In the equilibrium without disclosure sellers tend to set a very low price for the base good and a monopoly price for add-ons which becomes the main source of profit and balances in turn eventual losses coming from the low price offered for the base good.

Similarly, Ellison (2005) proposes a competitive game comparing an add-on model in which sellers offer a price for a base good and a price for add-ons, where the last one is not observable to consumers unless sellers disclose, and a standard price-discrimination model in which consumers observe both prices. The

5 See Eisenberg (1995), Korobkin (2003) and Gabaix and Laibson (2006). For the special case of cellular phone service market, see Grubb (2015).

6 See Beales, Craswell, and Salop (1981) and Beale (2007).

7 Gabaix and Laibson (2006) distinguish between informed and non-informed naives.

author concludes that "add-on practices can raise equilibrium profits by creating an adverse selection problem that makes price-cutting unappealing" (pag. 585). Ellison (2005) also mentions consumer naivety as one of the main reason to use hidden add-on prices sketching how this could affect the main results without providing a detailed proof.

Two crucial elements differentiate our paper from the literature on add-ons. First, the contract setting is different: in fact, we consider contracts with standard clauses, not add-on goods. This means that in our model buyers do not face a price for the main good and a price for other clauses, but only one comprehensive price. Second, we allow consumers to know the contract content by reading even if sellers do not disclose, whereas in Gabaix and Laibson (2006) and in Ellison (2005) sellers must disclose to allow buyers to know the add-on price. Nevertheless, some similarities certainly apply. Buyers protect themselves from a very high unknown price for add-ons by paying a substitution effort in Gabaix and Laibson (2006): in fact, this cost plays a similar role to our reading cost, since it allows sellers to make positive payoffs in non-disclosure equilibria.

We have decided not to include naive consumers in the main model as we believe the most interesting feature in contracts of adhesion is to understand whether sellers have an interest to disclose terms and, if not, whether consumers read terms even if reading is costly. However, for the sake of completeness we include consumer naivety in an extension, proving that contract disclosure turns out to be protective only for those who understand disclosure and become informed. Conversely, those who remain naive lose from mandatory disclosure in both markets.

Other models focusing on standard clauses assume that consumers are sophisticated: Katz (1990) and Che and Choi (2009) compare a duty to speak (viz. to disclose) and a duty to read regimes in a monopoly and in a competitive market with sophisticated consumers, respectively. Katz (1990) shows that a monopolist inefficiently offers the worst feasible clauses, and consumers holding heterogeneous preferences on quality never read because the monopolist could calibrate clauses, such that a reading consumer never strictly prefers to accept. This is generically impossible in our model, where there is a finite number of feasible clauses and consumers hold the same preferences on quality. Hence, favorable contracts can be offered (with a positive probability) in equilibrium. Katz (1990) does not explore the effect of favorable contracts on consumers' utilities; he rather considers a family of regulations showing that no limits should be imposed to a disclosing seller (viz. when speaking is cheap enough), and that imposing a given clause quality is socially preferable to an unlimited duty to read when the seller remains silent (viz. when speaking is expensive). As in Katz (1990), and contrary to our model, also in Che and Choi (2009) consumers hold heterogeneous tastes on quality; moreover, they must pay a (reduced) cost to read even if sellers disclose (whereas we assume perfect disclosure). They argue that in equilibrium unregulated sellers separate into two different categories: (1) those who offer favorable clauses with a high probability without disclosing, and (2) those who always disclose and offer onerous clauses: we rather prove that no seller discloses.[8] From a policy perspective, authors find that no legal regime welfare dominates, but a duty to disclose is socially preferable whenever the related cost is cheap enough. Moreover, they find that mandatory disclosure turns out to be consumer protective if enough customers care about clause quality. Our results partially confirm Katz (1990) and Che and Choi's (2009) conclusions about the effect of mandatory disclosure on social welfare, but are quite different about the effects on consumers' payoffs. More importantly, none of the mentioned papers takes into account how the effects of regulation vary across market structures that is the core of our work.

Rasmusen (2001) shows that the reading cost can be considered as a driver of contract incompleteness. He develops a bargaining model with a finite number of quality levels where negotiation is modelled as a game in which one party offers some clauses and the other has to decide whether to examine them carefully or not. Results highlight that social welfare is maximized when the offeror precommits to offer sincere clauses and therefore the acceptor can buy without reading, whereas no-precommitment equilibria, some of which in mixed strategies, are Pareto-inferior. This work does not identify different clauses in the offeror's proposal, but simply a contract whose whole content is obscure. We do not allow the offeror, i.e. the seller, to precommit to his offer, but we include a signalling component, i.e. the price, that is freely observable. In addition, our work does not focus on negotiation itself, as in Rasmusen (2001), but rather on the effects of legal remedies, like mandatory disclosure, usually introduced to mitigate the inefficiency generated by the use of fine print.

Our paper also relates to the classic literature on the voluntary disclosure of product quality, where fine print can be considered as an interpretation of non-disclosure. The main result of this stream of literature is the well known "unravelling result": if disclosing is costless for sellers, they will disclose in equilibrium starting from the firm selling the best quality (Grossman 1981; Milgrom 1981). Conversely, if disclosing is costly, only high-quality firms will have an interest to disclose (see, among others, Viscusi 1978 and Grossman and Hart 1980 for a monopoly; Levine, Peck, and Ye 2009 and Board 2009 for a duopoly). All the mentioned papers assume that quality is (1) exogenous, (2) a private information

8 A similar result characterizes also Board's (2009) model where quality is exogeneous.

of sellers unless disclosed, and (3) either not verifiable or verifiable ex post. What differs in our paper is that we need to model quality as an endogenous decision of each seller because it refers to the contract clauses. Moreover, since consumers have the opportunity to read clauses they can verify the quality of the offer ex ante if they bear the related cost.

Recently, Bilancini and Boncinelli (2021) propose a model in which the seller can incur a cost to certify information correlated to the quality of the good she sells; the buyer observes the seller's decision and, if the label was not disclosed, decides whether to acquire information on quality (not on the label) at some cost, and offers a price. Giving the buyer this opportunity makes the unravelling result fail: when there is sufficient uncertainty about quality the buyer decides to acquire information and no type of sellers reveals her private information. The introduction of mandatory disclosure can potentially benefit the buyer (who saves the acquisition cost), but can backfire sellers who gain if selling a low-quality good, and lose otherwise. It happens whenever observing the label discourages the buyer from acquiring information by his own. The authors model quality as exogenous in the main model, and then propose a variant where the joint distribution of qualities and traits is endogenous: they find that the no label disclosure equilibrium still exists and mandatory disclosure may harm consumers pushing sellers to offer low quality.

Although the similarities with this last work are evident, our model differs at least in two aspects. First, we model disclosing and reading as perfect substitutes: if sellers disclose their contracts, consumers become fully aware of the contract content without paying the reading cost. Conversely, in Bilancini and Boncinelli (2021) sellers' disclosure is partially informative, as it refers to the label that, in turn, is correlated to quality: it implies that the buyer could still decide to acquire direct information on quality. It leads to at least two main different results: (1) the unravelling effect applies to our model if the disclosing cost is assumed to be very small, and (2) mandatory disclosure pushes sellers to offer favorable (or high quality) clauses rather than unfavorable clauses. Second, sellers (not consumers) set the price, whose level depends on the market power: it follows that mandatory disclosure cannot benefit consumers facing a monopolist, whereas the effect on their utility in a competitive market is ambiguous and depends on the equilibrium beliefs consumers hold that a non-disclosed contract is favorable.

3 Model

The game G is played by a fixed number $N \geq 1$ of sellers (she) and a unit mass of homogeneous and rational consumers (he), each buying a single unit of the good. If $N = 1$ then we refer to the seller as a monopolist; we say that there are several sellers when $N > 1$, sometimes referring to such markets as competitive. Sellers first simultaneously offer a contract; consumers then simultaneously select a contract and decide whether to trade. The game then ends.

We now describe the game in details.

G consists of two stages:

Stage 1: Sellers

Seller(s) produce an indivisible good that looks identical to consumers and, if unregulated, draft a take-it-or-leave-it contract $C = \{p, k, D\}$, offered to any potential customer. Precisely:

- p is the price clause;
- k is the second (non-price) clause and may be either favorable (f) or unfavorable (u) to consumers: accordingly, we say $k \in \{f, u\}$.[9]
- D is the disclosure strategy. Under a duty to read regime, it consists of a binary choice $D = \{0, \delta\}$: consumers observe both clauses for free if $D = \delta$, whereas they only observe p if $D = 0$, meaning that the second clause k is shrouded in fine print. Conversely, under a duty to disclose regime, sellers are forced to set $D = \delta$. Disclosure is assumed to be credible, verifiable, and freely observable to all consumers.[10]

As said, sellers draft their contracts simultaneously; so under a duty to read (resp. to disclose) regime, a seller's strategy consists in setting $C = \{p, k, D\}$ (resp. $C = \{p, k, \delta\}$).[11]

Stage 2: Consumers

If consumers bear the duty to read, they select a contract after observing both the price of each contract on offer and whether it is disclosed or not. If the selected contract is not disclosed then consumers can either accept without reading, reject without reading, or read the second clause and then decide whether to accept or reject. If the selected contract is disclosed, then consumers also observe the second clause, and either accept or reject. The last situation always occurs if a duty to disclose regime comes into force. We call $\rho(p, k, 0)$ the probability that a consumer reads a non-disclosed contract, where $\rho = 0$ if $D = \delta$.

9 For example, suppose that the second clause contains a warranty against possible damages: whether the warranty is favorable or not to consumers depends on terms and conditions regulating its extension and limits.

10 Disclosing ensures that each consumer understands terms: i.e. according to US legislation, it consists in writing terms in plain and clear language.

11 Contrary to D'Agostino and Seidmann (2016) we do not allow for simple (viz. one-clause only) contracts.

Formally, each consumer can choose at one information set if $D = \delta$: a consumer observes both the price (p) and the second clause (k). Conversely, if $D = 0$ each consumer can choose at two information sets: a consumer observes only the price (p) at his first information set, and reaches his second information set after reading the second clause. A strategy for a consumer specifies that he accepts, rejects or reads one of the contracts on offer, and his decision after reading a non-disclosed contract.

Our assumption that a buyer who rejects cannot search any other seller is, of course, extreme. We adopt this assumption because it simplifies exposition and, more importantly, because our main results also apply when consumers can resample: cf. our discussion in Section 6.3.

Payoffs and Efficiency

Consumers share the same preferences on clauses, and value unfavorable and favorable clauses, u_{u} and u_{f} respectively, with $u_{\mathrm{f}} > u_{\mathrm{u}}$. A consumer's return equals 0 if he does not consume, and $u_k - p$ if he buys a good priced at p with terms $k \in \{f, u\}$. Moreover, under a duty to read regime, consumers incur a fixed cost, denoted by $r > 0$, if they decide to read the second clause of a non-disclosed contract. This cost could represent the time taken to read legal clauses or be incurred by hiring an expert. A reading consumer earns r less in each eventuality. Hence, a consumer's payoff from buying equals his return minus any reading cost incurred.[12] Conversely, if disclosure is mandatory, consumers never pay the reading cost because they always observe the second clause for free.

Conversely, a seller's payoff from trading with a given consumer is the difference between her revenue and her costs, where revenue is the price (p) and costs are incurred by writing the contract (η), offering favorable clauses (c), and disclosing (d). Precisely**:**

- (writing cost) $\eta \simeq 0$ is paid regardless of the quality of the second term. It may consist of the cost of printing the contract and it is assumed to be very small. We will use it to exclude some (uninteresting) equilibria;
- (production cost) $c > 0$ may consist in using better (and more expensive) components or to offer a warranty in case of damages. It is paid for each unit sold only if the seller offers favorable clauses. For the sake of simplicity we assume that production cost is 0 for unfavorable clauses.
- (disclosure cost) $d > 0$ is paid for each customer in order to disclose the related contract. Then, if a regulation imposes a duty to disclose sellers are forced to pay d in order to trade.

12 Even if the offer is not transparent, consumers are supposed to experience the quality of the good for free after purchase (ex post).

A seller's total payoff Π corresponds to the integral of her payoff from trading with all her customers.

Throughout the paper we will use

$$\textbf{Efficiency Condition}: \; u_{\mathrm{f}} - c - \max\{r, \mathrm{d}\} > u_{\mathrm{u}} > 0.$$

The left-hand side inequality implies that favorable clauses are socially efficient, but the first best requires no (reading or disclosing) cost being paid. The right-hand side inequality also implies that trade is mutually profitable even if clauses are unfavorable: we then exclude that fine print includes hidden or add-on costs or disutilities. We will relax this assumption in Section 6.2.

Solution concept and refinement

We will analyze G by characterizing Perfect Bayesian Equilibria (PBEs) in pure and mixed strategies, where a consumer's belief assigns a probability distribution over the clause quality in a non-disclosed contract priced at p: for every $p \in \mathbb{R}_+$.[13] Given the large variety of PBEs typically arising in games like this, we use a restriction on out-of-equilibrium beliefs[14] such that if consumers observe a non-disclosing seller who deviates from the (disclosed or non-disclosed) contract the PBE prescribes, then consumers attach probability 1 that the deviating seller offers an unfavorable contract.[15] Two remarks will turn out very useful:

Remark 1. Whatever (disclosed or not disclosed) contract a PBE prescribes, out-of-equilibria beliefs do not apply to a deviating seller who discloses: consumers observe both clauses of such deviating contract and will evaluate the utility they could get from it compared to the (expected) utility from matching with a non-deviating seller.

