REMUNERATION AND RISK

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Many employees in the financial sector receive a significant part of their income in the form of profit-related bonuses. They therefore have a personal stake in the outcome of the activities they carry out on behalf of their employer. If these employees have significant discretion, then a firm's overall risk profile may be influenced by its employees' attitudes to risk.

This article draws on research undertaken in collaboration with Dr Margaret Bray (London School of Economics).The views are those of the author.

Every financial firm will or should have its own institutional policy on the appropriate balance between risk and return. In general, this will not match the preferences of all of its individual employees. Some will prefer more risk and more potential return, while others will be more risk averse than their employer. At the same time, employees and firms typically do not face the same trade-off between risk and return. Handling these differences is one of the major management challenges for financial firms.

There are two main ways in which the behaviour of employees can be influenced. This article focuses on the incentives created by the remuneration and compensation structures within a firm. Equally important, however, are direct management methods — for example, rules defining the discretion of employees to carry out particular actions. The two are clearly complementary. Effective controls on risk taking and measures to ensure the honesty of employees are essential, no matter how the bonus scheme is designed. But a remuneration scheme which gives perverse rewards to risk taking behaviour may put the control system under great stress.

Remuneration schemes

The issue of risk taking and remuneration arises in many different kinds of activity. For the sake of discussion, this article focuses on a specific common case; that of a securities trader or similar employee who is paid a large, variable bonus dependent on some measure of value generation. These employees tend to have significant discretion in the risks they take with a firm's capital and monitoring these employees is typically difficult.

Money is, of course, not the only form of reward. But for simplicity it is convenient to assume that it is, and that all that matters is the expected value of an employee's compensation package and its variability. Under this assumption, Charts 1 to 3 opposite show how agents' preferences in relation to risk and return help determine the actions they take.

The three charts show how different combinations of risk preferences and reward schedules can be used by a firm which has decided upon its risk appetite. Chart 1 shows the firm's trade-off between expected return and volatility of return, and shows how the securities market line (the rate at which risk is rewarded in the market) meets the firm's indifference curve (the curve along which the firm is prepared to trade off risk and return) at the preferred volatility V. The other two

charts show employees' trade-offs between expected compensation and volatility of compensation. Chart 2 shows how an employee whose indifference curve is flatter than the firm's (indicating that the employee is prepared to accept more risk for the same expected return) can be made to choose a level of risk corresponding to the firm's preferred level by giving him a reward schedule which gives poorer rewards to risks taken. Chart 3 shows the opposite case — a risk averse employee who is motivated to take risks by being rewarded more generously.

Risk preferences

The rate at which an employee is prepared to trade off risk against return is not necessarily an intrinsic characteristic of that employee. It can be influenced by a number of factors, many of which are under the control of a firm's management.

These factors can be grouped into two broad categories — the 'psychological' and the 'managerial'.

Amongst the psychological are such intangible influences as the goodwill of employees toward their company and the 'culture' of the firm. If these are strong, it will be easier to adjust individual preferences so that they are more compatible with the firm's. There can also be unfavourable psychological factors; the desire to be a 'star' or to conceal a poor judgement can lead agents to take excessive risks.

Chart 1: firm's risk appetite

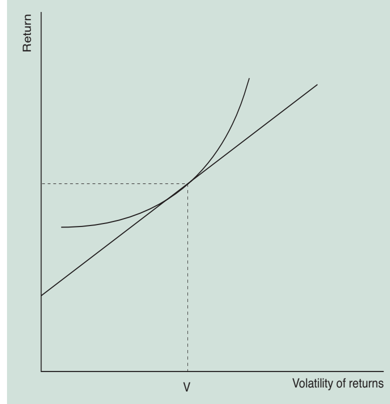


Chart 2: risk tolerant employee

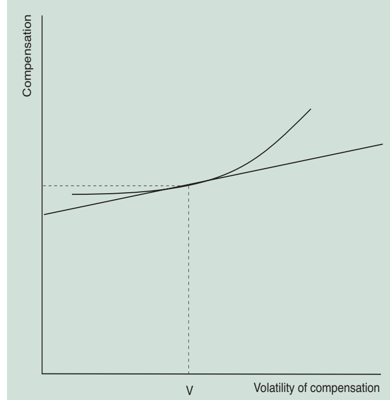
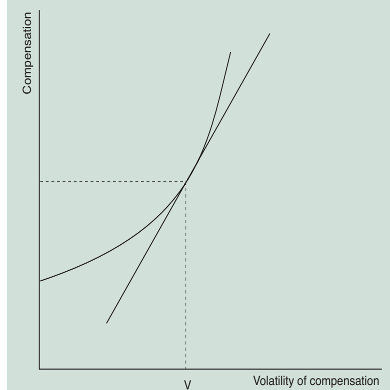


Chart 3: risk averse employee



Managerial factors relate to the way firms directly monitor and control their employees' activity. Examples are the daily marking to market of positions and position limits. If a firm has effective monitoring systems, and if it has a strong compliance policy which is rigorously enforced, then individuals will be less likely to regard an incremental trading risk (which might secure them a larger bonus, but might also get them sacked) as worth taking.

