THE THEORY OF QUALITY REGULATION AND SELF-REGULATION :

TOWARDS AN APPLICATION TO FINANCIAL MARKETS*

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In this paper we review and extend the theory of quality regulation and of self-regulation and try to see to what extent the present theoretical literature can help to direct the regulatory reform of Italian financial markets. In financial markets, several countries have heavily relied upon self regulation (SR) essentially left to financial intermediaries, while others have preferred an approach more based on the intervention of a public agency; the two groups now seem to converge towards mixed systems. SR is likely to be a feasible alternative when the number of intermediaries is limited, the mobility of investors is high and the regulator's uncertainty on the firms' costs is substantial. However, to bridge the gap between theory and application still requires a remarkable effort

1. Introduction

After years in which price regulation has been at the center of the attention of the theoretical as well as the empirical debate, now the attention is shifting towards a greater concern for quality. This is largely due to the convinction that although regulation is quite powerful in controlling prices, an excessive emphasis on prices runs the risk of neglecting quality issues that (at least in the medium-long run) become at least as important. While price changes are immediately visible and can be easily monitored, the perception of quality levels typically takes much longer, but is not less relevant. The recent experience of the water industry in England or of several types of public procurements in Italy seems to indicate that strict price controls are often self-defeating, in that firms tend to cut costs at the expense of quality levels, and hence of consumers.

In this paper we want to build on the existing microeconomic literature to study to what extent market failures exist in the provision of quality, and to what extent different types of regulation can actually contribute to a solution. In particular, we will focus on self-regulation (SR) as an alternative to more traditional types of public interventions. More precisely, we want to analyze

i) in what sense the market may not lead to optimal quality level(s) (the market failure);

ii) what problems public intervention might run into (Government failure);

iii) what features self-regulation has in different market situations;

iv) under what conditions some of the previous problems may thus find a solution in it.

Our analysis will particularly focus on the stock market, which has a relevant tradition of self-regulation, and where proposals of regulatory reforms often try to strike a balance between external regulation and self-determined rules. In so doing we hope to give a contribution to the present (not only Italian) debate, helping to single out some likely consequences of a (more) systematic reliance on SR[1].

One of the main problems faced by any attempt to apply the theory is the one of the actual definition of quality, i.e. of a feature of the good, such that all consumers agree that "more is better than less". In general, each good is characterized by features on whose desirability consumers agree ("quality") and others on which their preferences

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[1] One topic that we will barely touch is whether we actually need so much regulation in financial markets. As we stress in the next section, (quality) regulation is not always needed, and the impression that some aspects of (Italian) financial markets are over-regulated is not ill founded.

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differ (these features distinguish different "varieties" of a good) and product differentiation can take place along each of these dimensions. Furthermore, quality is multi-dimensional, i.e. is a vector and not just a number, which is the common assumption of theoretical models, so that it is not banal to determine what a "better product" is.

The application of principles of self regulation to financial markets is far from banal for several reasons. First of all (an issue of extreme importance, but that will remain in the background of the paper) we have the problem of the determination of the real difference between "industrial" markets and "financial" markets; although there may be several answers to this question, we do not feel that the issue is completely settled. Markets for different assets also show different problems, which is the reason why here we will mainly consider stock markets. However, even in a stock market it is important to distinguish between large customers - typically more professional, better informed and potentially more mobile among intermediaries - and small ones - whose protection seems to be a more problematic issue. The organization of the stock market also makes a difference; for instance, self regulation with market makers is probably different from self regulation of match makers (a much less transparent situation); in the same way, it matters whether intermediaries have the "dual capacity" or possibly the permission to manage their clients' portfolios (in which case, regulatory problems become much more severe). And so on...

In the case of the stock market and in particular of financial intermediaries the definition of quality could be extremely complex. What is particularly relevant to our ends is to understand whether the quality of the service depends mainly on intrinsic features of the intermediary or rather on his actions. This is important, in that it allows one to determine whether the asymmetric information that we typically face should be considered mainly a problem of hidden characteristic (adverse selection), or rather one of hidden action (moral hazard). In general, the two aspects will be present together, and again we have a problem of applying theoretical models that (correctly) concentrate on one issue at a time.

The quality of the service depends both on the ability of the intermediary and on his effort to provide a good service[2]. The first problem has mainly to do with conditions of access to the profession and with the training of financial intermediaries - issues that seem to be relatively settled. Probably the second type of problem is the more important one when it comes to the policy debate, in that controlling the behavior of intermediaries, checking that transactions are carried out in a fair way and that the operator is actually working in the interest of his client are among the main issues on the present agenda.

These issues will be analyzed in the attempt to study the feasibility of SR and to compare its outcome with the outcomes of different regulatory constraints. In line with the prevailing modeling strategy, the definition of SR we adopt in the paper is that of a regulation of (potentially) rival firms run by the group of firms itself (e.g., intermediaries in financial markets). As analyses of SR exerted by a coalition of sellers, buyers and intermediaries have not yet been carried out, the desirability of involving other agents in the management of regulation will emerge from the limitations of the type of SR studied, and will be considered only in the conclusions.

The paper is organized as follows. Section 2 addresses the problem of (unregulated) quality choice asking whether a market failure really exists with and without asymmetric information. Section 3 reviews some of the main forms of intervention on quality, pointing out the limitations that public intervention inevitably faces. Section 4 turns to the (so far, extremely limited) theory of self regulation, showing to what extent the few existing results and some additional arguments can really help finding a role for SR in financial markets. Section 5 concludes the paper, trying to derive from the theory some (extremely tentative) policy indications.

2. How firms determine quality levels: do we have a market failure?

Let us first see to what extent it is true that market competition does not give firms sufficient incentives to produce the socially optimal quality levels.

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[2] Furthermore, the quality of the service depends on the "quality of the market", on its organization, on its functioning, on the conditions of competition among intermediaries, on listing procedures, and so on. Whether any of these matters should be left to self regulation is also an important point. Although we will not directly address this issue in the formal analysis, we will try and go back to it in the concluding section.

The basic point is that even in the simplest contexts very little can be said about the comparison between market equilibrium and social optimum. If we start from a full information set-up, we know from Spence (1975) that the quality level a monopolist chooses might be either higher or lower than the socially optimal one. This depends on whether the marginal valuation of quality given by consumers - the relevant parameter for profit maximization - is higher or lower than the average valuation of quality - crucial for welfare maximization. This condition boils down to a condition on how the marginal valuation of quality varies with income.

Let $p(q, x)$ be the inverse demand function, where p is price, q is quality and x is quantity. When $\partial p/\partial q$ decreases with x ($p_{qx} < 0$), the monopolist produces too low a quality level (for each given output level); this happens when the choices of consumers with the higher willingness to pay are more sensitive to quality than the choices of low-income consumers. Although this condition seems quite plausible, in general nothing can be said with certainty[3].

When we move from a monopoly to an oligopoly, we see that typically firms tend to differentiate their products in order to relax price competition[4]. Unfortunately, these models tend to be quite complex, so that - in order to study market equilibrium - heavy assumptions are introduced, that make the results obtained quite model-specific[5]; this makes it difficult to draw general conclusions on the comparison between optimal quality levels and equilibrium ones. Notice that on this point at least two separate issues emerge: first, how many firms (i.e., types of product) we observe; second, which quality levels are produced.

As regards the number of firms, there are two opposite effects. On the one hand, as entry requires a fixed cost, the free entry equilibrium tends to show an excess entry (duplication of fixed costs)[6]; on the other one, the tendency in vertically differentiated oligopolies is to have a limited number of firms, because competition in quality levels increases their fixed costs and sets an upper limit to the number of firms that can survive in equilibrium.

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[3] Notice that this also depends on the extent to which monopoly entails a restriction in output relative to its welfare maximizing level (Spence, 1975).