Remark 2. If a PBE prescribes sellers not to disclose, consumers do not change their beliefs on the path if they observe disclosure out of the path.

The PBEs we will analyze also satisfy a pair of restrictions:

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13 According to Fudenberg and Tirole (1991), a PBE can be intended as a set of strategies and beliefs such that, at each stage of the game, strategies are optimal given the beliefs, and the beliefs are obtained from equilibrium strategies using Bayes' rule.

14 According to Mas-Colell, Whinston, and Green (1995), out-of-equilibria beliefs are left totally free in a PBE.

15 Suppose that a PBE prescribes an undisclosed contract $\{p^*, k, 0\}$: consumers will infer that a deviating non-disclosed contract charging any $p \neq p^*$ is unfavorable with probability 1. The same restriction applies in D'Agostino and Seidmann (2016).

(*Symmetry*) The first restriction requires players to behave symmetrically in three senses. First, all consumers hold the same beliefs about the content of the second clause of any non-disclosed contract: out as well as on the equilibrium path. Second, every consumer is equally likely to match with all sellers who offer contracts which he top-ranks (depending on his beliefs on and out of the path). Third, all sellers offer the same contract or mix between the same contracts. Symmetry simplifies exposition without affecting the message of the paper.

(*No trade*) The second restriction excludes uninteresting no-trade equilibria in which consumers enter the market, match with a seller but do not read and do not buy;[16] anyway, we need to consider this eventuality out of the path; finally, the writing cost η excludes strategy combinations in which a seller offers a contract which consumers do not read and do not accept or such that no consumer shows up (again these situations are considered out of the path).

This said, the reader might expect that a monopolist is able to charge the highest possible price exploiting her market power, whereas the competitive price should collapse to the Bertrand level. However, it cannot happen in those PBEs prescribing the seller(s) to offer a non-disclosed contract because consumers believe that deviating contracts charging a higher or lower price than that prescribed on the path are unfavorable.

Multiplicity of PBEs can be (partially) solved using the refinement originally proposed by Fudenberg and Levine (1989) for pure-strategy PBEs in a monopoly game. D'Agostino and Seidmann (2016) adapt it to the case of mixed-strategy PBEs in their monopoly game. Accordingly, we propose to associate to each original game G a class of perturbed games $G(\gamma;\phi)$ where each seller could be of two types: she is a commitment type with probability $\gamma > 0$ and a normal type with probability $1-\gamma$. The latter type proposes the original PBE contract prescribed in G, say $C(G)$; whereas the former type's preferences are defined according to the PBE contract, say C^*, ensuring the highest expected profit, defined as $\Pi(C^*) \equiv \Pi^*$, conditional on consumers strictly preferring C^* over rejecting if they face a monopolist (resp. over $C(G)$ if they face several sellers).[17] As a result, if G has a PBE in which sellers get $\Pi^* - \phi$ (where $\phi \geq 0$) the commitment type will play the corresponding PBE strategy in $G(\gamma;\phi)$. To characterize the PBEs of $G(\gamma;\phi)$, we denote the strategy played by consumers and the normal type of each seller in a PBE of $G(\gamma;\phi)$ as $\sigma(\gamma;\phi)$. Similarly to D'Agostino and Seidmann, we say that a strategy combination and consistent beliefs being a PBE of G can also be a ϕ-equilibrium of G if some sequence of perturbed games $\{G(\gamma;\phi)\}$ have PBEs with

16 Buyers match with a seller offering a non-disclosed contract, and reject without reading with positive probability in these putative equilibria.

17 We will clarify that C^* depends on market structure in next section.

strategy combinations $\sigma\{\gamma;\phi\}$ which converge to σ as both γ and ϕ converge to 0.

It is worthwhile to say that the application of this refinement does not affect the main message of the paper (that would survive if comparing the outcome of the regulated market with the outcomes of multiple PBEs in a free market), but it is used with the only purpose to exclude implausible beliefs. We refer to PBEs satisfying the refinement and the restrictions on *Symmetry* and *No trade* as "equilibria".

4 Duty to Read

Suppose that no regulation applies and sellers are free to choose clauses and whether to disclose them or not. This implies that consumers must read in order to understand non-disclosed contracts. We start with some considerations applying to both markets, then we present and discuss our main results. We will also discuss some variants of the model in Section 6.

Call β a consumer's belief that a non-disclosed contract he observes is favorable.

Lemma 1.

a. *A disclosing seller must offer favorable clauses in every PBE.*
b. *No PBE exists in pure strategies with sellers not disclosing.*

We prove Lemma 1 in the Appendix.

Part *a* comes straightforward from the Efficiency Condition: since consumers freely read transparent clauses, it turns out in sellers' interests to offer favorable contracts. Part *b* relies on the commitment problem arising every time a seller does not disclose, where the intuition is the following:

– if seller(s) offer favorable clauses in a pure-strategy equilibrium, then consumers would hold a belief $\beta = 1$ and would always accept without reading (to economize on the reading cost), in which case sellers have an incentive to defect (aka, to offer unfavorable clauses);
– if sellers offer unfavorable clauses in a pure strategy equilibrium, consumers would hold a belief $\beta = 0$ and would always accept without reading the cheapest contract charging no more than u_u: then, a monopolist and each competitive seller would respectively charge u_u and η. Efficiency, however, implies that a monopolist and each competitive seller could profitably deviate

respectively to $\{u_{\mathrm{f}}, f, \delta\}$ and $\{u_{\mathrm{f}} - u_{\mathrm{u}} - \eta - \varepsilon, f, \delta\}$, where $\varepsilon < u_{\mathrm{f}} - u_{\mathrm{u}} - \eta - c - d$.

What emerges from Lemma 1b is that a PBE without disclosure must be in mixed strategies, with sellers mixing between favorable and unfavorable clauses and consumers mixing between reading and accepting without reading.[18] It also applies in D'Agostino and Seidmann (2016): using their terminology we will refer to PBEs in which sellers disclose and offer favorable clauses as *favorable PBEs*, and to PBEs in which sellers do not disclose and offer favorable clauses with a positive probability as *semi-favorable* PBEs.

Given Lemma 1, we can make a first conclusion:

Corollary 1. (Efficiency). *No PBE ensures a first best outcome.*

Proof. First best requires that trade takes place with favorable terms with seller(s) never paying the disclosing cost and consumers never paying the reading cost. Proof of Corollary comes straightforward from Lemma 1, proving that no PBE can exist in which seller(s) do not disclose and offer favorable contracts which consumers accept without reading. □

We now characterize the equilibrium conditions in a monopoly and in a market with several sellers.

Let's consider a monopoly first. We define $\beta^{+} = \frac{1+\Omega}{2}$, where $\Omega = \sqrt{1 - \frac{4r}{A}}$, $A = u_{\mathrm{f}} - u_{\mathrm{u}}$, and $r^{*} = \min\left\{d, (A - d)\frac{d}{A}\right\}$.

Proposition 1. *In a monopoly:*

a. *(Semi-favorable equilibrium) If $r < r^{*}$, there exists a unique equilibrium in which the monopolist charges $p^{*} = u_{u} + \frac{2r}{1-\Omega}$ and mixes between favorable and unfavorable clauses without disclosing. Consumers believe that the contract is favorable with probability β^{+}, and mix between reading (with probability $\rho^{*} = \frac{c}{p^{*}-\eta}$) and accepting without reading (with probability $1 - \rho^{*}$). Those who read only accept a favorable contract and reject an unfavorable contract.*

18 Although we have limited the analysis to symmetric PBEs, it is worth mentioning that Lemma 1b excludes asymmetric equilibria in pure strategies in which some sellers disclose and other sellers do not.

b. *(Favorable equilibrium) If $r \geq r^*$, there exists a unique equilibrium in which the only seller offers a favorable and disclosed contract charging u_f, and consumers accept.*

To take into account the effects of the market structure, we postpone any comment after the characterization of equilibria for a market with several identical sellers. We define $\vartheta \in \left[r/(1-\beta_C^*), r/1-\beta^{\max}\right]$, $\beta_C^* = 1-\sqrt{r/A}$ and $\beta^{\max} = (B+X)/2NA$,[19] and $r^{**} = \min\left\{d, \frac{[N(c+d+\eta-u_u)+(u_u-c-\eta)]^2}{4N(N-1)A}\right\}$.

Proposition 2. *In a market with* $(N > 1)$ *identical sellers:*

a. *(Semi-favorable equilibria) If $r < r^{**}$, there exists a class of equilibria in which sellers charge $p^* = u_u + \vartheta$ and mix between favorable and unfavorable clauses without disclosing. Consumers believe that contracts are favorable with probability $\beta \in \left[\beta_C^*, \beta^{\max}\right]$, and mix between reading (with probability $\rho^* = \frac{c}{p^*-\eta}$) and accepting without reading (with probability $1-\rho^*$). Those who read only accept a favorable contract and reject an unfavorable contract.*
b. *(Favorable equilibrium) If $r \geq r^{**}$, there exists a unique equilibrium in which sellers offer a favorable and disclosed contract charging $c+d+\eta$, and consumers accept.*

We prove Proposition 2 in the Appendix. We now sketch our proof strategy, and provide some intuitions.

We have proposed a comparison between a monopoly and a market with N identical firms and have found conditions respectively for favorable and semi-favorable equilibria for a generic value of N, finding that the number of sellers does not affect the choice of whether to disclose or not the contract. Indeed, disclosure only depends on the value of the disclosure cost: if this cost is small enough and lower than the reading cost, sellers disclose in both markets; otherwise, they offer contracts with fine print. However, the existence of semi-favorable equilibria becomes less likely as N increases if we fix all the other relevant variables: the equilibrium price, and therefore a seller's expected equilibrium payoff, decreases as N increases, making deviations to disclosure more likely to be profitable.[20]

Using D'Agostino and Seidmann's (2016) expression, disclosure solves the commitment problem because consumers do not have to pay the reading cost

19 Where $B = N(2u_f - u_u - c - d - \eta) - (u_u - c - \eta)$ and $X = \sqrt{[N(c+d+\eta-u_u) - (u_u - c - \eta)]^2 - 4(N-1)NAr}$.

20 Sellers equally share the market in a semi-favorable equilibrium.

since seller(s) have decided to pay the disclosing cost.[21] The unravelling effect then applies: seller(s) do not include fine print because the low disclosing cost makes it profitable to deviate to disclosing, attracting in turn all consumers.

However, contract clauses apply to so many contingencies and recall so many laws and general agreements that making them fully intelligible to each consumer could be very hard and expensive.[22] If disclosing is more expensive than reading contract clauses, there exists a semi-favorable equilibrium in a monopoly (resp. a class of semi-favorable equilibria in a market with several sellers) in which deviating to disclosure is not attractive for seller(s) because the higher price they could charge out of the path is not enough to compensate the high disclosing cost they should bear. It also brings upon interesting effects on the equilibrium price in the two markets. According to Marotta-Wurgler's (2008) evidence, the monopolist charges a higher price than competitive sellers in both the favorable and semi-favorable equilibria.

Precisely, the assumption that consumers are all rational allows a monopolist to price discriminate[23] in a favorable equilibrium, getting the whole market surplus; whereas a monopolist using fine print has to charge a price higher than consumers' evaluation for an unfavorable contract (u_{u}), but lower than consumers' evaluation for a favorable contract (u_{f}): where the lower bound is necessary because the Efficiency Condition makes it profitable for the seller to deviate to disclosing otherwise, whereas the upper bound is necessary to ensure that consumers read with positive probability.

Turning to a competitive market, sellers get 0 in the favorable equilibrium and positive expected profits in every semi-favorable equilibrium:[24] it precludes existence of an equilibrium in which sellers mix between disclosing and non-disclosing.[25] However, the price which sellers can charge is lower than that charged by a monopolist in the corresponding equilibrium: it comes straightforward from the fact that seller(s) disclose in the favorable equilibrium, whereas

21 This is not necessarily true in Bilancini and Boncinelli (2021) because sellers can disclose the label, but buyers could still acquire information on the quality.

22 Ellison (2005) warns that in those industries where each firm produces more than one type of goods advertising the cost of add-ons for each product is prohibitively expensive for sellers.

23 This result is reminiscent of Katz (1990) who finds that a disclosing seller offers the full-information profit-maximizing quality.

24 This result is in line with Ellison (2005) and Gabaix and Laibson (2006) with the caveat that sellers make profits from the high shrouded add-on price in their models, whereas we do not distinguish between base good and add-ons.

25 Although we have limited the analysis to symmetric equilibria only, it is worth mentioning that this argument also excludes an asymmetric equilibrium (in pure or mixed strategies) in which some sellers disclose and some others do not disclose.

in semi-favorable equilibria a lower price is necessary to avoid consumers strictly preferring to trade with a deviating seller who discloses.

Consistent with the empirical literature (see Bakos, Marotta-Wurgler, and Trossen 2014), our model also predicts that a relatively low probability of reading is necessary in both markets to ensure existence of a semi-favorable equilibrium, and this probability is lower in a monopoly where the equilibrium price is higher. The intuition is the following: consumers are less likely to read where sellers are more likely to offer favorable clauses. Hence, seller(s) compensate for a higher price by including favorable clauses with a higher probability. It has interesting implications on welfare (see below).

