

**An Incentive Structure for
Financial Regulation**

By

Charles Goodhart

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An Incentive Structure for Financial Regulation

Professor C.A.E. Goodhart
Financial Markets Group
London School of Economics¹

1. Introduction

Until recently, regulation within the financial field was primarily externally imposed upon the regulated. Using powers derived from statute, or from custom and tradition, (ultimately reinforced by the threat of statute), the authorities would impose regulations, e.g. cash ratios, limits on who could own financial institutions, constraints on connected lending, etc., etc., and then monitor and supervise in order to ensure that such regulations were met by the regulated financial institutions.

basic technology to formulate for themselves). Finally the speed with which portfolios, and positions, can be adjusted, e.g. in derivatives markets, make the occasional balance sheet snapshot less informative and reliable as a guide to that institution's potential risk exposure.

For all such reasons the weight given to the external regulatory mode has recently been declining, and by the same token the weight to be given to internal managerial control as not only the first, but also the most important, protection against imprudent or improper actions and positions has been increasing. In view of the growing importance of such internal control mechanisms, the question needs to be addressed whether there are steps, structures, that can be put in place to reinforce the incentives for all the parties involved, notably management, but also auditors and the regulators/supervisors to play their own roles efficiently in order to limit improper behaviour, excessive risk and systemic instability. The aim of this note is to make a start in this direction.

2. Failure to Comply with Agreed Procedures

Most control problems arise in spite of the existence of established procedures aimed at curbing excessive risk-taking, not because of a lack of understanding of what in principle should be done. The proper procedures within the institution are simply not followed, whether because of fraud, negligence, lack of due care, etc., etc. This was the case in Barings, Daiwa, and in many other such cases. Everyone knew that, in principle, the front and back offices should be strictly separated. The recognized principles and proper processes simply were not carried out.

One slight comfort is that such control failures, where such established procedures are simply not carried out in practice, are commonly isolated affairs, and thus less likely to be systemic in effect. Nevertheless if the size of the loss, or the damage to reputation, is sufficiently serious there may be systemic consequences; or if the failure adversely affects market operations, Herstatt and the FX market; JMB and the gold market?). Again, if the financial system is in a weakened state, an internal control failure and resulting insolvency may weaken confidence in other similar financial institutions.

In any case the argument that the control failure may not be systemic is no reason to condone it in any way. Obviously the main responsibility must lie with management to see that their own procedures are properly carried out. The supervisors need to ensure that appropriate sanctions are (self) imposed on the responsible management for allowing such control failures to have occurred.

Ensuring that proper control procedures are in place, and, when established, are carried out is now one of the main functions of the auditors, internal and external. The organization of the internal auditing function is primarily an issue in corporate governance, and governance structures vary from country to country. The key, perhaps, is to have the internal audit function report to a person, or to a small committee, which is both independent of the CEO, but with enough seniority and weight to

force the CEO to respond to any issues brought to their attention. This enables ultimate authority for internal regulatory issues to be identified, so that the locus of responsibility internally is clear. If the internal chain of command and locus of responsibility is clear, then there seems no good reason to force internal auditors to report also to the external supervisors, since the exercise of having to make any such reports will of itself change, and distort, the internal auditing function.

The external auditors may also report on the adequacy of the control procedures, and of (potential) failures in their implementation, though their legal and professional obligations differ from country to country and sometimes between financial institutions, (e.g. between banks and non-banks), even in the same country. They report primarily and initially to the company which they are auditing. The question, however, regularly arises whether, and when, and which external auditors should report to the supervisors/regulators, and what then should be so reported. This, however, is a large and sensitive subject, (as is also the legal responsibility, if any, of the auditors for failing to spot such control failures). This important question is a major issue in accounting (and law), but not one on

If internal management is party to the control failure (fraud?) or unaware of it (negligence?), it will usually be quite hard for external supervisors (or external auditors) to catch it. It is always easier to establish whether the appropriate procedures, rule books, and committees are in place, than to see whether the spirit of the procedures is being followed. If the supervisor develops suspicions, or has suspicious circumstances pointed out to her from elsewhere, there must be some mechanism for checking such suspicions. The commissioning by the supervisor of a special investigation by an external auditor, which may, or may not, be the institution's regular external auditor, would seem a possible response.