[4] Some more detailed welfare considerations are provided in Delbono *et al.* (1996).

[5] In particular, a detailed analysis of the equilibrium in models with more than two firms is quite complex without introducing highly specific assumptions on technology and income distribution; unfortunately, when more than two firms are present, some well known results can be reversed.

[6] See Suzumura and Kiyono (1987).

The indeterminacy that we see in a monopoly regarding the choice of quality levels carries over to the oligopoly equilibrium. Although the models that are usually analyzed show that equilibrium quality levels are lower than what would be desirable, it is hard to tell to what extent this result - obtained under the assumption that $p_{qx} < 0$ - can be generalized.

Asymmetric information

The issue of quality levels becomes more "delicate" when we consider asymmetric information[7]. This term (in the context of quality choice) can be referred to a number of different situations, and we will focus in particular on two of them, depending on whether the quality is produced before the product is purchased (unknown characteristic) or after it (unknown action, common in services and thus relevant to our problem).

Let us start from the case in which the (pre-determined) characteristic of the good is unknown to the buyer. The problem was raised by the classic paper by George Akerlof (1970). Let us quickly review his result.

Consider a market where the quality levels of the goods supplied are given. When sellers know the quality of their product while buyers do not, there will be only one price for goods of high and low quality. Therefore, high quality firms receive an insufficient reward. This means that asymmetric information reduces (i) the volume of transactions and (ii) the average quality of goods exchanged. The existence itself of the market for high quality goods is put into question. The "adverse selection" operated by market competition is seen as one of the main (potential) market failures regarding quality choices; the pervasiveness of informational problems in financial markets makes it necessary to focus on these issues in particular detail.

The main question is: to what extent is the market by itself capable to overcome the main consequences of informational problems? The answer must by necessity be complex, as it largely varies with the features of the good sold. Given the type of uncertainty we are considering, three types of goods can be distinguished[8]:

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[4] Stiglitz (1994) correctly stresses how asymmetric information should be considered the normal reference point, while situations of complete and symmetric information should be treated as highly "special".

[8] See Nelson (1970) and Darby and Karni (1973). The distinction between these categories is not as clear cut as the definition might suggest. Search might be possible, but in practice too costly. Personal experience does not help unless purchase is sufficiently frequent; other consumers' viewpoint is irrelevant

- search goods, for which asymmetric information on a good's features can be eliminated before consumption takes place paying a "search" cost;

- experience goods, for which only consuming the good one can become aware of its features[9];

- credence goods, for which neither before, nor after consumption the quality of the good becomes fully known to consumers.

In all cases, some inefficiency at least in the short run will emerge[10]. However, the main issue to our end is whether the market itself is able to eliminate the aforementioned failure, giving producers the correct incentives to provide quality and inducing potential customers to buy.

With search goods, the existence of asymmetric information creates an additional cost for consumers; because of this, the search process typically stops before full information is achieved and firms have a lower incentive to produce quality, proportional to the difficulty of search. This is pretty obvious and "banal" distortion, and we will not devote much attention to it. From the policy viewpoint, however, notice that when a good's quality can be detected before consumption consumers protection can be achieved at a (well defined) cost, and the only issue is the definition of benefits and their comparison with such a cost. The relevance of this scheme is probably high when it comes to information on aspects of a product which can be objectively and precisely defined: it is no surprise that the main application of this idea is to situations where a certain good's can be offered at different prices which a consumer can discover "shopping around".

Notice that often these models indicate how "informative" advertising, by increasing consumers' information, can increase welfare. Furthermore, as advertising reduces product differentiation, it also reduces firms' market power and profits. Thus, the prohibition of advertising in certain professional services can be seen as a device to help collusion, rather than something inspired to protect consumers.

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when tastes are not correlated. Some degree of uncertainty over a good's (objective) quality is probably always present even after consumption, so that the distinction between "experience" and "credence" goods is more a matter of how much uncertainty consumption can really dissipate. To say the least, the application of this taxonomy will require a considerable care.

[9] Notice that this can be either through personal experience or - in certain cases - through "word of mouth".

[10] Tirole (1988) points out that equilibria are not even efficient in the sense of constrained Pareto efficiency, i.e., given the distribution of information among individuals.

The cases when the product's characteristics cannot be discovered before consumption are certainly the more relevant ones, especially as the most interesting features of a products are probably difficult to define without a (more or less) direct experience[11]. In these cases, the more relevant issues seems to be to what extent this mechanism provides the correct incentives for firms in the determination of quality levels.

What several "experience" models indicate is that there is a plethora of equilibria, one of which is a full-revelation equilibrium, in which - in the long run - an equilibrium where qualities become known to consumers and producers earn a quality premium (pricing above marginal cost) is achieved [Klein and Leffler, 1981; Shapiro, 1983]. A similar result emerges in signaling models, or when the producer can provide warranties.

One first remark of this mechanism is the following. The reason why firms have an incentive to produce goods of a consistent quality is that whenever they "cheat" consumers will punish them by refusing to repeat the purchase. First of all, it is important to stress that - for this mechanism to work - repeated purchase must be possible. In other terms, the product cannot be too expensive, and the poor performance of a purchase must not eliminate the possibility for the customer to buy again (which is not a banal condition in financial markets).

However, the main limitations of these results are that

1.   many other equilibria exist;

2.   the result holds only in the long run.

Let us analyze the two problems in sequence

Too many equilibria ?

Following Stiglitz (1988), the punishment of a firm is a sort of public good, that raises the usual free rider issue. The punishment is individually rational only if a consumer is convinced that the firm keeps "cheating"; otherwise, given that all other customers are punishing a certain firm a consumer would not have any reason to do so. Therefore, the issue of expectations formation is crucial.

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[11] Notice that very often in the case of (e.g., financial) services the quality of the good purchased is not observable before the customers decide to buy it; indeed, in that case the actual production typically takes place after the service is acquired, which is the most extreme case of (ex-ante) unobservability (on this see also Shapiro, 1986). Several authors - quite rightly, in our view - agree in classifying financial services as credence goods (e.g., Mayer and Neven, 1991 ; Gehrig and Jost, 1995).

The consequence is that the equilibria analyzed - for instance - by Shapiro (1983) are "bootstrap" equilibria, base on self-fulfilling expectations: producers behave in a certain way because consumers' expectations are what they are, and vice-versa. The multiplicity problem is obviously intrinsic to this type of models. However, these models say very little on how expectations are build. Following again Stiglitz (1988), we could observe that

> "If one constructs a model in which no one ever cheats and sells lousy commodities, then how are individuals to form expectations...? ... Moreover, firms in deciding whether to cheat, must form expectations concerning the consequences of their cheating. To do this, they must guess how consumers will respond. Again, if in equilibrium no shoddy commodities or no cheating ever occur, they have no basis for forming their expectations." [p.824-25]

In the presence of multiple equilibria, a selection device is required, possibly based on an explicit learning mechanism. However, given the interaction between the learning processes on both sides of the market, it is difficult to see how this could eliminate the multiplicity problem. Using concepts form evolutionary game theory would probably represent a preferable alternative, in that it often allows to narrow down considerably the set of "reasonable" outcomes, allowing one to link the final equilibrium to well defined initial conditions. This latter aspect is the potentially main weakness and - at the same time - strength of this approach; only if one is able to "tell a story" on where market dynamics starts from, do evolutionary arguments really help understand the future evolution of the market itself. As our focus in on financial markets and more precisely on the (Italian) stock market, this line of research might provide quite useful insights. We will go back on this later in the paper.

Why should we care about the long run ?

Even if we really believe that the "efficient" equilibrium will eventually be reached, we have to admit that this might be the case only "in the long run". The vagueness of this expression calls for careful use especially for policy purposes[12]; in particular, it is worth pointing out the following.