Finally, some considerations about the Refinement should be made. We might be induced to think that a monopolist could prefer the PBE associated with her higher payoff and each of several sellers may try to attract consumers selecting the PBE associated with consumers' higher payoff. This cannot happen because any deviation from a given PBE contract is punished by consumers who believe that any non-disclosed contract out of the equilibrium path is unfavorable. Irrespective of the number of sellers, this property allows us to construct an interval of semi-favorable PBEs (if at least one exists). Multiplicity of PBEs can be (partially) solved using a refinement that associates to the original game G a perturbed game $G(\gamma;\phi)$ in which each seller is a commitment type with a probability γ and a normal type otherwise.[26] The latter proposes the contract that G prescribes in equilibrium, say $C(G)$; the former selects the PBE contract, say C^*, ensuring the highest expected profit. It requires consumers strictly preferring C^* over rejecting if they face a monopolist: in fact, the refinement works exactly as in D'Agostino and Seidmann (2016) if $N = 1$ with the commitment type selecting the contract associated to the supremum of PBE profits, say Π^*.

Moving to a market with several sellers, it is not enough that consumers strictly prefer to trade in C^* with a commitment type seller than rejecting. For the refinement being effective it must be that consumers strictly prefer the commitment type's contract C^* over the PBE contract of G ($C(G)$) offered by the normal type of a rival. As a result, the refinement is able to exclude only those PBEs of G associated to a price $p < p(\beta_C^*)$, whereas it has no power in the opposite case ($p \geq p(\beta_C^*)$). The intuition is the following: consumers' expected utility is a concave function of p and, therefore of β, because a higher price is associated to a higher probability that the second clause is favorable. It has a maximum in $p(\beta_C^*)$, meaning that for every $p < p(\beta_C^*)$ the increase of utility due to a higher probability

26 This refinement is reminiscent of that originally proposed by Fudenberg and Levine (1989), as said in Section 3. The original refinement applies to pure-strategy PBEs in a monopoly with the commitment type selecting the Stackelberg pure strategy.

that the second clause is favorable is higher than the decrease of utility due to a higher price, and viceversa for every $p < p(\beta_C^*)$. Conversely, sellers' profits are strictly increasing in p, and therefore in β, with a maximum in $\beta^{\max} > \beta_C^*$. It means that for every $C(G)$ charging $p < p(\beta_C^*)$ there exists another more expensive PBE contract yielding the same utility of $C(G)$ to consumers, but also ensuring higher expected profits to the seller. Conversely, it is impossible if $p \geq p(\beta_C^*)$.

We end this section by comparing welfare across equilibria and across market structures, using the following:

Corollary 2. (Welfare across market structures). *If a semi-favorable contract is offered in equilibrium in both markets, then welfare is higher under monopoly than in a market with several sellers.*

We relegate technicalities to the Appendix and sketch here the intuition behind this result.

A first best outcome requires sellers to offer favorable clauses *without disclosing*, which consumers accept *without reading*. This is impossible in any equilibrium because fine print can only be included if consumers motivate sellers to offer favorable clauses by reading with a positive probability, and if sellers motivate consumers to read by offering unfavorable clauses with a positive probability (See Lemma 1 and Corollary 1).

This said, we have shown that the only semi-favorable equilibrium (surviving the refinement) in a monopoly is supported by a higher probability that clauses are favorable than any semi-favorable equilibrium characterizing the market with several sellers. It proves the result: if a seller is more likely to offer a favorable contract, then consumers are more likely to accept, thereby economizing on socially wasteful reading.

5 Duty to Disclose

Despite the general principle that parties are free to negotiate contracts, courts and regulators have sometimes over-ruled unfavorable clauses in consumer contracts. In this section, we consider the ex ante effects of regulations which mandate disclosure in markets that differ in the number of sellers. To make the analysis as striking as possible, we assume that all consumers observe (and can therefore enforce) violations of regulations.[27] We also suppose that regulations address

27 A different assumption would make regulation useless.

clauses differently from price. This approach is consistent with the doctrine by which courts should intervene minimally.[28]

Proposition 3. *If regulation mandates disclosure then only favorable contracts are offered in equilibrium:*

a. *A monopolist offers $C = \{u_f, f, \delta\}$ and earns $u_f - c - d - \eta$. Consumers accept and earn 0;*

b. *Several sellers offer $C = \{c + d + \eta, f, \delta\}$ and earn 0. Consumers accept and earn $u_f - c - d - \eta$.*

The proof follows straightforward from the Efficiency Condition and Lemma 1a, and is therefore omitted. We now analyze the effects of such regulation on parties' payoffs and on social welfare.

Theorem 1. (Mandatory disclosure). *A regulation which mandates disclosure is ineffective if the reading cost is at least as high as the disclosing cost; otherwise, it makes both monopolist and several sellers worse off. Consumers are unaffected in a monopoly, whereas they sometimes gain and sometimes lose if they interact with several sellers.*

Irrespective of market structure, social welfare never increases and sometimes decreases.

Proof again is in the Appendix. We now provide the intuition of Theorem 1.

Regardless of the number of sellers, a duty to disclose solves players' commitment problem: consumers do not have to read (or, to be precise, read without bearing any cost) because sellers must disclose. However, this does not necessarily come out to be a good news in terms of consumers' choice and welfare. Rather, Theorem 1 seems to confirm Ben-Shahar and Schneider's (2011) conclusion that contract disclosure is probably not the solution for the issues faced by consumers when they are puzzling in reading fine print.

Consider a monopoly first. Proposition 1 proves that disclosing is profitable for a non-regulated monopolist if it is not more expensive than reading for customers; whereas, the semi-favorable equilibrium can exist only if deviating to disclosure is not profitable. Since social welfare coincides with the monopolist's profit, it turns out that mandatory disclosure (1) cannot increase but only reduce the monopolist's payoff, and therefore welfare; and (2) cannot help consumers

28 Cf. Restatement (Second) of Contracts §208 Comment g and §211(3).

who always get 0 in both legal regimes. The latter result rejects Kessler's (1943) argument that some regulation to protect consumers should be implemented especially when the seller can exploit some market power; whereas, the former is partially common to Katz (1990) who proves that an unrestricted duty to read regime is preferable whenever the seller voluntarily discloses.[29]

Turning to a market with several sellers, both sides of an unregulated market get positive payoffs in every semi-favorable equilibrium. Conversely, if disclosure is mandatory, social welfare equals consumers' payoff because sellers are forced to charge a price no higher than costs. Since sellers can only lose from disclosure, social welfare can increase only if consumers' gain is high enough to compensate sellers' loss: we prove in the Appendix that it is not feasible. Nevertheless, an equally interesting question is whether consumers may gain from mandatory disclosure.

Proposition 4. (Consumer protection and market structure). *Consumers can be protected by a mandatory disclosure regime only in a competitive market where unregulated sellers offer a favorable contract with a high enough probability: it is more likely to happen when the number of sellers is relatively small.*

Once again, a formal proof is in the Appendix and only an intuition is provided here. One may think that the beneficial effect of disclosure on consumers' utility may take place only if, in the absence of any regulation, sellers offer favorable contracts with low probability (viz., when β is low). However, we find an opposite result: consumers may gain from mandatory disclosure only if the semi-favorable equilibrium in the free market is supported by a very high β and therefore by a high price. The intuition is the following: consumers' utility (U_C) from a semi-favorable contract is concave in β and maximized at β_C^*. Since the refinement saves only those equilibria with $\beta > \beta_C^*$ it turns out that $\Delta U_C / \Delta\beta < 0$. It is more likely to happen when the number of sellers is small enough (but strictly more than one); conversely, as the number of competitors increases, the semi-favorable equilibrium price must decrease as well as β. This result is mainly due to the assumption that consumers hold homogeneous tastes about clause quality and observe the second clause at no cost if sellers disclose.

29 He also warns that an unlimited duty to read regime is Pareto-dominated by some regulations, imposing a certain quality level when the seller remains silent, that is when disclosing is sufficiently expensive.

6 Extensions and Further Discussion

Our model is based on some key assumptions mentioned below:

1. Consumers are all rational, so that they know seller(s) may include unfavorable clauses;
2. Consumer preferences over contract terms are homogeneous and favorable clauses are assumed to be more efficient than unfavorable clauses;
3. Market interaction is embedded in a one-shot game where consumers match with only one seller and, even after having rejected the contract, exit the market.

Conditions 1 and 2 are closely related and used to make results striking, whilst Condition 3 aims to make the analysis as simple as possible.

In this section, we consider whether our results change if we relax these assumptions.

6.1 Naive consumers

We have assumed that consumers are all rational. As highlighted in Section 2, consumer naivety has been deeply analyzed both in the literature on add-ons (see Ellison 2005; Gabaix and Laibson 2006) and, incidentally, in the literature on contracts of adhesion (see Friedman 2013; D'Agostino and Seidmann 2016).

Consider a modified version of the main model in which we include naive consumers, defined as follows:

(Naive consumers) Naive consumers (proportion $\alpha < 1$) share the same preferences over contract clauses with rational consumers; they believe that every contract charging at least $c + \eta$ is favorable, and that every contract charging less than $c + \eta$ is unfavorable.

If sellers disclose, a proportion $\alpha\lambda < \alpha$ of consumers does not understand disclosure: we call them "uninformed naives". Proportion $1 - \alpha\lambda$ understands disclosure and becomes rational: we call them "informed naives".

The assumption by which only a fraction of naives becomes informed if sellers disclose is common to Gabaix and Laibson (2006). Allowing for consumers heterogeneity pushes seller(s) to offer a menu of contracts. If the disclosing cost is lower than the reading cost, seller(s) will offer (1) a disclosed favorable contract (charging u_f or $c + d + \eta$ in a monopoly and in a competitive market, respectively) to attract rational and informed naive consumers and (2) a non-disclosed unfavorable contract (charging $u_f - e$, with $e \to 0$, or $c + \eta$ in a monopoly and in a competitive market, respectively): we refer to this equilibrium as the "semi-disclosed equilibrium". Conversely, if the reading cost is low enough (and lower than the disclosing cost) seller(s) will never disclose and offer (1) a contract priced at $p > c + \eta$, mixing between favorable and unfavorable terms, which will attract rational consumers only (proportion $1 - \alpha$), and (2) an unfavorable contract charging $p - e$, with $e \to 0$, which will attract naive consumers (proportion α): we refer to this equilibrium as the "no-disclosure equilibrium". Propositions 1bis and 2bis in the Appendix formally summarize these results and provide a proof.

If a regulation imposes a duty to disclose, seller(s) will still offer a menu of (disclosed) contracts: a favorable contract (charging u_f in a monopoly or $c + d + \eta$ in a competitive market) to attract rational and informed naive consumers, and an unfavorable contract (charging $u_\mathrm{f} - e$, with $e \to 0$, or $\max\{c, \mathrm{d}\}$ in a monopoly and in a competitive market, respectively). Proposition 3bis in the Appendix proves these results. It turns out that naive consumers do not necessarily gain from disclosure (see Theorem 1bis in the Appendix). Precisely, informed naives cannot lose and only gain in both markets, but uninformed naives always lose. Informed naives behave as rational consumers and do not accept the cheapest contract anymore as they do in the no-disclosure equilibrium. Conversely, uninformed consumers do not exploit disclosure and still buy the cheapest contract. This makes it profitable for seller(s) to offer a menu of disclosed contracts, where the cheapest is unfavorable. However, sellers must pay the disclosing cost: a monopolist will bear it because she is already price-discriminating and no consumer, including naives, would pay a higher price; whereas, competitive sellers transfer this cost to consumers if it is higher than the production cost or bear it otherwise, leaving in turn the price unchanged. Consumers' welfare is therefore unaffected when they face a monopolist, but they may lose in a competitive market because they may pay more for unfavorable clauses.

6.2 Heterogeneous Preferences and Efficiency

We have assumed that consumers share the same preferences over contract clauses: all of them value favorable clauses more than unfavorable ones. Also, we have assumed that favorable clauses are efficient (see the Efficiency Condition). We are aware that this scenario may not correspond to the real world: consumers, or al least some of them, may not be interested in buying an extended warranty and may prefer a cheap product. Allowing for consumers heterogeneity should push sellers to offer a menu of contracts, an unfavorable one to attract low-quality consumers and either a disclosed and favorable contract or a semi-favorable contract to attract high-quality consumers. This scenario would make it awkward to isolate the effect of a duty to disclose on consumers' utility: there is no way to protect low-quality consumers and the effects of a regulation would remain as they are.

Similarly, we believe the paper would lack robustness and interest if we relax the assumption that favorable clauses are also efficient (viz. $u_f - c > u_u$). Keeping in mind that an unfavorable contract is cheaper to produce for seller(s) than a favorable one, if we assume that $u_f - c < u_u$ then seller(s) would always offer an unfavorable contract in both markets without disclosing in the only pure-strategy equilibrium. It is enough to conclude that the effect of a duty to disclose regulation would be utility-improving for consumers, but it would be hard to justify on a social perspective since it would make social welfare decrease.

Although we have assumed that favorable clauses are efficient, we have also imposed $u_u > 0$, meaning that trade in unfavorable clauses is welfare-improving compared to no trade.[30]

Suppose now that $u_u < 0$. It does not affect the existence of the favorable equilibrium, but it makes the equilibrium price decrease in the semi-favorable equilibrium in both markets. The intuition is the following: if u_u is negative, consumers' expected utility from accepting without reading a (semi-favorable) equilibrium contract decreases, and in turn the equilibrium price must also decrease to ensure that they are indifferent between reading and accepting without reading. It has no significant effect on players' utilities and social welfare when a duty to disclose comes into force: hence, Theorem 1 would hold.