The obvious difficulties for external regulators, (or auditors) (of being able to catch control failures that internal management is either trying to cover up, or is simply unaware of), have not stopped much of the Press, or those creditors damaged by such failures, from blaming (or seeking to blame) the regulators (and auditors). Ex post facto, there will be claims that there was much (semi-public) knowledge of the problems involved. One of the questions will be whether the supervisors were warned, and, if so, what steps they took? Another question will be whether, if not specifically warned, should they have known?

The sanction on a supervisor, who is warned from outside of a possible (control) failure and then takes insufficient action to prevent a failure, is likely to be quite strong. Self-preservation is likely to encourage all such outside warnings and rumours to be investigated up to a point³, even if this may

³ Several more sceptical academic commentators doubt this. They tend to believe that "regulators have incentives to turn a blind eye, for various reasons (not all of them reflecting badly on them), and the principle concern for regulatory agencies is to cover themselves. Regulatory history, almost always leads to plausible deniability/excuses/cover-ups/playing for time, etc, not energetic intervention." Whether such suspicions are valid, or not, the lack of transparency on the work of the regulators fosters such criticisms.

encourage malicious tale-telling, (though this will be mitigated if the investigation is kept strictly secret).

Even though there should be incentives for supervisors to follow up warnings, or even market gossip, there will be limits on what they may be able to do if the subject, or target, of such warnings is uncooperative or obfuscatory. Everybody may have "known" that BCCI was crooked, but how can a supervisor close them without a 'smoking gun'. The right of supervisors to require that the regulated institution submit to a specially commissioned audit by an 'independent' auditor chosen by the regulator is potentially valuable in such circumstances. Since any announcement of such an action could impair confidence in the 'target' institution, the general public will, rightly, not be told of individual, specific occasions⁴; but it might be useful if a general report could be given, maybe after some delay, of the number of occasions when such a mechanism was used, and with what general results.

What is relatively easy for outsiders and supervisors to check are the formal mechanisms and processes. What is much more difficult to assess is human quality and culture. Moreover, since such quality and culture is intangible and unquantifiable, how can a supervisor impose a pecuniary penalty, e.g. a higher capital ratio, on a bank just because she does not trust the managers that she has met?

⁴ It may, however, be difficult to keep the appointment of such a special, extra, audit secret. Moreover an 'independent' external auditor may feel an incentive, under such circumstances, to chase every possible failing in the 'target' institution. Perhaps for these reasons, one national regulator told me that in his experience such special, extra, audits were almost unfailingly followed by the collapse of the 'target' institution.

⁵ This is an example of one of those rare cases where transparency may be counterproductive. If a bank can be publicly identified as having been subjected to a comparative penalty on largely subjective grounds by the supervisor, it would lose reputation, and might fight the issue in a law court. If the bank cannot be so identified, it might be more willing to accept the supervisor's demands. The Bank of England is said to differentiate between banks with respect to the capital

In this context it is far from clear how much direct knowledge of their supervisees we should expect supervisors to have, how they should obtain their knowledge, and how the skill and success (or otherwise) of their work can be assessed either internally, or just as important (though differently) transparently and publicly. How does one assess the optimum amount of supervision? How often and when should supervisors meet their supervisees (and at what level)?

This whole exercise imposes considerable costs on both the regulators and the regulated. Comments in the Press, following Barings' failure for example, sometimes implied that the Bank of England should have known more about Barings' business than its own management. Similarly, both regulators and regulated appear to expect the regulators to be able to pass judgement on technical risk control mechanisms, such as VAR models, when the private sector can afford to pay much higher salaries to experts in such specialised areas than the regulators can. It is hardly surprising that the regulated often claim to be teaching the regulators, rather than the reverse. The structure of resources and incentives often make that almost inevitable.

There is also to some extent an inbuilt negative and adverse bias in the public's assessment of supervisory skills. The failures have to become public knowledge; because of concern with reputation, supervisory successes in averting crises often have to remain secret, at least for a time. This is, perhaps, a bureaucrat's lament. The contrary view is that (most) bureaucracies are insufficiently accountable and seek ways to avoid taking responsibility. This underlines the question of how to reinforce transparency and accountability for the regulators, an issue made more complex in this instance by the innate confidentiality of their work.

ratios it requires; perhaps because such differentiation is not public knowledge, this practice has not, I believe, been legally challenged.