One problem that has only recently attracted the attention it deserves is the one of the speed of convergence towards an equilibrium. This requires specifying an explicit learning process and clarifying what has to be learnt. The latter is typically the trickiest

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[12] Not by chance, Keynes reminds us that the only thing we can be sure of about the long run is that we are all going to be dead.

problem; indeed, while we already know something on the convergence when only one parameter is initially unknown[13], we still know very little on situations in which economic agents have to learn several parameters, whose values change over time [which is unfortunately the most plausible representation of numerous markets].

Secondly, the population changes, and this interferes with any learning process. This is true of agents on both sides of the market, but is especially a problem for sellers. It is not very useful to know that in (say) ten years you will learn everything about people who are now in the market, if these people are not going to be in the market any more. The mobility from one market to another is considerable, and we know that reputation does not always spread from market to market. One agent could be tempted to "cheat" the market as long as possible, and then to abandon it moving to a different activity, or trying to "reappear" in the same market under a different "commercial" label (even if firms' names are usually well known, their administrators' are often not). Another reason for population changes is that if the convergence process takes too long, people might be tempted to drop from the market because they have lost confidence. This is also related to the Grossman - Stiglitz (1976) problem of the impossibility of informationally efficient markets: if people tend to free ride and not to acquire information in the short run, who will lead the learning process ?

Finally, there is the intertemporal problem we have already mentioned. First of all, before we learn we run the risk of incurring into losses, and the expected loss may be larger that the future discounted gain (when we learn "who is who"). Without adequate guarantees, the incentive to engage in a costly learning process may be absent. Moreover, future gains depend on the sum we can invest. If we have losses in the short run, we may not be able to invest anything later. Thus, full information might arrive "too late".

Therefore, knowing that in the long run the learning process leads to full information may not be enough to convince investors to remain in the market. The "short run" problem remains thus crucial. This supports the conclusion that we have a market failure which *potentially* justifies some form of public intervention[14].

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[13] Jun and Vives (1996).

[14] In line with this conclusion, see Tirole (1988).

3.   Quality regulation

Very little is written on the theory of quality regulation, and there are probably good reasons for this. In the first place, we have seen that we cannot even be 100% sure that with symmetric information a real market failure exists and in which direction it operates. Second, modeling quality competition in oligopoly is extremely complex and most models in the field simply by-pass the issue. Finally, all alternatives are intrinsically imperfect ones, and comparing (at most) second-best outcomes is quite hard.

The (apparently) most straightforward and reasonable type of intervention is the introduction of a minimum quality standard (MQS), that prevents firms from selling products of a quality level lower than the MQS.

The effects of the introduction of a MQS in an oligopoly have been studied within a complete information set-up and even in this context they are not yet well understood. With two firms, if the MQS is not too high social welfare increases (Ronnen, 1991, and Crampes and Hollander, 1995). However, a more plausible representation of market competition should allow for a larger number of firms, and the presence of intermediate-quality firms changes some relevant features of market competition in the presence of a MQS. The position of these firms is particularly difficult, in that when the lowest quality increases because of the MQS, they face a dilemma: if they do not increase their quality levels, they are "too similar" to the worst product, but if they do, then the distance from higher quality goods decreases. Whatever their decision, price competition increases, and might reduce or destroy the incentive to produce high quality goods.

In a three firm set-up, the MQS decreases top quality, average quality and firms' profits to such an extent, that social welfare is reduced (Scarpa, 1997). This result can also be interpreted as offering theoretical backing to the common suspicion that under certain conditions "excessive" competition can represent a negative incentive to supply high quality goods. This result is also somehow "worrying", in that it shows how public intervention could be a self-defeating remedy for imperfect market competition.

Other attempts to study quality regulation with asymmetric information typically avoid the complications arising from an explicit modeling of oligopolistic behavior and concentrate on market structures where the only market power firms have arises from

informational problems and where their strategies never come to the forefront[15]. The focus is (typically) on (long-run) equilibria where quality levels are eventually revealed and on the role of different types of intervention on such equilibria.

In particular[16], Shapiro (1986) compares licensing and certification. Licensing is defined as a form of *input* regulation[17] whereby only producers that satisfy a certain requirement on (human capital) investment are allowed in the market ; such investment is assumed to facilitate the production of high quality goods. "Certification" instead requires the public authority to provide consumers the relevant information on the amount invested (e.g., the length of the training period).

Therefore, licensing sets a minimum level of investment that all producers must make; as the provision of quality is made easier by this investment, this induces more producers to supply high quality goods. Certification reduces the informational asymmetry which remains in the period in which quality levels are not yet fully revealed; this reduces the incentive to make only a "small" investment, and, again, induces more producers to provide high quality goods. Both policies increase the average quality level[18], but the cost of doing so may be so high to reduce total surplus; furthermore, consumers with a low willingness to pay are typically worse off. Not surprisingly, even the results of the comparison are extremely mixed and yield no definite result.

An alternative - and indeed very traditional - tool for controlling quality is to impose liability on the producer in case the quality of the product/service provided is "not sufficient". Polinsky and Rogerson (1983) analyze the relationship between liability rules[19] and market power; the latter is important in that an industry where firms have

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[15] This is obviously a weak point, in that the existence of informational problems is known as the source of market power (Arrow, 1973), so that talking of perfect competition with informational asymmetries is somehow a contradiction in terms. Unfortunately, an analysis of oligopolistic competition with asymmetric information is not yet available.

[16] Many other contributions are not reviewed here, both because this is not the center of our analysis, and because the qualitative conclusions one can reach (in the direction we are interested in) would not be affected by enriching the list of references.

[17] Notice that this contrasts with Leland (1979) definition, which considers a direct output regulation through a minimum quality standard (on output quality).

[18] Notice that producers simply choose whether to produce high or low quality goods, but these quality levels are exogenous. What is endogenous is only the number of producers who decide to provide each quality level. Thus, the only effect of these interventions is to affect the product mix supplied, and not to affect quality levels as such. As there is no competition in quality levels, we do not observe any of the previously mentioned effects.

[19] These authors distinguish between strict liability, which fully insures consumers, and a no-negligence rule, which requires a firm to compensate consumers only if it can be shown that firms did not exert "sufficient" care in providing their service.

market power will react to the imposition of liability rules by restricting output to an excessive extent. Only with market power do liability rules have such a distortionary effect, so that in a fairly competitive environment a strict liability is optimal; with less competitive markets, liability rules should be made less stringent not to trigger a (welfare reducing) reaction of firms[20].

In a richer set-up, however, Shavell (1984) points out that neither liability rules nor the regulation of product quality may be sufficient. In this context, regulation is defined as a minimum care that the firm should exert (in this sense, it is a sort of input regulation); however, this is an imperfect tool, in that the regulator cannot observe the magnitude of the harm each customer suffers in case the product "fails". In general, thus, the joint use of both means of controlling quality turns out to be advantageous, a conclusion widely in accordance with observed arrangements.

To sum up, none of the alternatives considered seems to guarantee the effectiveness of public interventions. There is little guarantee that quality regulation increases social welfare or the average quality of the products; distributional problems may arise, in that consumers with a lower willingness to pay are often penalized by a quality-increasing regulation; when informational asymmetries involve the regulator's ability to observe quality levels or to enforce rules, the power of regulation is reduced even further. Furthermore, notice that the previous (not too satisfactory) results are based on the assumption that regulation is carried out by benevolent policy makers, whose objective function is nothing but social welfare. The literature on regulation, however, reminds us that the regulator might be captured by the producers (Stigler, 1971) or at least that he might have private objectives, and that the interventions of the political authority might be at least partially determined by the influence of pressure groups (Becker, 1983). It seems pretty obvious that in such cases public regulation will achieve even less impressive results, and - although we will not further elaborate these well known arguments - we will have to keep these possibilities in mind when drawing any policy conclusions.