6.3 Repeated Game

We have assumed that consumers who reject must leave the market. While this assumption is extreme, the possibility of resampling would not affect our results if sellers could change their contracts before consumers rematch.

In particular, our results would still hold even if we assume that (1) sellers must fix their strategy on k and D before trade takes place and are free to change only p at the end of each period; and (2) every period consumers – matching with a not-yet visited seller – have to pay the cost to read an undisclosed contract even if they have previously read another contract.[31] Propositions 1ter and 2ter in the Appendix formally provide conditions ensuring existence of a favorable equilibrium and semi-favorable equilibria in both markets under these assumptions.

30 D'Agostino and Seidmann (2016) impose $u_u = 0$, but allow trade in unfavorable terms being welfare improving than trade in default terms.

31 It means that each period consumers who remain into the market acquire information about firms already visited, but this does not have any effect on the beliefs they hold on the other firms' strategy in and out of the path.

In fact, the favorable equilibrium found in Propositions 1b and 2a for the one-shot game can be replicated: even allowing for multiple matching, trade will take place in period 1 in both markets, with seller(s) offering a disclosed favorable contract priced at u_f and at $c + d + \eta$ respectively in a monopoly and in a competitive market, and all consumers accepting. This is the only equilibrium if reading is too expensive or more expensive than disclosing. Otherwise, a class of semi-favorable equilibria characterizes the game, with consumers who have decided to reject after reading in period n match with a new seller (if any) each future period $n + 1$. The game can be therefore played up to $N + 1$ periods in both markets: after having visited each of the N sellers in the market and rejected each contract, in period $N + 1$ consumers who are still in the market know the content of every offer because sellers cannot modify k. It has interesting implications on the equilibrium price.

Starting from the simplest case, in a monopoly the equilibrium price must decrease from period 1 (when it is set higher than u_u but lower than u_f) to period 2 (corresponding to $N + 1$): consumers who are still in the market know that the seller offers an unfavorable contract and buy only if the monopolist charges no more than u_u.

Turning to a competitive market, the equilibrium price must increase from period 1 to period N to keep consumers indifferent between reading and accepting without reading. The intuition is the following: consumers' utility from reading takes into account the chance to match with other sellers in future periods (and possibly to find favorable clauses), but this chance becomes less attractive period by period because the number of available sellers decreases, so that the expected utility from accepting without reading must also decrease to keep consumers indifferent. This is possible only if the equilibrium price goes up, excluding that consumers match again with the same seller if another not yet-visited firm is in the market.[32] The result is reminiscent of Diamond (1971), proving that reading costs play a similar role of searching costs. It also implies that the higher is N the lower is the initial price (aka the price charged in period 1). In the last period $N + 1$, however, price must collapse to the Bertrand level because consumers know that every contract is unfavorable. Then sellers set a price equal to η and consumers randomly choose a seller and accept, earning $u_u - \eta$.

Allowing for repeated interactions does not change, however, the effect of a regulation that mandates disclosure of contract clauses on parties' payoffs. Sellers

32 Note that consumers who have visited a store and read and rejected unfavorable clauses have no interest to come back to the same shop in equilibrium if clauses remain unfavorable and price increases. An opposite result would apply if we assume that a consumer who has read a contract (finding unfavorable clauses) is able to read at no cost other contracts in future periods.

may only lose in both markets, whereas consumers sometimes gain and sometimes lose only if facing competitive sellers (see Theorem 1ter in the Appendix). However, since consumers may read several times in equilibrium, the effect of mandatory disclosure on social welfare could be positive.

7 Conclusions

In the absence of public intervention, when consumers sign a contract they accept all the clauses in application of the so-called "freedom of contract" principle. In the last decades, however, with the emergence of this practice, especially in the online market, policy-makers have tried to intervene in order to reduce the risks related to the high bargaining power adopted by the strongest part of the agreement (the seller) against the weakest part (consumers).

It is well recognized that there are two broad forms of public intervention. First, a regulation on the clauses content in fine print, especially used in Europe after the Directive n. 93/13 has come into force, prohibiting some particularly unfavorable clauses (identified in a black list) to consumers, and leaving to the national authorities the task of evaluating the excessive burdens for the other (unfavorable) clauses. Second, the American-style intervention which consists in leaving the seller free to insert the content she prefers (even unfriendly), but forcing her to make the clause understandable (therefore, sellers pay the disclosure cost).

In our work we have dealt with the seller's market power under two different legal systems, i.e. an unregulated legal regime, and a regulation that mandates clause disclosure. In particular, we have provided a simple model examining the controversial issue of contract disclosure whenever the offer comes from seller(s) to consumers on a take-it-or-leave-it basis and consumers can verify a non-transparent contract ex ante by reading at some positive cost unless sellers have disclosed each clause. In our setup, we have compared a monopoly with a competition market assuming that in both cases the seller(s) prepare the contract by fixing the price (always visible and understandable) and inserting other clauses, friendly or unfriendly for consumers (for example, the conditions applied to the warranty for failure). In the absence of public intervention, seller(s) can also decide whether to make this second clause transparent and therefore understandable, or whether to hide it in fine print: in the first case, they will have to pay a disclosure cost, whereas in the second case, consumers will bear a cost if they want to read and understand the complicated clause.

Under some assumptions (i.e. consumers preferences are homogeneous, favorable clauses are efficient, market interaction is embedded in a one-shot game) we have obtained interesting results which can be summarized as follows:

– Market power does not seem to play any significant role on the contract complexity when seller(s) are free from any regulation. Indeed, seller(s) disclose whenever disclosing is cheaper than reading and otherwise mix between favorable and unfavorable clauses. Nevertheless, market structure affects the equilibrium price which is always higher in a monopoly than in a market with several sellers;
– Market power does play a significant role on consumers' protection if some regulations impose seller(s) to disclose clauses but leave them free to set the price: precisely, mandatory disclosure leaves consumers unaffected in a monopoly, whereas it may turn out in favor of consumers only if sellers compete with each other.

All in all, we have found that mandatory disclosure can never be welfare improving and, contrary to what the theory of the market structure suggests, it can (and only in some cases) favor consumers in competition and never in monopoly. Our results provide a suggestion to policy-makers in terms of removing the market entry barriers first, and then adopting mandatory disclosure regulations only in those markets with few enough firms: in this case, competition and mandatory disclosure can be rated as complements.

Appendix

Lemma 1

a. A disclosing seller must offer favorable clauses in every PBE.
b. No PBE exists in pure strategies with sellers not disclosing.

Proof. Proof is given by contradiction.

a. An optimal purchase strategy of a consumer must be weakly increasing in his belief about quality and disclosure weakly lowers belief about clause quality when quality is low. Suppose that a disclosing seller offers unfavorable clauses: since consumers freely read disclosed clauses, they reject if $p > u_{\mathrm{u}}$, and the seller can profitably deviate to non-disclosing at the same price to economize, at least, on the related disclosing cost d. Hence, conditional on clauses being unfavorable, deviating to non-disclosure must weakly raise purchases and revenues while strictly saving on the disclosure cost.
b. We first exclude existence of a PBE in which a non-disclosing seller offers favorable clauses without offering unfavorable clauses. Suppose otherwise: consumers would always accept without reading to economize on the reading

cost, so that sellers could profitably deviate to offering unfavorable clauses at the same price. We now exclude existence of a PBE in which a non-disclosing seller offers unfavorable clauses without offering favorable clauses. Suppose otherwise: consumers would reject at any price higher than u_{u} and the Efficiency Condition implies that sellers could profitably deviate to offering a disclosed favorable contract. In sum, a seller who offers favorable clauses with positive probability must offer unfavorable clauses at the same price with positive probability. □

Define $\beta^{+} = \frac{1+\Omega}{2}$, where $\Omega = \sqrt{1 - \frac{4r}{A}}$, $A = u_{\mathrm{f}} - u_{\mathrm{u}}$, and $r^{*} = \min\left\{d, (A-d)\frac{d}{A}\right\}$.

Proposition 1. *In a monopoly:*

a. *(Semi-favorable equilibrium) If $r < r^{*}$, there exists a unique equilibrium in which the monopolist charges $p^{*} = u_{\mathrm{u}} + \frac{2r}{1-\Omega}$ and mixes between favorable and unfavorable clauses without disclosing. Consumers believe that the contract is favorable with probability β^{+}, and mix between reading (with probability $\rho^{*} = \frac{c}{p^{*}-\eta}$) and accepting without reading (with probability $1-\rho^{*}$). Those who read only accept a favorable contract and reject an unfavorable contract.*
b. *(Favorable equilibrium) If $r \geq r^{*}$, there exists a unique equilibrium in which the only seller offers a favorable and disclosed contract charging u_{f}, and consumers accept.*

Proof. Assume that $u_{\mathrm{u}} > c + \eta$.

a. We prove existence of semi-favorable PBEs as characterized in Lemma 1b.

Suppose that sellers mix between favorable and unfavorable contracts and all charge the same price. Consumers earn $\beta u_{\mathrm{f}} + (1-\beta)u_{\mathrm{u}} - p$ from accepting without reading and $\beta(u_{\mathrm{f}} - p) - r$ from reading (and accepting only if clauses are favorable). Thus, they are indifferent if and only if the contract is priced at $p = u_{\mathrm{u}} + \frac{r}{1-\beta}$. Consumers cannot profitably deviate to accepting after reading that clauses are unfavorable because $p > u_{\mathrm{u}}$; they do not deviate to rejecting without reading (earning 0) if and only if

$$\beta \in \left[\frac{1-\Omega}{2}, \frac{1+\Omega}{2}\right] \equiv \left[\beta^{-}, \beta^{+}\right]:$$

where $\Omega = \sqrt{1 - \frac{4r}{A}}$ is well defined because $\frac{A}{4} > r^{*}$.

This said, the monopolist gets $p-c-\eta$ or $(1-\rho)(p-\eta)$ from offering favorable or unfavorable clauses respectively: substituting for p, she is therefore indifferent iff consumers read with probability $\rho = \frac{c}{p-\eta}$. Moreover, the monopolist makes a positive payoff if $u_{\mathrm{u}} > c + \eta$.

We now have to exclude deviations to either a favorable and disclosed contract or an unfavorable and obscure contract. The Efficiency Condition implies that excluding the former deviation is sufficient to exclude also the latter. Moreover, given consumers' out-of-equilibrium beliefs, the monopolist has no interest to raise the price above $u_{\mathrm{u}} + \frac{r}{1-\beta}$ because she would be rejected.

A monopolist cannot deviate to a disclosed contract if

$$p - c - \eta > u_{\mathrm{f}} - c - d - \eta \tag{1}$$

According to Lemma 1b, a monopolist must charge less than $u_{\mathrm{f}} - r$ in any semi-favorable PBE, otherwise no consumer would read with positive probability. Then, condition (1) cannot be satisfied if $d \leq r$. In addition, continuity implies that no semi-favorable PBE exists for some small $d > r$.

Suppose now that $d > r$. Since $p = u_{\mathrm{u}} + \frac{r}{1-\beta}$, condition (1) requires $\beta > 1 - \frac{r}{A-d} \equiv \dot{\beta}$. Again, $r < r^*$ ensures that $\dot{\beta} < \beta^+$.

The previous story implies that there also exists an equilibrium in which the monopolist mixes between a favorable disclosed contract priced at $p = u_{\mathrm{f}}$ and a non-disclosed contract charging $p = u_{\mathrm{u}} + \frac{r}{1-\dot{\beta}}$ which is favorable with probability $\dot{\beta}$ and unfavorable otherwise.

b. Consider a PBE in which a disclosing monopolist offers $\{u_{\mathrm{f}}, f, \delta\}$ and consumers accept: this PBE exists because the monopolist cannot profitably deviate to not disclosing if consumers believe that the deviating seller offers unfavorable contract (see the Efficiency Condition). A monopolist does not have any interest to lower the price below u_{f} if she discloses because she would get a lower payoff. Then, she earns $u_{\mathrm{f}} - c - d - \eta$ and consumers earn 0. Trade is efficient according to the Efficiency Condition as the seller offers favorable clauses and consumers do not pay the expensive reading cost; however, Corollary 1 warns that the equilibrium contract does not satisfy the first best.

To sum up,

1. If $r \geq r^*$, there exists only a favorable PBE: the monopolist gets $u_{\mathrm{f}} - c - d$ and consumers get 0.
2. If $r < r^*$, there exists the favorable PBE above, and a class of semi-favorable PBEs in which the monopolist mixes between $\{p, f, 0\}$ and $\{p, u, 0\}$, with $p = u_{\mathrm{u}} + \frac{r}{1-\beta}$ and $\beta \in \left[\max\left\{\dot{\beta}, \beta^-\right\}, \beta^+\right]$. Consumers read with probability

$\rho = \frac{c}{p-\eta}$: they all buy if the contract is favorable (probability β), otherwise, only non-readers buy (probability $1 - \frac{c}{p-\eta}$) and readers reject. The game ends. The monopolist gets $p - c - \eta$ and consumers get $\beta A - \frac{r}{1-\beta} > 0$.