One possible approach is for the external supervisory authority to report on what it is trying to achieve, and on its successes and failures, to an independent person, or body, (on the analogy of the internal audit committee within a company), with again sufficient seniority and weight to force the regulator's CEO to respond to their concerns⁶. Again, analogously, such a report should not be made public at the time. Although eventual publication does raise questions of confidentiality, my own judgement is that such reports should be published after an appropriate lag. But does any such appropriate lag exist? Any early public report runs into behavioural and confidentiality difficulties, while a delayed publication misses the mark⁷. In an earlier draft, I had proposed a lag of 20 years; this was criticized with the comment that this "would have neither a disciplinary effect on the supervisor nor provide him with protection from the adverse and negative bias" previously mentioned. Is there any solution of this difficult problem?

In cases where the quality of the work of the authorities is important, but it is difficult to assess that quality, e.g. through the standard working of a market mechanism, one way of doing a quality assessment (e.g. in universities) is to survey the regulated (e.g. the students) for their 'anonymous' comments. There could be advantages in having regular surveys of the regulated institutions to find out how they view their regulators. It would be best if such surveys were carried out by an independent body, again perhaps the same as suggested previously. The survey findings, perhaps

⁶ This approach is roughly modelled on the Bank of England's Board of Banking Supervisors. It would be helpful to have some public discussion in the near future from the insiders of whether that model has been perceived as successful in practice.

There are no doubts problems. Just as the question arises of how detailed a knowledge of the regulated do you want your supervisors to have, so with a tendency towards infinite regress, how detailed a knowledge of the supervisors do you want an independent Board to have? Again, just as with the question of how do you expect to get skilled regulators when they are offered a diet of low pay and public criticism, how do you expect to get a skilled and independent Board (not subject to conflicts of interest)?

⁷ On the other hand, if there is enough political pressure, as there was with Barings, such an independent body may be forced to investigate and publish immediately.

after screening for malicious comment, could and should be published after processing. The extra information would no doubt be biased and of limited value (as in universities) but the costs should also be small, so the slight marginal benefit should exceed the marginal cost.

Whether a similar approach, i.e. surveys, could be used among other groups, e.g. investors of other kinds, to assess perceptions (e.g. of costs and benefits) of regulation is also worth considering.

3. Pay-off Structures

One of the main reasons why agents do not abide by established control procedures is because it is not in their own perceived interest to do so. In particular when the pay-off structure from their actions makes it in their own self-interest to assume risk, they will tend to do so whatever the rule-book may lay down.

If the pay-off structure, relating the reward to the agent to the success of the risky action being taken by that agent, has a curvature as shown in figure 1, agents will wish to assume greater risk, since the downside risk is less than the potential upside gain. Equivalently, if the curvature is reversed as in figure 2, agents will be induced to be risk averse.

It is, therefore, important for all concerned with risk-avoidance (internal or external) to be aware of circumstances where agents, who make decisions affecting the institution's assumption of risk, face a

Next, a bonus payment usually does not kick in until some minimum (good) outcome is reached, and often when it starts, often has a minimum lump-sum, as shown at point B in figure 3. Clearly in the area below B, the agent will be risk loving. Finally, bonus payments often are capped, to avoid presentationally embarrassing pay-outs (or which may disturb internalrelativities). As the agent nears the cap (or beyond it) she will become increasingly risk averse; alternatively agents may use various strategies for shifting accounting profits from one year to another. Outcomes generating risk-seeking behaviour are marked with ///, and risk-avoiding are marked \\\ in figure 3 below.

The influence of capital adequacy on risk-seeking behaviour is understood by most people, and the consequential rationale for external regulators to enforce (graduated) additional controls over financial institutions with insufficient capital is generally accepted. Theiso-morphism with the effect on risk-seeking behaviour of the pay structure is generally not well understood⁸, and there is little willingness or acceptance by internal management for allowing external regulators to have any say in the matter. Indeed, the internal committees and groups that examine risk, and its control, within firms virtually never consider internal pay structures. Equivalently, the (personnel) committees and groups within companies that decide on remuneration virtually never consider, or discuss, the implications of what they are doing for risk-seeking behaviour.