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[20] The conclusion that seem to emerge is thus, that the law should be strong against the weak, and weak against the strong. Although formally correct, one wonders to what extent such principle can really be implemented.

4.   The theory of self-regulation

As pointed out by the recent literature on regulation, the asymmetric information problem does not involve consumers only, but the regulator as well; producers know their business better than anybody else and regulating a market means giving a substantial power to a body that may not have enough information to use that power properly. Furthermore, regulation is a formal process where sanctions may be imposed onto firms only if there is sufficient evidence that they have not complied with some norm ; many variables, although somehow observable, are not easily verifiable by a third party, so that a court may not be able to punish improper behavior. Finally, the formal process of regulation may not be flexible enough to keep up with the pace of change in particularly dynamic markets.

The main question that studies of self-regulation should try and answer is : to what extent can an agreement among producers themselves overcome the limitations that market competition and regulation inevitably suffer from? The traditional arguments that might support Sr as a sensible alternative to outside regulation can be obtained looking at the above list of limitations of formal regulatory processes. Insiders have better information on market conditions and on the behavior of other firms; SR can be designed as a less formal process, with the double advantage of lesser reliance on formal procedures and evidence and of greater ability to adapt to exogenous market changes[21].

This (theoretically as well as empirically) important issue, however, has been object of formal analysis only very few times. To the best of our knowledge, the relevant (formalized) literature on the subject consists of little more than four published papers and an (unpublished) dissertation[22]. Furthermore, some of them simply ignore the reasons why SR might make sense, and simply look at the consequences of its existence. Finally, as we shall see, many of the desirable features of a model with SR are still absent from the analysis, so that the application of existing results still requires considerable caution.

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[21] Last, but not least, as regulation has a cost, SR has the advantage of internalizing this cost, and probably the ability to minimize it. Unfortunately, so far this aspect is absent from the theoretical literature.
[22] Early empirical studies of quality self-regulation in trade associations, farm machinery industry, computer industry and entertainment television can be found in Caves and Roberts (1975)

The first point to bear in mind is that self-regulation will never go against the interest of the (self-) regulator, i.e., of the firms involved. Indeed, many times SR is simply seen as the intervention of producers either as a cartel (whose objective function is joint profit maximization) or as a cooperative (maximizing profits per firm): the latter is probably a more reasonable alternative if the number of firms is pre-determined when SR is introduced.

Furthermore, notice that the term self-regulation might mean either self determination of rules or else self management of the application of exogenous rules. The two aspects are in principle different, although no rule is probably so complete, not leave sufficient margins of discretion in its application. Although in the literature we review such distinction is never explicitly introduced and analyzed, when drawing the conclusions the difference might turn out to be important.

Self regulation when quality levels are exogenous

The first - and probably easier - issue tackled by the theoretical literature is the one of SR in the presence of exogenous quality levels on which there is asymmetric information between consumers and producers. In this set-up, the most natural issue to address is the one of fixing a quality level that allows potential producers to actually act in the market, i.e. the problem of setting a minimum quality standard, such that only producers whose quality is above it are allowed to sell. The relationship between the MQS set by a self regulating organization (SRO) and the socially optimal one thus comes to the forefront.

The first model that explicitly addresses this issue is Leland (1979) within a typical Akerlof-type model. On the demand side, consumers' willingness to pay depends on average quality (as individual quality levels are not observable). On the supply side, it is assumed that the opportunity cost of supplying a good of given quality increases with quality itself. In the unregulated equilibrium, we have underprovision of quality (adverse selection).

The two main results Leland obtains are the following. First of all, the fixation of a minimum quality standard (L) increases welfare (relative to $L = 0$) if (i) the willingness to pay (i.e., price) is low for low quality levels and (ii) very sensitive to quality changes, if (iii) demand is rigid and if (iv) cost does not increase too rapidly with quality. Under

these quite intuitive conditions, then "some" MQS improves welfare. The second result regards the comparison between the MQS that emerges with SR and the optimal one. If the opportunity cost is convex in q and $p_{xQ} \geq 0$, then the self regulated MQS is too high.

These results are thus not very clear cut, which is not necessarily a problem, given the intrinsic complexity of the problem at hand. However, it is important to point out that some of the underlying assumptions raise some perplexity. The convexity of the opportunity cost in q is far from obvious, if one considers that it cannot be considered a real production cost, but rather the income a producer can obtain (i.e., the price he can command) in another market. Such remuneration is more likely to be concave in q, and this already weakens the previous result. Furthermore, the assumption $p_{xQ} \geq 0$ is not at all convincing, so that one should conclude that the MQS might well be too low, rather than too high from a social viewpoint.

Following some of these criticism, Shaked and Sutton (1981) develop a miniature general equilibrium model with two sectors, and in this way they endogenize the opportunity cost of supplying a good of given quality. One input (labor) must be allocated between the two sectors; there are N workers, whose labor supply is inelastic. Their skills (quality) are different and uniformly distributed in the interval [0, N].

The differences in skills translate into actual differences in output quality depending on the sector where labor is employed. People working in sector A (called "lawyers") differ in the quality of their output, while all those working in sector B (call them "workmen") produce a homogeneous output which does not depend on their skill[23].

Self-regulation (of "lawyers") consists of the determination of the minimum quality standard for lawyers, i.e. of a skill level L such that only N-L people can exercise the profession, while the remaining L have to go and work as generic labor force. This structure contains an important assumption on the effects of SR : as quality levels are given, setting a MQS is equivalent to deciding the number of competitors in the sector. This means that any increase in the MQS entails a reduction in output (a price increase)[24].

The demand for professional services depend on the quality of the service provided. Consumers have identical utility functions, which eliminates the element

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[23] Thus, unlike Leland (1979), the opportunity cost of producing in sector A is independent on quality. Notice that this entails a *loss* of generality.
[24] Scarpa (1997) shows how this assumption may not hold when quality levels are chosen by the producers and not given.

ambiguity intrinsic in the sign of p_{xQ}. There is asymmetric information on the quality of each lawyer, which is unknown to consumers, and thus demand depends on the *expected* quality of the profession $\bar{q}(L, N)$, which is assumed to increase in both arguments (a slightly more general formulation than Leland's). Thus the higher the MQS, the higher the quality level consumers expect[25].

The MQS is decided autonomously by the self regulating organization in order to maximize per seller earnings of its members. This implies that the monopolist SRO works as a sort of "illyrian" labor managed firm, and we know that this type of firm has a tendency to reduce output even more than a profit-maximizing monopolist would.

Thus, it is not surprising that the main result obtained by Shaked and Sutton is that the MQS set by the SRO is too high from a social viewpoint. Indeed, notice that an increase in L by one unit has two effects on social welfare. On the one hand, it reduces the output of lawyers by one unit, while on the other one it increases the average quality of the profession. The incentives of the SRO to increase L are such that in equilibrium the former, welfare reducing effect dominates the latter.

Notice that the assumption that the opportunity cost of suppliers in sector A does not depend on quality is crucial to this result. Indeed, we cannot have any problem of adverse selection: given L, all producers whose quality is above L will stay in the sector, and none will be tempted to take an outside option (which might be the case if the opportunity cost of staying in the market increases with the skill of the producer). Another crucial aspect is the fact that all consumers are identical, which assumes away all ambiguities on the demand side, that instead were present in Leland's model[26].

Self regulation with endogenous quality levels and moral hazard

As argued in the introduction, the issue of controlling *behavior* and not just innate *characteristics* is at least as important, and probably more difficult. In this set-up the main issue is no longer the study of the consequences of SR, but the analysis of the conditions under which a SRO can be able to enforce a control on its members.