3. If $r < r^*$ and $\beta = \dot{\beta}$, there exists the favorable PBE and a semi-favorable PBE, as described above, plus a semi-disclosed PBE in which the monopolist mixes between disclosing and mixing between favorable and unfavorable contracts without disclosing. The monopolist gets $u_{\mathrm{f}} - c - d - \eta$; consumers earn 0 if the monopolist discloses and $\dot{\beta} A - \frac{r}{1-\dot{\beta}} > 0$ if the monopolist does not disclose.

We now apply the refinement proposed by Fudenberg and Levine (1989), as modified by D'Agostino and Seidmann (2016), and associate a game $G(\gamma;\phi)$ in which the monopolist is a commitment type with probability γ and a normal type with probability $1 - \gamma$. □

Lemma 2. *If the only PBE of G is favorable, then $G(\gamma)$ only has a favorable equilibrium.*

Proof. If $r \geq r^*$, G only has a favorable PBE. The commitment type must then offer such contract and consumers believe that any non-disclosed contract is unfavorable; consequently, $G(\gamma;\phi)$ only has a favorable equilibrium. □

Lemma 3. *If G has semi-favorable PBEs, then $G(\gamma;\phi)$ has only an equilibrium in which the monopolist offers $\{p^*, f, 0\}$ with probability $\frac{1+\Omega}{2}$ and $\{p^*, u, 0\}$ with probability $\frac{1-\Omega}{2}$,where $p^* = u_u + \frac{2r}{1-\Omega}$.*

Proof. If $r < r^*$ then G has a class of semi-favorable PBEs and a favorable PBE. Arguments above prove that the monopolist is better off when charging $p^* \equiv p(\beta^+) = u_{\mathrm{u}} + \frac{2r}{1-\Omega}$ than in any other semi-favorable or favorable PBEs. Now, define the ϕ-commitment type monopolist as a monopolist who charges $p^* - \phi \equiv p^*_\phi$, where ϕ is small enough to ensure that $p^*_\phi \in \left[\max\left\{p(\dot{\beta}), p(\beta^-)\right\}, p^*\right]$.

We first exclude every semi-favorable PBE but the profit-maximizing one where the monopolist charges p^*. Consider a strategy combination of $G(\gamma;\phi)$ where both the normal and the commitment type pool and charge p^*_ϕ. The normal type cannot profitably deviate to charging any other $p \neq p^*_\phi$ because consumers would infer that the deviating price refers to an unfavorable contract. Moreover, according to the above analysis, consumers earn a positive expected utility from mixing between reading and accepting without reading, and cannot profitably deviate to rejecting. Consequently, $G(\gamma;\phi)$ has a PBE in which the monopolist mixes between $\left\{p_\phi^*, u, 0\right\}$ and $\left\{p_\phi^*, f, 0\right\}$. Taking limit as both γ and ϕ converge to 0, and so $p_\phi^* = p^*$, it turns out that G has a semi-favorable equilibrium in which the monopolist mixes between $\{p^*, u, 0\}$ and $\{p^*, f, 0\}$.

We now exclude that G has a favorable PBE. In such PBE the normal type earns $u_\mathrm{f} - c - d - \eta$ and consumers earn 0. So, consumers would be better off from trading with the commitment type offering p_ϕ^* and the normal type would profitably deviate to mimicking the commitment type if ϕ is small enough. Similar reasonings exclude the semi-disclosed PBE as well.

It turns out that consumers earn 0 in the only semi-favorable equilibrium surviving the refinement. □

Define $\vartheta \in \left[r/(1-\beta_\mathrm{C}^*), r/(1-\beta^{\max}\right]$, $\beta_\mathrm{C}^* = 1 - \sqrt{r/A}$ and $\beta^{\max} = (B+X)/2NA$, where B and X will be defined below, and $r^{**} = \min\left\{d, \frac{[N(c+d+\eta-u_\mathrm{u})-(u_\mathrm{u}-c-\eta)]^2}{4N(N-1)A}\right\}$.

Proposition 2. *In a market with $(N > 1)$ identical sellers:*

a. *(Semi-favorable equilibria) If $r < r^{**}$, there exists a class of equilibria in which sellers charge $p^* = u_\mathrm{u} + \vartheta$ and mix between favorable and unfavorable clauses without disclosing. Consumers believe that contracts are favorable with probability $\beta \in \left[\beta_\mathrm{C}^*, \beta^{\max}\right]$, and mix between reading (with probability $\rho^* = \frac{c}{p^*-\eta}$) and accepting without reading (with probability $1-\rho^*$). Those who read only accept a favorable contract and reject an unfavorable contract.*
b. *(Favorable equilibrium) If $r \geq r^{**}$, there exists a unique equilibrium in which sellers offer a favorable and disclosed contract charging $c + d + \eta$, and consumers accept.*

Proof.

a. Consider a semi-favorable PBE as described in Lemma 1b.

First of all, we will search for the equilibrium price and beliefs. Then, we compute consumers' expected utility and sellers' expected profits in equilibrium. We then exclude profitable deviations for both consumers and sellers.

Given *Symmetry*, consumers match with one of the sellers; they earn $\beta u_\mathrm{f} + (1-\beta)u_\mathrm{u} - p$ from accepting without reading and $\beta(u_\mathrm{f} - p) - r$ from reading (and accepting only if clauses are favorable). Thus, they are indifferent iff the contract is priced at $p = u_\mathrm{u} + \frac{r}{1-\beta}$. Consumers cannot profitably deviate to accepting after reading that clauses are unfavorable because $p > u_\mathrm{u}$; they do not deviate to rejecting without reading (earning 0) if and only if $\beta \in \left[\beta^-, \beta^+\right]$: We remind that $\Omega = \sqrt{1 - \frac{4r}{A}}$ is well defined because $\frac{A}{4} > r^{**}$. It will turn out useful to know consumers' maximum expected payoff:

Observation 1 In every period n consumers' expected utility $U(.)$ is a concave function of $p(\beta)$, which has a maximum at $\beta_C^* = 1 - \sqrt{\frac{r}{A}}$. □

We omit the obvious proof.

Sellers gain $\frac{(1-\rho)(p-\eta)}{N}$ from offering unfavorable clauses and $\frac{p-c-\eta}{N}$ from offering favorable clauses. They are therefore indifferent if $\rho = \frac{c}{p-\eta}$, similarly to a monopolist: $u_u > c + \eta$ ensures that sellers get positive payoffs in this class of PBEs and cannot profitably deviate to not trading.

Observation 2 Sellers' profit $\pi(.)$ is strictly increasing in p and, therefore, in β.

We now have to exclude profitable deviations to either a favorable and disclosed contract or to an unfavorable and obscure contract. The Efficiency Condition implies that excluding the former deviation is sufficient to exclude also the latter. Moreover, given consumers' out-of-equilibrium beliefs, no seller has an interest to lower the price below $u_u + \frac{r}{1-\beta}$ because she would be rejected.

Lemma 1a implies that a deviating seller who discloses will offer favorable clauses and consumers would therefore get $u_f - z$ from trading with her, where z is the deviating price. To be attractive, the deviating seller must charge $z < p + (1-\beta)A$, getting $z - c - d - \eta$. This deviation is therefore unprofitable if

$$\frac{p - c - \eta}{N} \geq z - c - d - \eta.$$

It requires

$$\beta \in \left[\frac{B - X}{2NA}, \frac{B + X}{2NA}\right] \equiv \left[\beta^{\min}, \beta^{\max}\right], \tag{2}$$

where $B = N(2u_f - u_u - c - d - \eta) - (u_u - c - \eta)$ and $X = \sqrt{[N(c + d + \eta - u_u) + (u_u - c - \eta)]^2 - 4(N-1)NAr}$ is well defined if $r < [N(c + d + \eta - u_h) + (u_u - c - \eta)]^2/4(N-1)NA$.

It is easy to show that $\left[\beta^{\min}, \beta^{\max}\right] \in \left[\beta^-, \beta^+\right]$ if $r < [N(c + d + \eta - u_h) + (u_u - c - \eta)]/2 > r^{**}$ and $N \geq 2$: so that condition (2) is necessary and sufficient.

What said proves that no PBE can exist in which sellers mix between a favorable disclosed contract and a non-disclosed contract which is favorable with some probability β and unfavorable otherwise. Indifference requires sellers getting the same expected payoff, but they cannot charge more than their costs if they disclose, whereas they would get positive expected payoffs from non-disclosing.

b. Consider a PBE in which sellers disclose and offer $\{c + d + \eta, f, \delta\}$ and consumers accept: this PBE exists because sellers cannot profitably deviate either to not disclosing if consumers believe that the deviating seller offer unfavorable contract (see the Efficiency Condition) or to offering a disclosed unfavorable contract (see Lemma 1a). Consumers earn $u_{\mathrm{f}} - c - d - \eta$ and sellers earn 0. Trade is efficient according to the Efficiency Condition as the seller offers favorable clauses and consumers do not pay the expensive reading cost; however, Corollary 1 warns that the equilibrium contract does not satisfy the first best.

We now apply our refinement. First note that if $r \geq r^{**}$ Lemma 2 applies because G only has a favorable PBE, as in a monopoly. Suppose otherwise.

Observation 1 and 2 respectively imply that consumers' utility is increasing (resp. decreasing) in β for every $\beta \in [\beta^{\min}, \beta_{\mathrm{C}}^*]$ (resp. $\beta \in [\beta_{\mathrm{C}}^*, \beta^{\max}]$), and sellers' profits are increasing in β. We now abuse of some notation before applying the refinement: call $p_{\mathrm{C}}^* = p(\beta_{\mathrm{C}}^*)$, $p_{\mathrm{S}}^* = p(\beta^{\max})$, $p^- = p(\beta^{\min})$. We say that $G(\gamma; \phi)$ has a favorable [resp. semi-favorable] PBE if the normal type offers favorable [resp. semi-favorable] contracts in a PBE of $G(\gamma; \phi)$. □

Lemma 4. *If G has semi-favorable PBEs, then $G(\gamma; \phi)$ has a class of equilibria in which sellers offer $\{p^*, f, 0\}$ with probability β^* and $\{p^*, u, 0\}$ with probability $1 - \beta^*$, where $p^* \in \left[p_C^*, p_S^*\right]$.* □

Proof. **Case 1** Suppose that G has a semi-favorable PBE in which sellers charge $\hat{p} \; < p_{\mathrm{C}}^*$.

Call p^* the PBE price such that consumers are ex ante indifferent between matching with a seller charging $\hat{p}$ and a seller charging p^*. Concavity in p of the consumers' utility function implies that $p^* > \hat{p}$, so sellers' expected profits are higher in the PBE prescribing p^* than in that prescribing $\hat{p}$. We say that the commitment type in $G(\gamma; \phi)$ charges $p_{\phi}^* = p^* - \phi$, with $\phi > 0$ and mixes between $\left\{p_{\phi}^*, f, 0\right\}$ and $\left\{p_{\phi}^*, u, 0\right\}$. The commitment type would therefore attract all consumers getting $p_{\phi}^* - c - \eta > \frac{\hat{p}-c-\eta}{N}$, and the normal type could therefore profitably deviate to mimicking the commitment type in $G(\gamma; \phi)$. Taking limits as both ϕ and γ approach 0, we have that $p_{\phi}^* \to p^*$, so that $G(\gamma; \phi)$ has no equilibrium in which sellers charge $\hat{p} < p_{\mathrm{C}}^*$.

Case 2 Suppose that G has semi-favorable PBEs in which sellers charge $\check{p} \in [p_{\mathrm{C}}^*, p^+]$.

Observation 1 and 2 together imply that $\partial u(\check{p})/\partial p < 0$ for consumers and $\partial \pi(\check{p})/\partial p > 0$ for sellers: it follows that in $G(\gamma; \phi)$ the commitment type must offer the PBE contract of G. Arguments above then imply that every PBE in which sellers charge $\check{p} \in (p_{\mathrm{C}}^*, p^+)$ is an equilibrium of G.

Case 3 Suppose that G has a favorable PBE. Consumers and (the normal type of) sellers respectively earn $u_{\mathrm{f}} - c - d - \eta$ and 0 in any putative favorable PBE. Consumers prefer matching with the commitment type offering a non disclosed PBE contract if $\beta A + \frac{r}{1-\beta} > u_{\mathrm{f}} - c - d - \eta$, requiring:

$$\beta \in \left(\frac{A + u_{\mathrm{f}} - c - d - \eta - \Theta}{2A}, \frac{A + u_{\mathrm{f}} - c - d - \eta + \Theta}{2A} \right) \equiv [\beta^{\mathrm{low}}, \beta^{\mathrm{high}}]$$

where $\Theta = \sqrt{[A - (u_{\mathrm{f}} - c - d - \eta)]^2 - 4Ar}$.

Given Observation 2, take the PBE contract associated to $\max\left\{\beta^{\mathrm{high}}, \beta^{\mathrm{max}}\right\} \equiv \hat{\beta}$. Call $\hat{p}$ the PBE price associated to $\hat{\beta}$. We say that the commitment type in $G(\gamma;\phi)$ charges $\hat{p}_{\phi} = \hat{p} - \phi$, with $\phi > 0$ and mixes between $\left\{p^*_{\phi}, f, 0\right\}$ and $\left\{p^*_{\phi}, u, 0\right\}$. The commitment type would therefore attract all consumers getting $\hat{p}_{\phi} - c - \eta > 0$ and the normal type could therefore profitably deviate to mimicking the commitment type in $G(\gamma;\phi)$. Taking limits as both ϕ and γ approach 0, we have that $\hat{p}_{\phi} \to \hat{p}$, so that $G(\gamma;\phi)$ cannot have a favorable equilibrium. □

Corollary 2. (Welfare across market structures). *If a semi-favorable contract is offered in equilibrium in both markets, then welfare is higher under monopoly than in a market with several sellers.*

Proof. In both markets welfare equals $\beta A + u_{\mathrm{u}} - c - \eta$ in a semi-favorable equilibrium where seller(s) charge any given price $p(\beta)$. So, welfare is strictly increasing in β.