This is a sensitive area. Perhaps one possible approach would be to require the internal audit committee to sign on some form that they had reviewed the effect of their company's pay structure on the assumption of risk by key-decision making agents. That might at least make them ask

⁸ Particularly in the aftermath of Barings, there may now be increasing awareness of the effect of the pay structure in general, and of bonuses in particular, on risk-taking behaviour in agents. It is an issue that has exercised many bank boards and senior management. Some institutions are making more of their incentive payments on a deferred basis, and others are trying to apply some kind of risk-weighting to agents' profit streams. But there remain many obstacles to changes in customary habits in this respect.

questions internally, for example of whether and how traders⁹ who have made losses and may fear the sack are more closely supervised. But besides measures to try to make internal management more aware of this problem, it is doubtful whether the climate is right for any further intrusive measures by external regulators.

⁹ Much of the mis-selling of financial products in the UK in recent years may have been the result of inappropriate remuneration structures. The sales aspects of such incentives need to be considered as well as the effects on traders.

4. A Graduated Response

Besides limiting risk-seeking behaviour, gambling for redemption, the greater the capital the less the likelihood of insolvency for a given expected risk. For both reasons the less the remaining capital, the greater the danger. There cannot be a single point value above which the financial institution is safe, and below which it must be closed. Clearly danger increases gradually as capital diminishes. That fact by itself implies that there should be a graduated series of responses from the external authorities as capital diminishes. Beyond that, the fact that each, and every, dividing line, (say the 8% minimum level of the Basle Committee), is arbitrary, makes it undesirable to put too much weight on any one such number. It is preferable to have a series of such dividing lines, with the effect of going through any one of them relatively minor, but the cumulative effect large. In this respect the principle of the graduated sequence of responses in FDICIA seems right.

Regulators often argue that establishing a pre-stated sequence of such responses to worsening capital positions, involves the application of rules to regulators. In practice, they claim, they also apply a sequential and graduated response to capital impairment, but because their response is discretionary it can be tailored to each specific case (and all cases differ). There are several arguments that can be made on both sides, (e.g. if the response is to be graduated, the present 8% starting point is already probably too low). My own prejudice in this area is that there is a good general argument that precommitment and rules are normally advantageous. But if the external regulator feels very strongly about a particular case, it should be allowed to override the precommitment. That, however, leaves a problem. Both the justification for, and perhaps even the existence of, such an override in this matter may need to be kept confidential for obvious reasons. How then can one prevent the external regulator from effectively just exercising discretionary control? My own answer to that, once again, is that the report and justification would have to be made to the 'independent' overseeing body, again with full publication after an appropriate lag.

One reason why most economists have argued for a pre-committed ladder of responses in such instances is because the authorities' record of `forbearance' in several cases has proven expensive, (S & Ls in the USA, recent experiences in Japan). But economists also argue that it may be worth making a distinction between those circumstances where the erosion of capital arose because of the idiosyncratic behaviour of the institution's managers and where it came about because of a generally adverse market movement, see Dewatripont and Tirole, 1993, and Nagarajan and Sealey, `Forbearance, deposit insurance pricing and incentive compatible bank regulation', Journal of Banking and Finance 1995. The argument is straightforward. Where the loss has been caused by the manager's individual decision, she is, to some considerable extent, to blame, whether this loss arose from a lack of effort, lack of skill, or willingness to take on excessive risk. When the loss is caused by a general market movement, it is not really the manager's fault. Since one purpose of the system of capital adequacy requirements is to provide an incentive for good managerial behaviour, it makes sense to penalize a loss caused by managerial failings more severely than one not so caused.

A problem with that line of argument is that in circumstances when the market as a whole has been falling there is more likelihood of systemic failure, though that cuts both ways. A `credit crunch' initiated by a maintained application of unrelaxed capital adequacy requirements, following market declines, might well intensify the downturn. Also, a policy that relaxes prudential requirements in response to general `market' movements may reinforce the herding tendency. If a banker is to be penalized more for a loss made just in his own institution more severely than when every bank makes a similar loss, then herding will seem safer and more attractive. An external regulator should seek to encourage diversification in behaviour, and to check the tendency to herding, since that would be likely to worsen systemic risk.