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[25] Notice that when quality levels are endogenous and information is symmetric the average quality of the product does not necessarily increase with the MQS (Scarpa, 1997).
[26] Furthermore, the assumption that the SRO works as a cooperative means that the tendency to reduce output is stronger than in Leland's model; however, this assumption is probably more plausible than joint profit maximization.

The paper by Shapiro (1983) - already discussed in section 2 - does not contain any indication on the activity of a SRO, but it can be used as a basis to understand the role of self regulation with moral hazard when experience matters. In that set-up, regulation may only serve two purposes i.e. accelerate the detection of quality and increase the minimum quality level. Notice that both things reduce the quality premium, i.e. the price-cost margin that firms obtain in equilibrium as an incentive to produce goods of a quality higher than zero. Indeed, if quality is detected immediately there is no need to provide incentives not to cheat and competition should drive prices down to marginal costs ; in the same way, the higher the minimum quality that can legally be produced, the lower the risk run by consumers, and the lower the compensation that firms obtain in equilibrium. Therefore, it is easy to conclude that the SRO would not help detection of high quality products and that it would set too low a standard.

Two more instruments for regulation are suggested by Mayer and Neven (1991), who consider an industry where N potential firms have innate quality levels θ_i . The quality of the product they offer can be either θ_i or zero (which identifies cheating). Firms are endowed with a capital C_i which is positive correlated to θ_i . In order to control quality, it is assumed that there are two instruments, capital requirement (CR), which represent e pre-requisite all active producers must satisfy, and a fine (of fixed amount U) imposed on cheating firms. The rationale of the capital requirement lies in the relationship between capital and quality; eliminating all firms whose capital is lower than a certain level entails eliminating "intrinsically bad" producers.

If a firm cheats, it earns a higher gross profit, but it is discovered with probability 1, it loses its capital C and must pay the fine U. However, there is a positive probability that the same loss is wrongly imposed on firms who are not cheating. This imposes a trade-off, in that honest firms cannot be sure that they are not going to be penalized; thus, increasing CR means eliminating from the market some firms that are going to cheat, but some honest ones as well. Raising CR to the level where no cheating takes place means excluding too many honest producers, and thus using the fine as well is necessary.

With SR, firms may join a SRO by paying CR and committing not to cheat consumers. If they cheat, they lose their capital and pay the fine (as above). Is the SRO going to enforce these penalties, and is SR going to require less or more capital than

standard regulation? On this point, the analysis leaves a lot of questions open[27], while the discussion becomes probably too informal.

External regulation may be inferior to SR also because it requires the third party verifiability of cheating, while with SR its generic "observability" can be sufficient, given the more informal nature of the procedures adopted; this aspect is only mentioned by Mayer and Neven, while it is at the core of the analysis by Fletcher (1993) with a clearer microeconomic foundation. In particular, quality levels θ_i are assumed to be observable but not verifiable, and the SRO - unlike the external regulator - is assumed to be able to impose different fines to firms of different innate quality levels. In this case, regulation entails welfare maximization under the constraint that quality levels are non-verifiable, while SR involves profit maximization under appropriate incentives that the regulator can give to the SRO.

Without going into the formal details of the model, which extends and clarifies some features of Mayer and Neven (1991), it is worth noting that this paper introduces an explicit distinction between "cheating on quality" (i.e., providing a service of zero quality when innate quality is higher) and fraud (an additional damage consumers may suffer, for instance, because the firm runs away with its money). These ways to exploit consumers are substantially different, in that cheating on quality gives a reward equal to the price paid by consumers[28], while fraud entails a reward independent on price.

This allows one to distinguish different cases. When cheating on quality is the main problem, the highest level of regulation would be required by high quality firms, in that the price they can get (i.e., the reward they would get from cheating) is higher, and so is their incentive to cheat. On the contrary, when fraud is the main problem, it is the low quality firms that need the toughest regulation. Thus, the ability of the SRO to condition its interventions on quality makes the SRO better equipped to design an "optimal" structure of fines.

Given the superior ability of SR to condition its interventions on quality, it is also fairly intuitive that SR may achieve a better result in terms of the range of quality levels admitted in the market. With external regulation, punishing cheats on quality is more difficult, and so product variety will be smaller, while the better ability of the SRO to

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[27] We refer to Fletcher (1993) for several criticisms on this part.

[28] The reason is that for a zero quality product consumers would have been willing to pay zero.

observe behavior may allow it to admit a wider range of firms (which is socially beneficial, given the heterogeneity of consumers' willingness to pay).

Finally, it is interesting to see that SR is more likely to be welfare improving relative to external regulation as

i)   fraud becomes more important. This is a consequence of previous remarks; in this case low quality firms should be monitored more closely, and the ability of the SRO to condition its decisions on θ is socially advantageous.

ii) sellers are more homogeneous. This depends on the fact that the SRO maximizes the profits of its members; intuitively, the idea is that when the members' interests tend to coincide, its job is easier.

iii) the observation lag is longer. This is because a long observation lag implies that consumers are less able to punish cheats by refusing to repeat the purchase, and so the role of SR and its ability to intervene taking θ into consideration become more important.

iv) the demand becomes more elastic. This latter condition is easily understood, in that the SRO pursues profit maximization, and the output reduction is smaller when demand is more elastic.

In the model developed by Gehrig and Jost (1995) the N producers operate in N separate markets (a device to by-pass the problem of competition among firms); in each market there is an identical number of potential consumers (normalized to 1). The structure of the game is the following. In $t = 0$ firms decide their quality levels (q) that are known to all firms, but unknown to consumers ; this choice cannot be reversed. In $t = 1$ consumers decide whether to buy one unit of the good or not to enter the market. Only after consumption do consumers become aware of the quality of the product they have consumed. Direct experience is the only means of learning. In $t = 2$ each consumer knows the quality of the good it has consumed. The market game is now repeated, but with an important change: a proportion λ of consumers of each market "migrates" to other markets (mobility from one firm to another), so that in each market we have consumers

who know the quality of the product, and others who have no experience of the product offered in their "new" market[29].

This highly stylized structure captures a few interesting elements. The first one is the mobility of consumers (the "migration"). The second one is the relevance of reputation. The third one is the assumption that the learning process is imperfect, such that in period 2 each firm faces some consumers who "know" but others who "don't know"; therefore individual reputation is not the only thing that matters, and the SRO's reputation acquires relevance. Unfortunately the proportion of mobile consumers is totally exogenous, and in particular it does not depend on how consumers are satisfied with their initial choice, i.e. on the behavior of producers; this is probably the least acceptable assumption of the model.

Then the paper analyzes SR, which is managed by a SRO, which accepts as members all producers who supply a good whose quality is at least equal to some minimum standard q_{SR} and perfectly monitors its members.

Consumers know this, i.e., know that if a firm is member of the SRO its quality level will be (greater or) equal to the standard, while if it is not, it will be equal to q^*, the unregulated profit maximizing quality level. The question is whether the SRO has sufficient incentives to expel non complying firms, i.e., whether complying firms have an incentive to punish deviations. The paper assumes that the reputation of the SRO depends on this, i.e., that migrant consumers will form their expectations on the quality of the "new" firm in the following way. If the firm they buy from in $t = 1$ is part of the SRO, they expect $q = q_{SR}$. If their expectation is confirmed, they believe in the SRO; otherwise they believe that all quality levels are equal to q^*.

This is important because of the migration of consumers from one market to another. In period 2 each firm (in particular, those belonging to the SRO) "receives" $\lambda/(N-1)$ consumers coming from each other market; if they believe in the SRO, then they expect from their "new" firm a quality level $q = q_{SR}$. If the SRO has not expelled a firm with $q<q_{SR}$, consumers who have been "cheated" will believe that the new firm will supply only quality q^*. Thus it is in the complying firms' interest to expel deviant firms;

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[29] The distribution of "migrants" to other markets is such, that the number of potential consumers in each market remains constant: a number $\lambda/(N-1)$ of consumers goes from market 1 to each other market, and so on.

notice that this is purely a reputational effect, as the structure of the model assumes away any direct competition[30].