A monopolist's profit equals welfare when she charges $p^* = p(\frac{1+\Omega}{2})$ in the only semi-favorable equilibrium surviving the refinement. Turning to the competitive market, sellers charge a price $p \in \left[p^*_{\mathrm{C}}, p^+\right]$ in the class of semi-favorable equilibria surviving the refinement, where $p^+ \equiv p\left(\frac{B+X}{2NA}\right) < p^*$, proving the result. □

Theorem 1. (Mandatory disclosure). *A regulation which mandates disclosure is ineffective if the reading cost is at least as high as the disclosing cost; otherwise, it makes both monopolist and several sellers worse off. Consumers are unaffected in a monopoly, whereas they sometimes gain and sometimes lose if they interact with several sellers.*

Irrespective of market structure social welfare never increases and sometimes decreases.

Proof. If d $\leq r$ then only favorable and transparent contracts are offered in equilibrium, irrespective of the market structure (see Propositions 1a and 2a). Let's suppose the opposite scenario.

An unregulated monopolist mixes between favorable and unfavorable contracts without disclosing, and charges p^* in the only semi-favorable equilibrium if conditions in Proposition 1 hold. Then, she earns $p^* - c$ and consumers earn 0. This is an equilibrium because deviating to disclosing is unprofitable as $p^* - c > u_\mathrm{f} - c - d$. It turns out that imposing disclosure can only harm and never benefits the only seller. Consumers are charged u_f if the monopolist discloses and get 0, so they are unaffected.

Several sellers earn positive payoffs in a semi-favorable equilibrium, whereas competition forces them to cut price down to $c + d + \eta$ if they disclose. As a result, they lose from mandatory disclosure. Consumers earn $u_\mathrm{u} + \beta A - p^*$ in a semi-favorable equilibrium and $u_\mathrm{f} - c - d - \eta$ from disclosure. Then, disclosure harms them if

$$p^* < c + d + \eta - (1 - \beta)A \tag{3}$$

Substituting for $p^* = u_\mathrm{u} + \frac{r}{1-\beta}$, condition (3) requires

$$\beta \in \left[\frac{2u_\mathrm{f} - u_\mathrm{u} - c - d - \eta - \Phi}{2A}, \frac{2u_\mathrm{f} - u_\mathrm{u} - c - d - \eta + \Phi}{2A}\right] \equiv \left[\beta^<, \beta^>\right].$$

where $\Phi = \sqrt{(c + d + \eta - u_\mathrm{u})^2 - 4rA}$ requires $r < \frac{(c+d+\eta-u_\mathrm{u})^2}{4A}$. It is easy to show that $\left[\beta^<, \beta^>\right] \subset \left[\beta^{\min}, \beta^{\max}\right]$ and $\beta^< < \beta^*_\mathrm{C} < \beta^>$. It means that consumers lose from disclosure if $\beta \in \left[\beta^*_\mathrm{C}, \beta^>\right]$ and gain if $\beta \in \left[\beta^>, \beta^{\max}\right]$.

Social welfare equals $u_\mathrm{u} + \beta A - c - \eta$ in a semi-favorable equilibrium in a free market, whereas it corresponds to consumers' utility ($u_\mathrm{f} - c - d - \eta$) under mandatory disclosure. A mandatory disclosure is welfare-improving it and only if $\beta < 1 - \frac{d}{A}$, which is impossible as it violates condition (2). □

Proposition 4. (Consumer protection and market structure). *Consumers can be protected by a mandatory disclosure regime only in a competitive market where unregulated sellers offer a favorable contract with a high enough probability: it is more likely to happen when the number of sellers is relatively small.*

Proof. Theorem 1 has proved that consumers cannot gain and cannot lose from mandatory disclosure if the seller is a monopolist: we can therefore turn to a competitive market.

From Proposition 2 we know that a semi-favorable PBE can exist in a competitive market only if condition (2) holds, which excludes that sellers profitably deviate to disclosing. It is easy to show that $\partial\beta^{\min}/\partial N > 0 > \partial\beta^{\max}/\partial N$, meaning that the equilibrium range of β decreases as N increases.

From Theorem 1 we know that consumers gain from mandatory disclosure only if unregulated sellers offer favorable contracts with probability $\beta \in \left[\beta^{>}, \beta^{\max}\right]$.

Putting all together, it turns out that as N increases $\beta^{\max} \to \beta^{>}$ and the positive effect of mandatory disclosure on consumers becomes less likely, proving the result. □

Naive consumers

To simplify the analysis we will omit the writing cost.

Naive consumers's beliefs are: $\beta_{\mathrm{N}} = 1$ for every $p \geq c$ and $\beta_N = 0$ for every $p < c$. Nothing changes for rational consumers, so their beliefs (now called β_{R}) remain unchanged compared to the main model.

Define $\hat{r}^* = \left\{d, K\left(1 - \frac{K}{A}\right)\right\}$, where $K = A - \alpha(1-\lambda)(c-e) - (1-\alpha\lambda)d$.

Proposition 1bis. *In a monopoly, if some consumers are naive:*

(No disclosure equilibrium) If $r < \hat{r}^*$, the following strategies and beliefs form the only unique equilibrium: the only seller offers $C = \{C_1, C_2\}$, where $C_1 = (\{p^*, f, 0\}, \{p^*, u, 0\})$ and $C_2 = \{p^* - e, u, 0\}$ with $p^* = u_u + \frac{2r}{1-\Omega}$ and $e \to 0$, naive consumers accept C_2 without reading; rational consumers mix between accepting without reading and reading (accepting only if $k = f$) C_1, Consumers' beliefs are $\beta_{\mathrm{N}}(C_1) = \beta_{\mathrm{N}}(C_2) = 1$, $\beta_{\mathrm{R}}(C_1) = \beta^+$, $\beta_{\mathrm{R}}(C_2) = 0$ and $\rho^* = \frac{c}{p^*}$. Otherwise,

(Semi-disclosure equilibrium) If $r \geq \hat{r}^*$, the following strategies and beliefs form the unique equilibrium: the only seller offers $C = \{C_1, C_2\}$, where $C_1 = \{u_{\mathrm{f}}, f, \delta\}$ and $C_2 = \{u_{\mathrm{f}} - e, u, 0\}$ with $e \to 0$; naive consumers accept C_2 without reading; and rational consumers accept C_1 without reading. Consumers beliefs are $\beta_{\mathrm{N}}(C_1) = \beta_{\mathrm{N}}(C_2) = \beta_{\mathrm{R}}(C_1) = 1$ and $\beta_{\mathrm{R}}(C_2) = 0$.

Proof. (No disclosure equilibrium). Suppose now that the monopolist does not disclose and offers a menu of contracts in the premise.

The presence of naive consumers does not impinge on equilibrium conditions for rational consumers' indifference and on their probability of reading (ρ) found in Proposition 1a because only rational consumers mix between reading and accepting without reading the contract with the higher price, whereas naives will buy without reading the lower-priced contract. So, it must be $\beta \in [\beta^-, \beta^+]$, $\rho = c(1-\beta)/r$, and $r < r^*$.

The monopolist gets $(p-c)(1-\alpha) + \alpha(p-e)$ on the path and has no profitable deviation to offer a disclosed contract charging u_{f} and a non-disclosed unfavorable contract charging $u_{\mathrm{f}} - e$ if and only if

$$p - c(1-\alpha) - \alpha e > u_{\mathrm{f}} - (1-\alpha\lambda)(c+d) - \alpha\lambda e$$

requiring

$$\beta > 1 - \frac{r}{K} \equiv \beta^{\circ},$$

To have $\beta^{\circ} < \beta^{+}$ it must be $r < \hat{r}^{*} < r^{*}$.

(Semi-disclosure equilibrium) A monopolist offers a menu of contracts $\{u_{\mathrm{f}}, f, \mathrm{d}\}$ and $\{u_{\mathrm{f}} - e, u, 0\}$, where $e \to 0$: the former attracting rational and informed naive consumers (proportion $1 - \alpha\lambda$) and the latter attracting $\alpha\lambda$ uninformed naives. The only seller gets $u_{\mathrm{f}} - (1 - \alpha\lambda)(c + d) - \alpha\lambda e$. She cannot profitably deviate to offering a unique disclosed contract charging u_{f} because $e < c + d$; nor to a unique non-disclosed unfavorable contract charging u_{u} because the Efficiency Condition and $e < c + d$ imply that it is not profitable. Conversely, no equilibrium exists in which the monopolist offers either $\{u_{\mathrm{f}}, f, \mathrm{d}\}$ or $\{u_{\mathrm{u}}, u, 0\}$ only because she could profitably deviate to offer the menu above.

The Refinement follows the same line as in Proposition 1 with the commitment-type monopolist offering an unfavorable contract charging $p - \eta$ (with $\eta < e$) to attract α naive consumers and a contract charging $p^{*} - e$ that is favorable with probability β^{+} and unfavorable otherwise to attract rational consumers. □

Before moving to the competitive market, it will turn out useful to define $\xi \in \left[r/(1 - \beta_{\mathrm{C}}^{*}), r/(1 - \beta'^{\;\max}\right]$, $\beta'^{\max} = \frac{A + Nu_{\mathrm{f}} + H - J}{2NA}$ and $\hat{r}^{**} = \min\left\{d, \frac{(Nu_{\mathrm{u}} + H)^2}{4N(N-1)}\right\}$. H and J are defined in the proof below.

Proposition 2bis. *In a market with* $(N > 1)$ *identical sellers and* $\alpha < 1$ *naive consumers:*

(No disclosure equilibria) If $r < \hat{r}^{**}$*, the following strategies and beliefs form an equilibrium: sellers offer* $C = \{C_1, C_2\}$*, where* $C_1 = (\{p^{*}, f, 0\}, \{p^{*}, u, 0\})$ *and* $C_2 = \{p^{*} - e, u, 0\}$ *with* $p^{*} = u_{\mathrm{u}} + \xi$ *and* $e \to 0$*, naive consumers accept* C_2 *without reading; rational consumers mix between accepting without reading and reading (accepting only if* $k = f$*)* C_1 *, Consumers' beliefs are* $\beta_{\mathrm{N}}(C_1) = \beta_{\mathrm{N}}(C_2) = 1$*,* $\beta_{R}(C_1) \in \left[\beta_{C}^{*}, \beta'^{\max}\right]$ *and* $\beta_{\mathrm{R}}(C_2) = 0$*, and* $\rho^{*} = \frac{c}{p^{*}}$*. Otherwise,*

(Semi-disclosure equilibrium) If $r \geq \hat{r}^{**}$ *, the following strategies and beliefs form the unique equilibrium: sellers offer* $C = \{C_1, C_2\}$*, where* $C_1 = \{c + d, f, \delta\}$ *and* $C_2 = \{c + d - e, u, 0\}$ *with* $e \to 0$*; naive consumers accept* C_2 *without reading; rational consumers accept* C_1 *without reading. Consumers' beliefs are* $\beta_{\mathrm{N}}(C_1) = \beta_{\mathrm{N}}(C_2) = \beta_{\mathrm{R}}(C_1) = 1$ *and* $\beta_{\mathrm{R}}(C_2) = 0$.

Proof. (No disclosure equilibria). Suppose now that sellers do not disclose and offer the menu of contracts in the premise. Rational consumers believe that C_1 is unfavorable and therefore mix between reading and accepting C_2. The same conditions found for them being indifferent in Proposition 2 still apply here: it follows that $p = u_{\mathrm{u}} + r/(1-\beta)$ and $\beta \in [\beta^-, \beta^+]$. Sellers earn $\frac{(1-\alpha)(p-c)+\alpha(p-e)}{N}$ on the path, where e is very small and tends to 0. We now have to exclude a deviation to (i) a unique undisclosed and unfavorable contract, (ii) a unique and disclosed favorable contract and (iii) a menu of contract $C_1' = \{z-e, u, 0\}$ and $C_2' = \{z, f, \delta\}$. It is easy to show that excluding (iii) is sufficient to exclude both (i) and (ii).

The deviating seller would attract rational and informed naive consumers with C_2' if charging $z < p + (1-\beta)A$, as proved in Proposition 2, and would attract uninformed naives with a cheaper C_1', getting $(1-\alpha\lambda)(z-c-d) - \alpha\lambda(c+d+e)$, which is unprofitable iff

$$\beta \in \left[\frac{A + Nu_{\mathrm{f}} + H - J}{2NA}, \frac{A + Nu_{\mathrm{f}} + H - J}{2NA}\right] \equiv \left[\beta'^{\min}, \beta'^{\max}\right]$$

where $H = (1-\alpha)c - u_{\mathrm{u}} + \alpha e(N\lambda + 1) - N(1-\alpha\lambda)(c+d)$ and $J = \sqrt{(Nu_{\mathrm{u}} + H)^2 - 4N(N-1)Ar}$ is well defined if $r \leq \frac{(Nu_{\mathrm{u}}+H)^2}{4N(N-1)A}$. It is easy to show that $\left[\beta'^{\min}, \beta'^{\max}\right] \subset \left[\beta^-, \beta^+\right]$.