In general, the adverse effect of idiosyncratic loss, as contrasted with a general condition of losses to

all members of the group, in terms of its effect on future reputation, income and employment of the individual agent is already more severe. It is questionable whether it would be desirable to load the scale further towards herding (and away from individual experimentation) by distinguishing in the regulatory framework between idiosyncratic and market losses. Moreover, the regulators would often find it hard to make any such distinction, or at least to give it a quantitative calibration.

Nevertheless, some exogenous shocks to the financial system can be so extreme, and/or unpredictable, that no sensible government would refrain from some form of direct assistance. The outbreak of war in August 1914 was one such case; the LDC crisis in 1982 was very likely a second; a major earthquake in a metropolitan centre would be a third. It would hardly be possible both to run an efficient financial system in normal times, and to ensure that financial intermediaries had sufficient capital and reserves to survive such extreme outlying events. Moreover, it is hardly possible to assess the statistical probability of such extreme outliers.

At the moment, the procedure for deciding on the extent of capital cover for extreme events seems arbitrary. A 3 times multiplier is to be applied to the capital estimated to be necessary under the VAR models to meet the specified normal parameters. An alternative approach might be for the external regulators to decide what were the limits in market movements beyond which they would be prepared to come to the assistance of their own financial institutions, e.g. over a specified period of time a fall in equity, or of property, prices more than x%, or a rise of interest rates more than y% could be regarded as the extreme limit for self-help. Then these values could be fed into stress tests, and the institutions required to hold sufficient capital to meet shocks up to such pre-designated limits. This is somewhat similar to the Lamfalussy requirement whereby markets have to have sufficient capital to survive the failure of the largest single (net) debtor.

If capital cover was to be related to specified extreme market movements, rather than to the standard

parameters in the VAR model (times an arbitrary multiplier), what would become of the VAR normal model? One idea that has been mooted is that institutions should precommit themselves to restricting losses within a given limit over some specified future time scale. Then if they make larger losses than the precommitment, there should be a sanction. As in similar circumstances elsewhere, a pecuniary sanction would not be advisable. This would further erode capital, just after an unexpected adverse shock.

What might be better instead would be to require an institution which had just experienced a larger absolute change in portfolio valuation (up or down) than precommitted, to have to aim for a smaller variance in asset values for the subsequent n months. Say, for example, that an institution precommits to limit changes in portfolio values to below plus/minus 3% in any fortnight, and fails; it would then have to precommit to, say, a tighter limit of plus/minus 2½% for the next, say, three months. Continuous failure to meet precommitment would force an institution towards an increasingly safe portfolio structure, whereas success in achieving its objectives would enable it to move out a step at a time towards a riskier portfolio structure, if so desired. Since volatility is itself auto-correlated, (as shown by the success of various ARCH models), there could be additional advantages in a system that led institutions to aim for less volatile portfolios after an initial shock (up or down) had caused them to exceed their prior committed variance level.

Conclusions

In the body of the paper a number of suggestions were made that might possibly improve the regulatory system. Some of them are speculative and contentious, whereas others are already generally accepted pious wishes. A listing of these suggestions/proposals is as follows:-

- (1) Ensure appropriate sanctions are applied to internal management which allows control failures to occur.
- (2) Require large financial institutions to establish an internal audit system, but which neednot report regularly to the authorities.
- (3) Establish an analogous internal audit committee for the supervisors themselves. The supervisors should report regularly to this Board, and those reports should eventually be published.
- (4) Survey the regulated, and perhaps investors, on their perceptions of the benefits and costs of financial regulation.
- (5) Require the internal audit committee of such financial institutions to signify that they have considered the implications for the risk preferences of key personnel of their pay structures.
- (6) Establish a pre-committed graduated series of responses in face of capital erosion. Such rules could be overridden by the authorities, but such an override would need to be specifically justified in the report to the independent audit body, and that report would eventually be published.

- (7) Do not try to distinguish in this graduated response between losses caused by idiosyncratic or general market developments.
- (8) Decide what market movements are so extreme as to merit government support to withstand them. Require capital to meet shocks up to this limit in stress tests of proprietary models.
- (9) Require institutions to precommit to preventing actual, ex post, variance in portfolio values greater than some chosen value over a set reference period. Failure to meet that target would then require the institution to adopt a lower variance objective over some subsequent period of time.