Thus, SR functions if for each producer the incentive to expel deviant firms is large enough relative to the reward from cheating himself. This indicates that SR is "feasible" when the mobility of consumers is large enough (so that the SRO's reputation is important to each "obedient" firm) and when the number of firms is not too large; indeed, if N is very large the number of dissatisfied consumers will be excessively "diluted", in the sense that in t=2 each firm will face a very small number of consumers coming from each other market, and the punishment of each deviant becomes less crucial. Notice that this way of reasoning resembles very closely the classic public goods argument against "excessive" competition (Oakland, 1987).

Another relatively straightforward result is that SR is likely to be preferable to regulation if the regulator's uncertainty about the firms' costs is substantial enough. In such a case, the strong point of SR would be a greater ability to observe firms' characteristics.

The difference between models with exogenous quality (Leland and Shaked-Sutton) and these models (where quality is a choice variable) is that here the strong result that the self imposed MQS is set too high from a social viewpoint disappears. This is no surprise, in that if quality is costly to produce it seems natural to have an effect in the opposite direction.

Which type of model is more relevant, however, is an open issue. If SR is introduced when the professional group is already operating, it is possible that quality levels were chosen long time ago, so that at the time when SR begins they are given. Thus, the real question mark is to what extent quality choices of already established producers may or may not be changed.

As for the comparison between regulation and self regulation, we are dealing with imperfect alternatives (and not necessarily even second-best alternatives !) so that only with highly specific assumption is it possible to say something precise. The more relevant conditions for the "feasibility" (or effectiveness) of SR are probably those emerging from the Gehrig and Jost paper, but even in their framework the comparison with standard

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[30] In a way, this mechanism anticipates the idea of collective reputation, later introduced by Tirole (1996).

regulatory schemes does not go much beyond the analytical proof of a fairly common intuition[31].

Self regulation in financial markets

Although not directly linked to the formal literature on SR, two more papers have particular relevance to the present discussion as they refer more directly to financial markets. The paper by Fischel and Grossman (1984) is probably the first one to develop (although very informally) the theme of SR in securities markets. Their analysis relies on a clear and almost dogmatic "Chicago view" that customers are in principle perfectly able to defend themselves, despite that informational problems are formidable ("those who are uninformed always have the ability to become informed", p.289), and in particular that the measurability of the intermediaries' service is extremely difficult[32].

In their view, the stock market naturally provides incentives to coordination, in that "the ability of any single firm to attract customers depend on the overall quality of transaction services provided by the exchange" (p.290). Thus, Fischel and Grossman argue that SR could be a natural answer to the problem of customer protection. This is because they assume that the exchange's interest is to maintain its reputation for fairness and thus to maximize the possibility of competition among intermediaries. Fischel and Grossman's answer to the problems of self regulation is that if there is enough competition among exchanges, all attempts to restrain competition within a stock market will be defeated (or self-defeating).

One problem is that we still know very little on how competition among markets takes place and on what efficiency properties it has. Furthermore, the quality of a stock market largely depends on how many traders operate in it, which determine market liquidity ; this implies that it is extremely difficult to challenge the leadership of a market (as long as many traders are there, many others will stick to it) even if the service provided by its intermediaries may not be satisfactory. On the other hand, the common perception among practitioners is that competition among exchanges - at least within

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[31] To compare the different alternatives, one other possibility would be to generalize the framework suggested by Shapiro and Willig (1990) in the attempt to compare regulation and privatization, but even their set-up does not seem terribly promising.

[32] We have already stressed how many authors agree on considering financial services as credence goods, i.e., goods whose quality may remain unknown to the customer even after purchase. In this situation even greater information acquisition is not very valuable, and the ability of customers to monitor intermediaries is limited. This possibility is never mentioned by these authors.

Europe - represents a substantial pressure over national markets. A deeper understanding of these processes will certainly help understand the proper role of national and supra-national regulatory approaches.

Another problem with the Fischel and Grossman's set-up is that it is not clear who actually decides on regulation. Although they admit that self-interest of individual members of the stock market might conflict with collective interest, their assumption is that such problem "is resolved by the members bargaining among themselves until a strategy that maximizes the sum of their wealth is achieved" (p.293). This pseudo-answer is extremely unsatisfactory, in that it rules out *a priori* any inefficiency and assumes away most interesting issues[33].

The second paper is the one by Hart and Moore (1996), who model the stock market as a firm. They compare two different governance structures, the cooperative one (which seems very close to the idea of self regulation) and some (not better determined) form of outside ownership. The output of the firm is the volume of transactions; on each transaction a price (intermediation fee) is paid and this decides the firm's income. The cooperative structure is assumed to have an informational advantage, in that monitoring of individuals' behavior is assumed to be easier than in a profit maximizing firm.

Building on fairly standard (possibly, too standard) arguments of theory of the firm, they conclude that outside ownership is relatively better (i.e., more efficient) as the distribution of the members' characteristics becomes more skewed, and that it is preferable as the stock exchange faces more competition. The idea is that profit oriented firms are better able to reach efficient decisions than cooperatives when the members' interests are very diversified, and that they are better at facing competition than workers' cooperatives. Their conclusion can be interpreted saying that SR can work if the group of agents running the stock exchange is sufficiently cohesive, but that at the presence of an increasing competition among exchanges a more profit-oriented management seems to guarantee a better performance.

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[33] The problem of customer protection is usually seen as a problem of guaranteeing "fair trade", but the definition of "fairness" itself is not easily provided. Grossman (1986) insists that "fair trading is trading which is volume enhancing". If we accept this definition, self-regulation can be optimal in that intermediaries are (*coeteris paribus)* interested in increasing the volume of trade. Of course, however, there is a potential free riding problem, in that if an intermediary "cheats", he enjoys the profit of his activity, but does not bear the whole cost, in that he runs the risk of reducing the *global* volume of trade. This externality, pointed out by Gehrig and Jost, might seriously hinder the possibility to reach an agreement among intermediaries.

The framework by Hart and Moore is a useful reference point, but it does not seem completely satisfactory. In the first place, if we have outside ownership (when the exchange is not controlled by intermediaries) we do not have the informational benefit of self-regulation, and there seems to be little guarantee that no outside regulation is needed.

Furthermore, the analogy between a stock exchange and a firm is not completely convincing. Unlike a workers' cooperative, the income (and in general) the utility of the members does not only depend on the firm's performance and on individual effort, but also on competition among the members of the market. A stock exchange can be modeled as a cooperative firm only if workers' remuneration is determined on a competitive basis (on the basis of rather extreme relative incentive schemes); this is not true in general, however, and even less in workers' cooperatives. Thus the incentive structure we ought to consider is different, and the analysis of Hart and Moore does not consider the competition among intermediaries. To what extent and in what sense this should change the conclusions is an issue that at present is still unexplored.

Possible extensions of the present literature

What is missing from the present literature ? The gap between theoretical models and application for policy purposes is always quite large, and it would be easy as well as uninteresting to point out the limitations of the stylized models we have analyzed. However, (at least) a few points are worth mentioning.

Although several authors agree that probably financial services represent a case of credence good, the models on SR (even when they have in mind financial markets) introduce some assumptions on observability of quality that clearly contradicts this opinion (and gives substantial room to reputation, consistent beliefs, observability and so on). This seems almost a schizophrenic attitude, that could be justifiable on the ground of the difficulty in dealing with credence goods, but that seriously undermines the reliability of the policy implications drawn.