(Semi-disclosure equilibrium) Suppose sellers offer the menu of contracts in the premise: unaware naive consumers (proportion $\alpha\lambda$) believe that both contracts are favorable and prefer the cheapest one, so they buy without reading C_1. Rational consumers (proportion $1-\alpha\lambda$) believe that C_1 is unfavorable and expect to earn $u_{\mathrm{u}} - c$. They observe both clauses of the disclosed C_2 which yields a utility of $u_{\mathrm{f}} - c - d > u_{\mathrm{u}} - c$. Then, they reject C_1 and accept C_2. Sellers get $\alpha\lambda c/N$: deviating to offering a unique disclosed contract charging $c+d$ is not profitable because it would yield 0; deviating to offering a unique non-disclosed unfavorable contract charging 0 or c is not profitable either because in the former case the deviating seller would get 0, whereas in the latter she would still get the same payoff $\alpha\lambda c/N$. Conversely, no equilibrium exists in which sellers offer either $\{c+d, f, \mathrm{d}\}$ or $\{0, u, 0\}$ only because they could profitably deviate to offer the menu above. Suppose sellers offer $\{c, u, 0\}$. Only naive consumers (proportion α) would buy if $c > u_{\mathrm{u}}$ and sellers would get $\alpha c/N$: hence, a seller could profitably deviate to a menu of contracts, adding a disclosed contract charging $p > c+d$ to attract rational consumers getting positive payoffs. All consumers would buy if $c < u_{\mathrm{u}}$, and a seller would profitably deviate to offer that contract plus another undisclosed unfavorable contract charging less than c to attract all rational consumers.

The Refinement follows the same line as in Proposition 2. □

Proposition 3bis. *If seller(s) are forced to disclose contract clauses, then the unique equilibrium is formed by the following strategies and beliefs:*

(Monopoly) The only seller offers $C = \{C_1, C_2\}$, *where* $C_1 = \{u_f, f, \delta\}$ *and* $C_2 = \{u_f - e, u, \delta\}$; *naive consumers accept* C_2 *and rational consumers accept* C_1.

(Competition) Competitive sellers offer $C = \{C_1, C_2\}$, *where* $C_1 = \{c + d, f, \delta\}$ *and* $C_2 = \{\max\{c, \mathrm{d}\}, u, \delta\}$; *naive consumers accept* C_2 *and rational consumers accept* C_1.

Proof. (Monopoly). Suppose the monopolist offers $\{u_f, f, \mathrm{d}\}$ and $\{u_f - e, u, \mathrm{d}\}$. She gets $u_f - d - c + \alpha\lambda(c - e)$ and has no profitable deviation charging a price lower than u_f (resp. $u_f - e$) for a favorable (resp. unfavorable) contract because she would get a lower payoff. Since disclosure is mandatory, the only available deviation is to offer a unique contract charging u_f. If this contract were unfavorable only naive consumers would accept and the monopolist would get $\alpha\lambda(u_f - d) < u_f - d - c + \alpha\lambda(c - e)$ because $e \to 0$. If this unique contract were favorable, all consumers would buy and the monopolist would get $u_f - c - d < u_f - c - d + \alpha\lambda(c - e)$ because $e < c$.

We now exclude any other equilibrium. Suppose now that the monopolist offers a unique contract priced at u_f. This is impossible in equilibrium: if this contract is favorable (unfavorable) the monopolist would trade with all [resp. only uninformed naive] getting $u_f - c - d$ [resp. $\alpha\lambda(u_f - d)$]; so, she could profitably deviate to the menu above because $c > e$.

(Competition) Sellers get $\alpha\lambda \max\{c - d, 0\}$ on the path and cannot profitably deviate to higher prices because they would not make any sale. They cannot profitably deviate to a unique contract. If this contract were favorable, they could not charge more than $c + d$ and would get 0; if this contract were unfavorable they could not charge more than $\max\{c, \mathrm{d}\}$ and would trade with uninformed naives only getting the same payoff they have on the path ($\alpha\lambda \max\{c - d, 0\}$).

No other equilibrium can exist in which sellers offer only one contract, either favorable or unfavorable because they could profitably deviate to the menu of contracts above. □

Theorem 1bis. *In both markets informed naives cannot lose from mandatory disclosure, but uninformed naives cannot gain and sometimes lose. Both the monopolist and competitive sellers always lose from mandatory disclosure.*

Proof.

a. Informed naives get 0 in a regulated market and cannot lose from disclosure: indeed, they would have got 0 or lose $[2r/(1 - Y) + e]$ in an unregulated market, respectively in a semi-disclosure equilibrium and in the no disclosure equilibrium. Conversely, uninformed naives (proportion $\alpha\lambda$) make a loss of $u_u - u_f + e$ in a regulated market: hence, they do not gain and do not lose compared to a semi-disclosure equilibrium, but they lose compared to a no disclosure equilibrium because $u_f > u_u + 2r/(1-\Omega)$.

The monopolist always lose from mandatory disclosure as she gets $u_f - c - d + \alpha\lambda(c-e)$, whereas she would have got higher payoffs in both the semi-disclosure equilibrium [viz. $u_f - (1-\alpha\lambda)(c+d) - \alpha\lambda e$] and the no disclosure equilibrium [viz. $u_u + 2r/(1-\Omega) - c + \alpha\lambda(c-e)$].

b. Informed naives (proportion $1-\alpha\lambda$) get $u_f - c - d$ in a regulated market and cannot lose from disclosure: indeed, they would have got $u_u - c$ or $u_u - p_1 + e$ losing $[2r/(1-Y) + e]$ in an unregulated market, respectively in a semi-disclosure equilibrium and in the class of no disclosure equilibria. Conversely, uninformed naives (proportion $\alpha\lambda$) get $u_u - \max\{c, \mathrm{d}\}$ from disclosure, so they never gain but can lose compared to the semi-disclosure equilibrium in a free market where they would have got $u_u - c$; they always lose compared to the no disclosure class of equilibria where they would have got $u_u - p_1$ because $p_1 > c$.

Sellers get $\alpha\lambda \max\{c-d, 0\}$and always lose from mandatory disclosure because they would have got $\alpha\lambda c$ and $\mathbf{\Pi}^f/N$ respectively in the semi-disclosure equilibrium and in the no disclosure class of equilibria. □

Repeated game

The game is played up to $N+1$ periods. In period 0 sellers choose k and D: none of these strategies can be changed over time. Each period $n \in [1, N+1]$ sellers set the price p_n: so price can be updated at the beginning of each period.

Accordingly, a seller's strategy in each period n consists in setting a contract $C_n = \{p_n, k, D\}$, with $n = \{1, \ldots, N+1\}$.

Consumers who reject after or without reading in period n can match with another seller in period $n+1$; those who have read in period n and have rejected must pay again the reading cost to read another contract in period $n+1$. Then, in each period $n \in [1, N]$ a strategy for a consumer specifies that he accepts, rejects or reads one of the contracts on offer, and his decision after reading a non-disclosed contract.

To simplify the analysis we again omit the writing cost η. Define $\check{r}^* = \min\left\{d, c\left(1 - \frac{c}{A}\right)\right\}$.

Proposition 1ter. *In a monopoly:*

(Semi-favorable equilibrium) If $r < \check{r}^*$ the following strategies and beliefs form the unique equilibrium in which the game is played up to two periods:

- *in period 1, the monopolist mixes between* $\{p^*, f, 0\}$ *with probability* $\beta_1 = \beta^+$ *and* $\{p^*, u, 0\}$*) with probability* $1 - \beta^+$*, where* $p_1^* = u_h + \frac{2r}{1-\Omega}$*, and consumers mix between reading (with probability* $\rho_1 = \frac{c(1-\beta)}{r}$*) and accepting without reading with probability* $1 - \rho_1$*. Reading consumers accept if* $k = f$ *and the game ends. Otherwise*
- *in period 2, the monopolist will offer* $C_2 = \{u_u, u, 0\}$*; consumers know that* $k = \mathrm{u}$ *and accept without reading (*$\beta_2 = \rho_2 = 0$*).*

  (Favorable equilibrium) If $r \geq \check{r}^*$ *the following strategies and beliefs form the unique equilibrium in which the game is played only once: the monopolist offers* $\{u_{\mathrm{f}}, f, \delta\}$*, which consumers accept without reading.*

Proof. (Semi-favorable equilibrium). We prove existence of semi-favorable PBEs as characterized in Lemma 1b. We proceed backward as follows:

(**Period 2**) No trade occurs in period 2 if the monopolist has set favorable clauses (probability β): all consumers have already traded in period 1, after or without reading.

Suppose that the monopolist has set unfavorable clauses (probability $1 - \beta$). Only consumers who have read in period 1 are still in the market in period 2. Keeping in mind that clauses are not modifiable over time, since the seller is a monopolist consumers can match with her only again, but now they know the second clause (since they have already read it) and accept only if charged no more than u_{u}. The monopolist charges and gains $p_2^* = u_{\mathrm{u}}$. Consumers earn 0 and the game ends.

(**Period 1**) Consumers' indifference is ensured by $p_1 = u_{\mathrm{u}} + \frac{r}{1-\beta}$ and $\beta \in [\beta^-, \beta^+]$. (See Proposition 1). Consumers cannot profitably deviate to not reading and waiting until period 2 because the monopolist will charge u_{f} if her clauses are favorable and u_{u} otherwise: in both cases deviating consumers would earn 0. Consumers cannot deviate to accepting after reading that clauses are unfavorable in period 1: his utility would be negative because $p_1 > u_{\mathrm{u}}$, and he could profitably deviate to rejecting and buying in period 2 when $p_2 = u_{\mathrm{u}}$.

The monopolist gets $p_1 - c$ or $(1 - \rho)p_1 + \rho u_{\mathrm{u}}$ from offering favorable or unfavorable clauses respectively: substituting for p_1, she is therefore indifferent iff consumers read with probability $\rho = \frac{c(1-\beta)}{r}$. It requires $\beta > 1 - \frac{r}{c} \equiv \bar{\beta}$: note that $\bar{\beta} < \beta^+$ because $r < \check{r}^*$. Moreover, note that the monopolist makes a positive payoff because we have assumed that $u_{\mathrm{u}} > c$.

We now have to exclude deviations to either a favorable and disclosed contract or an unfavorable and obscure contract. The Efficiency Condition implies that excluding the former deviation is sufficient to exclude also the latter.

A monopolist cannot deviate to a disclosed contract if

$$(p_1 - c) + \rho u_{\mathrm{u}} > u_{\mathrm{f}} - c - d \tag{4}$$

Condition (4) is automatically satisfied if condition (1) is satisfied: it requires $\beta > 1 - \frac{r}{A-d} \equiv \dot{\beta}$, where $r < \check{r}^*$ ensures that $\dot{\beta} < \beta^+$.

(Favorable equilibrium) Proof corresponds to the analogous equilibrium in the one-shot game (see Proposition 1b).

The Refinement follows the same line as in Proposition 1. □

Define $Y = \beta A - \frac{r}{1-\beta}$ and $\hat{\beta}^+ = \frac{\bar{\mathbf{N}}A+Z+\Delta}{2\bar{\mathbf{N}}A}$. $\bar{\mathbf{N}}$ and Δ are defined in the Proof below.

Proposition 2ter. *In a market with* $(N > 1)$ *identical sellers:*

(Semi-favorable equilibrium) If $r < \check{r}^*$ *the following strategies and beliefs form the unique equilibrium in which the game is played up to* $N + 1$ *periods:*

- *in period* $n \in [1, N]$, *sellers mix between* $\{p_n^*, f, 0\}$ *with probability* $\beta_n \in \left[\beta_C^*, \hat{\beta}^+\right]$ *and* $\{p_n^*, u, 0\}$ *with probability* $1 - \beta_n$, *where* $p_n^* = p_{n+1}^* - Y$. *Consumers mix between reading with probability* $\rho = \frac{c}{p_1}$ *and accepting without reading with probability* $1 - \rho$. *Those who read accept only if* $k = f$, *and reject otherwise matching with another seller in the next period.*
- *in period* $n + 1$, *sellers offer* $\{0, u, 0\}$ *and consumers accept without reading* $(\beta_{N+1} = \rho_{N+1} = 0)$.

(Favorable equilibrium) If $r \geq \check{r}^*$ *the following strategies and beliefs form the unique equilibrium in which the game is played only once: sellers offer* $\{c + d, f, \delta\}$ *and consumers accept without reading.*

Proof. (Semi-favorable equilibrium). Consider a semi-favorable PBE as described in Lemma 1b.

First of all we will search for the equilibrium price period by period. We also compute consumers' expected utility and sellers' expected profits in equilibrium. We then exclude profitable deviations for both consumers and sellers.

(**Period** $N + 1$) No seller offers favorable clauses because all consumers would have traded with her, after or without reading, when matched in some earlier period. Unlucky consumers who have previously read every contract offered by every seller and have always found unfavorable clauses (probability $(1 - \beta)^N$) will now buy only if charged no more than u_{u}. Since the second clause is known and cannot be modified, competition pushes sellers to charge 0 and consumers earn u_{u}. The game ends. Note that deviating to higher prices is not profitable for sellers because the deviating seller would not make sales.