The definition of the incentives for the SRO to punish "cheats" is still not satisfactory. So far, it has been assumed that a SRO will punish the deviant for fear of losing its reputation *vis à vis* the consumers. Although this is correct, we believe this is not the whole story.

When the SRO punishes a member's behavior, it makes it public that a member has kept a line of conduct that SRO members declare to refuse. In so doing, the SRO gives a signal to the market, in that it says something on what can be considered acceptable, and what cannot. The problem is that it cannot tell the market how far that member's "actual" behavior was from "acceptable" behavior; in other terms, investors, observing that firm's behavior might revise (downward) the expectation of what other firms might be doing, of the "general practice" of the profession.

In a similar way, following Vickers (1991), one could argue that informing all customers that a firm does certain things, the SRO informs all customers of what a member could hope to do without being detected or punished: "exposure might be a negative signal about the average quality of remaining members" and "a sign that the fraudulent member thought that vigilance was low enough for there to be a reasonable chance of getting away with it". Thus, a SRO might have an incentive to cover-up deviations of its members in the fear that such a public knowledge of such deviations might harm even its honest members.

In our view, a satisfactory representation of a SRO's incentives to intervene should comprehend both effects, representing the SRO's decisions as emerging from the attempt to strike a balance between (i) the risk that the information spreads anyway, which would damage the reputation of the SRO and (ii) the risk that all SRO's members suffer from a reputational externality when the fraudulent behavior of one member is made public.

Furthermore, the issue of membership to a SRO and possibly of competition among different SRO should be paid more attention[34]. The two aspects are closely related. As for membership, there can be different cases, such as

i) (compulsory) membership of the SRO as a requirement for operating in the market [this is the implicit assumption in Leland (1979) and Shaked and Sutton (1981)]; in this case, the SRO plays a semi-public role with relevant formal power;

ii) optional membership, in which case the SRO simply guarantees the quality of member firms [as in Gehrig and Jost (1995)]; here the SRO plays a relevant role with respect to consumers, but a firm can operate without being member;

iii) obligation to join one of several competing SRO (as under i));

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[34] Fletcher (1993) provides a first attempt to model this important aspect.

iv)   possibility to join one of several competing SRO (as under ii)).

The implications of each arrangement are still largely unexplored terrain, and further analysis - although far from easy - would be extremely helpful to focus on the policy issues at stake.

5.   Conclusions

We already pointed out in the introduction how difficult the application of theoretical principles can be. This is even more true in this case, as the contribution that so far economic theory can give to the analysis of self regulation is certainly not spectacular (although it should not be underestimated). Therefore, most of the present discussion of the results and of any attempt to draw some (extremely tentative but hopefully significant) conclusions will have to bring together some carefully developed specific arguments, some arguments borrowed from other fields of economics, but also indicate some directions for future research. We hope that this attempt will at least stimulate some further reflections on behalf of scholars who are better equipped to argue about institutional aspects of financial markets and their possible regulatory reforms.

At present, countries that traditionally relied very heavily on SR (e.g., the UK) are going in the direction of a re-balancing of powers, given the increasing dissatisfaction with the recent performance of SR[35]. It is interesting to see that this is not a phenomenon peculiar to the UK or to financial markets[36] ; probably many markets are becoming increasingly open to competition, and this seems to conflict with self regulation.

Self regulation is not new in the Italian legislation, as it was in force - in different forms and with a variable distribution of powers - until Fascism (Baia Curioni, 1995). The recent history, however, is one of considerable centralization and controls, in which "stability" had a prominent role relative to goal to develop the stock market, that indeed maintained a marginal position in the Italian system[37]. The past experience seems to

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[35] Annunziata (1994).

[36] Moran and Wood (1993) stress how a similar problem is emerging in Germany with the SR of the medical profession.

[37] This is a clear indication of the Italian regulatory culture in financial markets. In this respect, we can say that one of the main problems is how to look at speculation and the extent to which speculation is considered an enemy of the stability of accumulation. In Italy speculation has traditionally had a very

suggest that SR might work as long as the group of agents exerting this power is relatively small and cohesive. Thus, as indicated by the Italian experience after unification and by the British experience of the last decades, it is not a good idea to associate a liberalization of the activity of intermediation to an increase in the power of intermediaries on market governance. Liberalization entails a break-up of previous equilibria, and - at least at the beginning - an increase in the number of agents; given the already mentioned reputational externalities and the nature of public good of SR, this increase in competition is likely to worsen the ability of intermediaries to keep control of the market[38]. Notice that the models by Mayer and Neven, Fletcher, Hart and Moore and Gehrig and Jost, although for (several) different reasons, all reach a similar conclusion: SR is more difficult and less effective when it involves a large and heterogeneous group of agents.

A further aspect that should be kept in mind is the following. Situations in which reputation matters (and even more when *collective* reputation matters) typically lead to multiple (bootstrap) equilibria : what agents to depend on what others do and expect, and so on. Knowing that there exist equilibria with certain features does not mean that there are not other equilibria with less desirable properties. Where does the market go ? How can we decide which equilibrium is more plausible ?

Arguments borrowed from the theory of evolutionary games suggest that the starting point is crucial ("history matters") in that what agents do and expect now largely determines the relative profitability of different types of behavior, and hence the direction in which the market is going to move. In other terms, given current habits, current expectations of agents and so on, is self regulation likely to lead us in the desirable direction of market development and so on? Or is the attitude of agents in the Italian stock market (intermediaries, investors, and so on) such, that opportunistic behavior is more likely to be rewarding and to prevail, pushing the "snowball" in the wrong direction?

These are difficult questions, and we do not believe that an obvious answer exists, but we have to remember that any decision on the matter at hand can be right or wrong,

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negative connotation, while "stability" has been the key word in the regulation of financial markets (on this and other related issues, see Baia Curioni, 1995).

[38] It is well known that externality and public goods problems increase with the number of producers [see Oakland (1987) for a rather complete survey].

depending on what the correct answer is, and it should thus be based on the serious consideration of this issue. Clearly, this has to do with the current "culture" of agents on all sides of the market, and we cannot expect such culture to change promptly when a new regulatory regime is introduced. A gradual and cautious approach is thus preferable.

As for the allocation of competencies between SRO and the stock exchange authority[39], the theory seems to indicate that delegating to the SRO the control of the criteria for the admission to the profession is not an enormous problem, as long as quality is endogenous[40]. As for the opportunity to give the SRO the control of market operations and functioning, the theory does not say much. To the extent that these operations are really "neutral", financial intermediaries could well be fully in charge of market management, while in other cases involving representatives of other interest groups (e.g., listed firms, potentially listed firms, buyers) might be desirable[41]. When the direct representation of a category seems particularly difficult (e.g., small investors) the role of the public authority remains particularly important[42]. This is true even more in general, given the existing question marks on the incentives of a SRO to enforce its own rules.

As for regulation of behavior *vis à vis* the investors, theoretical models indicate a number of pros and cons but - not surprisingly - never provide a definite answer. SR might be a solution only if one believes quite firmly in the ability of the market to learn product quality within a reasonable time, on the ability of investors and of the SRO to effectively punish deviations and thus discourage such behavior. We cannot conceal a substantial skepticism on these points, which again induces us to stress the relevance of maintaining some public supervision over the SRO.

What type of power should a SRO be given ? The question is not banal, in that one of the advantages of SR is the possibility to intervene in "not-so-formal" ways that a

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[39] We believe we can take for granted that not everything can be delegated to the SRO. A proposal for the division of labor in the Italian stock market can be found in Ferrarini (1996). Notice that also in other sectors (e.g., the medical profession ; see Moran and Wood, 1993) whenever some SRO is involved, there are other agents that intervene in regulating the market. In some cases the "countervailing power" is not a public one, but - especially in the US - it is an organization representing interests conflicting with those of the SRO (e.g., doctors v. insurance companies, in the specific case of the health sector).

[40] A common feature of SR systems even in other contexts is that entry regulation is typically quite formal, while other aspects of regulation are tackled in a much more informal way, probably as they are less easy to tackle than a simple in-or-out decision (Moran and Wood, 1993).

[41] Probably the control of competitive practices is one of the more delicate points in this respect.

[42] The direct representation of other interests is particularly relevant in systems where the protection provided by the legal system is weak (e.g., remember the outrageous length of time most legal cases need in Italy before their settlement). This is even more important with respect to small investors, with less bargaining power and worse information.

public body would not be able to use. But endowment of formal power and ability to use informal procedures are difficult to reconcile.

In many cases, it might be helpful to have so called State-sanctioned self-regulation (Moran and Wood, 1995) : a form of SR that operates with the support of State sanctions[43]. Although this can be a useful solution, it is not obvious to what extent this might be compatible with the present Italian juridical system, and anyway it raises problems of accountability. This is another crucial and in practice extremely delicate issue, in that the control over the operations of the SRO must be sufficient to ensure fairness, but must not be so heavy to neutralize self regulation[44]. Moreover, the existence of multi-tier regulation has problematic aspects. In the first place, when there are overlapping competencies it might be difficult to identify actual responsibilities, which represents a major risk. Furthermore, having different levels of delegation might be justifiable, but it entails the cost implicit in any complex agency relationship.

However, every time a SRO is endowed with formal power, its ability to use informal procedures is probably substantially reduced. If this is the case, its advantage on external regulation gets very small, and it might be worth considering the possibility to favor the formation of professional associations which simply certify the quality of their members without much formal power. In this case, having different competing organizations would seem a preferable solution.

A closely related point is to determine when it is more appropriate to rely on a complete self determination of rules or rather the self management of publicly decided rules. In the case of State sanctioned SR, we often have self-management of rules set from above, and the actual power of the SRO depends on the degree of "incompleteness" of the general norm. In turn this partially depends on a decision of the policy maker, sometimes on exogenous conditions (e.g., observability, predictability of states of the world, etc.).

The historian Braudel introduced a distinction between public and private markets. Referring to the present context, we can say that public markets are those where buyers and sellers meet within a public framework (regulation), while private ones are those where professional intermediaries manage the transactions. He also claims that the

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[43] Sometimes this form of distribution of power developed out of independent "pure" SR systems, that often face serious problems of control.
[44] We are perfectly aware that the practical application of this principle is far from obvious.

latter type tends to favor "asymmetric exchanges" where capital accumulation is spurred. Basically, both the limited theoretical results and reflections on history indicate that public regulation emphasizes guarantees and fairness, while private control (and possibly self regulation) tends to favor high (but risky) returns and capital accumulation.

This trade-off can hardly be escaped, as we have tried to argue, and the choice of the regulatory regime probably depends on a more or less implicit evaluation of what a country needs in a certain moment. Given the current underdevelopment of the Italian stock market, probably the main worry should be to attract investors and firms, that so far have not trusted the stock market. It is hard to see how a heavy reliance on self regulation could serve this purpose.

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Appendix

A sketch of some relevant facts in the history of Italian stock markets

between 1808 and 1945

(after that, things are probably quite well know)

Source : Baia Curioni (1995)

Before unification (1861) stock brokers (SB) were endowed with the formal monopoly of intermediation and had the status of public officers; they were responsible for a proper functioning of the market on behalf of the central authority, under the control of the Chambers of Commerce, that were local offices of the central administration, although *de facto* controlled by few local banks.

However, banks could also offer themselves to buyers or sellers as market makers *ante litteram*, operating in fact as competitors of the stock brokers. This means that we observe from the beginning a clear separation between what is written in the norms and what is observed in markets practices and that we have a conflict between stock brokers - who were not part of the Chambers - and banks.

The regulation of intermediation was meant to control the *qualification* of market operators (SB), rather than regulating their *behavior*. The nature of the admission into this group was extremely personal, so much that stock brokers were not allowed to operate on their own account and could not act through employees. This has two effects. First of all, creating a relatively cohesive group of agents whose history coincides with the history of the SM for long time. This group was mainly stable, with a strong control over members and the *status* often went from father to son. Second, the impossibility to operate through employees implies that the volume of activities of each agent was given. Thus, in phases of market expansion there was more room for new operators - often irregular ones, operating with a short run perspective. This introduced elements of potential instability.

After the unification of Italy (1861), things start changing as the national Government is relatively close to free-market principles; the group of intermediaries becomes larger, younger, its composition varies more quickly, and the average duration of their careers became shorter. Since the Seventies, in a phase of expansion, the history

of the Italian SM started being marked by episodes of failures of intermediaries who engaged in own speculative activities, affecting heavily the credibility of the whole category (whose association was fighting - with little power and effectiveness - irregular intermediaries).

In 1882 we have a regulatory reform, which leaves a lot of room to market operators. The central authority was only setting basic rules, whose application was left - with several degrees of freedom - to the local Chambers of Commerce. Stock brokers were made members of the Chambers of Commerce, but intermediation is relatively liberalized. Intermediaries acquired the dual capacity, despite the opposition of some scholars (e.g., the lawyer Angelo Sraffa) who point out how this introduces dangerous conflicts of interests with the clients.

With liberalization, the group of SB becomes less and less cohesive, instability within the group becomes the rule and internal conflicts prevail[45]. This reflects on (self-)regulatory bodies as well, whose instability leaves more room for fraudulent behavior. These conflicts have never found a synthesis in the name of a clear project for market development, and a consequence of such delegation to the periphery was the inability of local stock markets - too worried to solve local conflicts - to adapt to the variable international environment.

We have an increasing polarization between a group of large operators, linked to large credit institutions, that operate largely on their own account, and several small traders, that are mainly pure intermediators.

Towards the end of the century, technological progress, in the form of telegraphic connections among stock markets (SM), forces an acceleration in the process of integration among SM. The weak point remains Genova, where speculation is traditionally very strong, regulation is very weak, and where brokers' power is very high. In 1906 in order to rescue some operators from the bankrupt of a broker, other agents went on strike and refused to settle the transactions at the end of the month. [a clear example of self-regulatory failure].

At the same time, the power of large "mixed" banks increases, at the expense of small banks (linked to stock brokers), while their responsibility remains extremely

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[45] For instance, in Milan stock brokers find it hard even to agree on the exclusion of irregular dealers (Baia Curioni, 1995, p. 130).

limited. The process of polarization becomes clearer and clearer, although now all agents are somehow linked to banks of different sizes. This helps to regain an (oligopolistic) equilibrium inside the group.

The law of 1913 strengthens the principle of centralized supervision over local markets. The law explicitly emphasizes the need to "moralize" the market, strengthening the control over the profession (especially as for the capital requirements to guarantee investors). Stock brokers are allowed to operate *via* employees. These and other aspects clearly favor large brokers, i.e., large banks. The law establishes a clear separation between banks regulation and SM regulation, so that large banks enjoy the power without responsibility. Del Vecchio (1913, in "La riforma sociale") points out how this norm hinders competition, leading the Italian SM towards the German system, with the specific purpose to concentrate the market.

During Fascism, in line with the general fascist economic policy, we have an increase in centralization, with a loss of power of all agents. This affects in particular large banks, who had been given *de facto* power after 1913. Between 1926 and 1931 the Chambers of Commerce are deprived of any regulatory power. The 1936 Legge Bancaria establishes the principle of specialization of banks, that become unable to operate directly on the SM. The legislation remains very stable until the 1974 and 1991 reforms. This seems more than anything the symptom of an increasing separation between rules and practice.