Before proceeding to previous periods, call $U_n^{nr} \equiv \beta u_{\rm f} + (1-\beta)u_{\rm u} - p_n$ the expected utility of not reading and accepting in period n, and $U_n^r \equiv \beta(u_{\rm f} - p_n) + (1-\beta)X_n - r$ the expected utility of reading in period n: where X_n is the expected utility of rejecting unfavorable clauses and matching with another seller in future periods.

(**Period** N) Since $p_{N+1} = 0$ it turns out that $X_N = u_u$. For consumers being indifferent it must be $U_N^{nr} = U_N^r$: it requires $p_N = \frac{r}{1-\beta}$.

(**Period** $N-1$) Consumers are indifferent between reading and accepting without reading iff $U_{N-1}^{nr} = U_{N-1}^r$, where $U_{N-1}^r = \beta(u_{\rm f} - p_{N-1}) + (1-\beta)X_{N-1} - r$. Given $X_{N-1} = \beta(u_{\rm f} - p_N) + (1-\beta)X_N - r \equiv U_N^r$, consumers' indifference requires $p_{N-1} = p_N - Y$, where $Y = \beta A - \frac{r}{1-\beta}$.

(**Generic period** n) Consumers are indifferent between reading and accepting without reading iff $U_n^{nr} = U_n^r$. It requires $p_n = p_N - (N-n)Y$.

We now exclude any profitable deviation for consumers.

Deviating to accepting after reading that clauses are unfavorable:

The deviating consumer earns $u_{\rm u} - p_n$ and would get U_{n+1}^{nr} from rejecting that contract and accepting without reading in period $n+1$ (on the path). This deviation is therefore unprofitable if $u_{\rm u} - p_n < U_{n+1}^{nr}$: this condition always applies on the path because $Y < \beta(u_{\rm f} - u_{\rm u})$.

Deviating to remaining out from the market in period n and entering in period $n+1 < N+1$:

Such a deviation is unprofitable for consumers if $p_n < p_{n+1}$: since β (viz. the probability of finding favorable clauses) is unchanged, consumers' utility decreases over time. It requires

$$Y > 0 \tag{5a}$$

Deviating to remaining out from the market until period $N+1$:

Consumers earn $u_{\rm u}$ from buying in period $N+1$ and U_n^{nr} from accepting without reading in equilibrium in period n. Substituting for p_n, it turns out that condition (5a) is sufficient to prove that such a deviation is unprofitable. Trivially, it also excludes a deviation to not buying in every period, including $N+1$.

Condition (5a) is satisfied for

$$\beta \in \left[\frac{1-\Omega}{2}. \frac{1+\Omega}{2}\right] \equiv [\beta^-, \beta^+] \tag{5b}$$

as in a monopoly, with $r < A/4$. (Note that $A/4 > \check{r}^*$).

Deviating to matching in period n a seller already visited in period $n-1$:

Consumers reject on the path after reading if they find unfavorable clauses. Since clauses are not modifiable, consumers cannot profitably deviate to come back to a visited seller because the equilibrium price increases over time.[33]

Deviating to accepting after reading that clauses are unfavorable:

Deviating consumers earn $u_{\mathrm{u}} - p_n$ from accepting after reading in period n; whereas, they would earn in equilibrium X_n from rejecting and matching with other firms in future periods. Condition (5a) is sufficient to ensure that $X_n > u_{\mathrm{u}} - p_n$.

To conclude,

Observation 1 In every period n consumers' expected utility $U(.)$ is a concave function of $p(\beta)$, which has a maximum at $\beta_{\mathrm{C}}^{*} = 1 - \sqrt{\frac{r}{A}}$. □

We omit the obvious proof.

Since consumers are equally likely to match with every shop but those already visited in previous periods, it turns out that the share of consumers visiting a shop is $\frac{\rho(1-\beta)}{N-1}$ in period 2, $\frac{\rho^2(1-\beta)^2}{N-2}$ in period 3, and $\frac{\rho^{n-1}(1-\beta)^{n-1}}{N-n-1}$ in a generic period n.

It follows that sellers offering unfavorable clauses get $\frac{(1-\rho)p_1}{N}$ in period 1; in period 2 they get $\frac{\rho(1-\beta)(1-\rho)p_2}{N-1}$ because they trade with the proportion of consumers who have read and found unfavorable clauses elsewhere in period 1 (proportion $\rho(1-\beta)$), have decided not to read in period 2 (probability $1-\rho$); accordingly, $\frac{\rho^{n-1}(1-\beta)^{n-1}(1-\rho)p_n}{N-n-1}$ is the expected profit in period n.

Sellers offering favorable clauses get $\frac{p_1-c}{N}$ in period 1; in period 2 they get $\frac{\rho(1-\beta)(p_2-c)}{N-1}$ because they trade with the proportion of consumers who have read and found unfavorable clauses elsewhere in period 1 (proportion $\rho(1-\beta)$) regardless of whether they decide to read again in period 2 or not; and so on in future periods. Accordingly, their expected profit in period n is $\frac{\rho^{n-1}(1-\beta)^{n-1}(p_n-c)}{N-n-1}$.

Given $p_n = p_{n+1} - Y$, we can write $\Pi^u \simeq \frac{(1-\rho)p_1}{N[1-\rho(1-\beta)]} + \frac{(1-\rho)p_1+NY}{[1-\rho(1-\beta)]}\left[\frac{\rho(1-\beta)}{N(N-1)} + \frac{\rho^2(1-\beta)^2}{(N-1)(N-2)} + \cdots + \frac{\rho^{N-1}(1-\beta)^{N-1}}{2}\right]$ and $\Pi^f \simeq \frac{p_1-c}{N[1-\rho(1-\beta)]} + \frac{p_1-c+NY}{[1-\rho(1-\beta)]}\left[\frac{\rho(1-\beta)}{N(N-1)} + \frac{\rho^2(1-\beta)^2}{(N-1)(N-2)} + \cdots + \frac{\rho^{N-1}(1-\beta)^{N-1}}{2}\right]$. Sellers are therefore indifferent if

$$\rho = \frac{c}{p_1},$$

where

$$\hat{\beta} \equiv \frac{(N-1)A - c - Q}{2(n-1)A} > \beta > \frac{(N-1)A - c + Q}{2(n-1)A} \equiv \check{\beta} \tag{6}$$

33 Only in the unlucky event in which a consumer has always read and found unfavorable clauses from period 1 to period N, then in period $N+1$ that consumer will match again one of the firms previously visited: that firm will set a price $p_{N+1} = 0$ and that consumer will get u_u.

ensures that $c < p_1$: where $Q = \sqrt{[(N-1)A + c]^2 - 4(N-1)NAr}$ is well defined if $r \le \frac{[(N-1)A+c]^2}{4(N-1)NA}$ it is easy to show that $r < \check{r}^*$ ensures $\check{\beta} > \beta^+$, so that condition [6] always holds.

Observation 2 Sellers' profit $\pi(.)$ is a convex function: each period $n < N$ it has a minimum at $\beta_S^* = 1 - \sqrt{\frac{(N-n+1)r}{(N-n)A}}$; in period N it is strictly *increasing*.

Observation 3 $\beta_C^* > \beta_S^* \;\; \forall n$. □

Again, we omit the obvious proofs.

Now we exclude profitable deviations for sellers.

Sellers must make non-negative profits or they could profitably deviate to offering an unfavorable contract charging 0. Given $p_n < p_{n+1}$, condition (6) ensuring that $p_1 > c$ is necessary and sufficient.

Since clause quality and the disclosing strategy are both decided at the beginning of the game and are non-modifiable, we have a few more deviations to exclude: precisely, at the beginning of the game, *a seller could deviate to either a favorable and disclosed contract or to an unfavorable and obscure contract*. The Efficiency Condition implies that excluding the former deviation is sufficient to exclude also the latter.

Although sellers must decide whether to disclose at the very beginning of the game, since consumers' utility decreases over time on the path, it may happen that consumers find it profitable to deviate to the disclosing seller later on at some period n, after having read and found unfavorable clauses elsewhere. Suppose it happens in period n^*, when the proportion of consumers who are still in the market is $\rho^{n^*-1}(1-\beta)^{n^*-1}$: consumers would deviate to the disclosing seller if charged no more than $p_{n^*} + (1-\beta)A$, where p_{n^*} is the price the semi-favorable equilibrium prescribes in period n. Putting everything together, deviating to disclosure is not profitable if and only if

$$\rho^{n^*-1}(1-\beta)^{n^*-1}\pi^d \le \Pi^f \tag{7}$$

where $\pi^d = p_{n^*} + (1-\beta)A - c - d$.

To simplify calculations, we will relax condition (7) and provide a sufficient condition (7′) below:

$$\rho^{n^*-1}(1-\beta)^{n^*-1}\pi^d \le \rho^{n^*-1}(1-\beta)^{n^*-1}\pi^f_{n^*} \tag{7′}$$

where $\pi^f_{n^*} = \frac{p_n*-c}{N}$ is the seller's payoff from offering favorable clauses on the path in period n^*.

Clearly, condition (7′) is stricter than condition (7) and is sufficient to prove the existence of the class of semi-favorable equilibria. Given $p_n = p_N - (N-n)Y$, a sufficient condition for (7′) therefore becomes

$$\beta \in \left[\frac{\bar{\mathbf{N}}A + Z - \Delta}{2\bar{\mathbf{N}}A}, \frac{\bar{\mathbf{N}}A + Z + \Delta}{2\bar{\mathbf{N}}\mathbf{A}}\right] \equiv [\hat{\beta}^-, \hat{\beta}^+]$$

where $\bar{\mathbf{N}} = (N-1)(N-n) + N$, $Z = N(A-c-d) + c$ and $\Delta = \sqrt{(\bar{\mathbf{N}}A - Z)^2 - 4\bar{\mathbf{N}}(N-1)(N-n+1)rA}$ is well defined if $r < \frac{(\bar{\mathbf{N}}A-Z)^2}{4\bar{\mathbf{N}}(N-1)(N-n+1)A} > \check{r}^*$.

Note that condition (3) requires $d > r$. Suppose otherwise: since $p_n > c$ for every $n \geq 1$ it must be $d > (1-\beta)A$, which is unfeasible in equilibrium.

To ensure that $\hat{\beta}^+ > \beta^+ > \hat{\beta}^-$ it must be $r < Z\left(1 - \frac{Z}{A}\right)$: a condition that must hold in every PBE because $Z\left(1 - \frac{Z}{A}\right) > \check{r}^*$. The same condition implies that $\hat{\beta}^- > \beta^-$ with $\beta_C^* \in \left(\hat{\beta}^-, \beta^+\right)$: a result that will turn out to be useful immediately below.

(Favorable equilibrium) Proof corresponds to the analogous equilibrium in the one-shot game (see Proposition 1b).

The Refinement applies as in the one-shot game. □

Theorem 1ter. (Mandatory disclosure). *A regulation which mandates disclosure is ineffective if the reading cost is at least as high as the disclosing cost; otherwise, it makes both monopolist and several sellers worse off. Consumers are unaffected in a monopoly, whereas they sometimes gain and sometimes lose if they interact with several sellers.*

Irrespective of market structure social welfare never increases and sometimes decreases.

Proof. If d $\leq r$ then only favorable and transparent contracts are offered in equilibrium, irrespective of the market structure (see Propositions 1a and 2a). Let's suppose the opposite scenario.

An unregulated monopolist mixes between favorable and unfavorable contracts without disclosing, and charges p_1^* in period 1 and u_u in period 2 in the only semi-favorable equilibrium if deviating to disclosure is not profitable. Since social welfare coincides with her profit (as consumers earn 0), it turns out that a regulation mandating disclosure harms the monopolist and is therefore socially inefficient, with consumers remaining unaffected.

Several sellers earn positive payoffs in a semi-favorable equilibrium, whereas competition forces them to cut price down to $c + d$ if they disclose. As a result, they lose from mandatory disclosure. Consumers earn $u_{\mathrm{u}} + \beta A - p_n^*$ in a semi-favorable equilibrium and $u_{\mathrm{f}} - c - d$ from disclosure. Then, disclosure harms them if

$$p_n^* < c + d - (1-\beta)A \tag{8}$$

Substituting for $p_n^* = \frac{r}{1-\beta} - (N-n)Y$, condition (8) requires

$$\beta \in \left[\frac{\tilde{\mathbf{N}}A + A - c - d - \Phi}{2\tilde{\mathbf{N}}A}, \frac{\tilde{\mathbf{N}}A + A - c - d + \Phi}{2\tilde{\mathbf{N}}A}\right] \equiv \left[\beta^{\min}, \beta^{\max}\right].$$

where $\Phi = \sqrt{[\tilde{\mathbf{N}}A - (A - c - d)]^2 - 4\tilde{N}^2 rA}$. It is easy to show that $[\beta^{\min}, \beta^{\max}] \subset [\beta^-, \beta^+]$ and $\beta^{\min} < \beta_C^* < \beta^{\max}$. It means that consumers lose from disclosure if $\beta \in [\beta_C^*, \beta^{\max}]$ and gain if $\beta \in [\beta^{\max}, \beta^+]$.

Social welfare equals $u_u + \beta A - c$ in a semi-favorable equilibrium in a free market, whereas it corresponds to consumers’ utility $(u_f - c - d)$ under mandatory disclosure. A mandatory disclosure is welfare-improving it and only if $\beta < 1 - \frac{d}{A}$, which is impossible as it violates condition (6). □

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