Rewarding risk

One insight into the way in which risk is rewarded is that only part of a compensation package is likely to affect risk taking behaviour — broadly, the part which is connected with the actions it is intended to influence. Thus a commission on trading profits will affect risk taking behaviour because its value almost entirely depends on the risks taken with the firm's capital.

Certain other common features of compensation systems may not feature in an employee's risk incentives. Guaranteed bonuses, for example, or bonuses which relate to a managerial assessment of potential, are not connected to the outcomes of risky actions and so should not affect risk taking. The absolute level of compensation should not have any incentive effects.

There are caveats. First, it is often the case that seemingly non-profit-related bonuses are in fact linked to profits. 'Guaranteed' bonuses may be linked to a profit target,

or a managerial opinion may in fact be based on revenue generation.

Second, there is the influence of psychological factors. Remuneration has a social role as well as an economic one; the highest bonuses usually go to 'stars', who may feel compelled to justify their status by taking greater risks in the hope of making higher and higher profits.

Limited liability

The simplified analysis of Charts 1 to 3 shows how employees' attitudes to risk are influenced by the rate at which it is rewarded. However, that analysis makes a simplifying assumption with an important effect on the conclusions, namely that the risks to employees' compensation are directly comparable with the risks faced by the firm. However, over the typical range of trading risks this is not the case. Employees' contracts almost always involve limited liability; they may share profits from favourable trading outcomes, but it is difficult or impossible to make them compensate their employer for losses.

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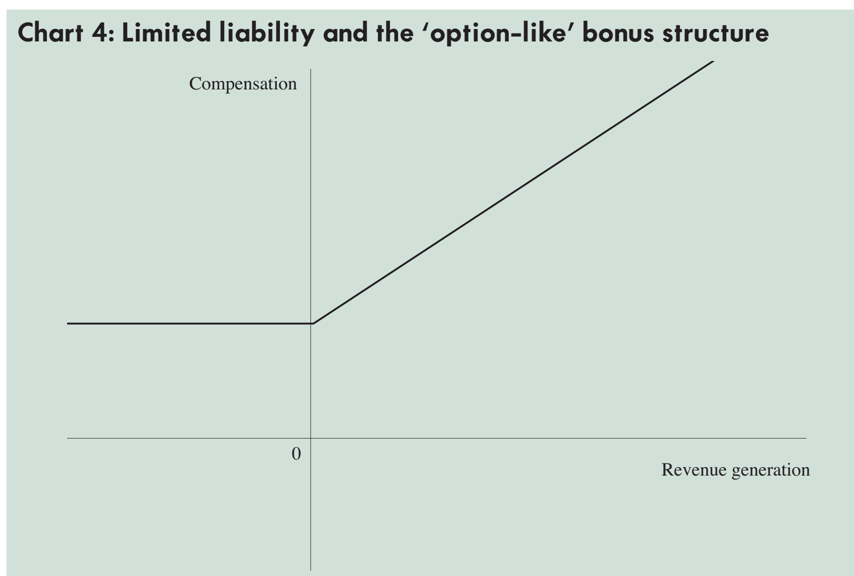
Chart 4: Limited liability and the 'option-like' bonus structure



The compensation structure illustrated in Chart 4 therefore has option-like characteristics — specifically those of a call option written on a trader's revenue generation. One property of a call option is that the parameter (vega) which relates its value to the volatility of the underlying asset is always positive. This means that the fair value of the compensation package is greater when the trader's revenue generation is volatile. If the value of a financial compensation package was all a trader cared about, the incentive would be to increase the revenue volatility as much as possible — ie he would take bigger risks.

In practice, compensation in one year is unlikely to be all that an employee cares about. But the problem of limited liability is always in the background. For example, if an employee knows that there is a seller's market for his own form of specialised labour, the cost of dismissal may seem to be lower (unless circumstances involve some significant reputational damage). Such an employee may be tempted to gamble on the prospect of a big bonus at one firm, with the prospect of employment at another if things go wrong. Creditors of limited companies have the Companies Act to protect them but financial institutions need to protect themselves from the limited liability of their employees.

There are features of compensation schemes which can mitigate the effects of limited liability. Some firms place a cap on the total compensation which they are prepa-

red to pay to any one individual. This can be a powerful weapon against perverse incentives. Such policies can be difficult to maintain, however, particularly when staff can extract the difference between their perceived worth and the salary cap by moving to another firm.

Another approach is the 'deferred bonus', under which bonuses are allocated for a trading period but not paid until some time later. In principle, this gives firms the opportunity to pay negative bonuses by removing money from the deferred bonus if performance deteriorates. This would give the employee's compensation a moving average link to a number of years' performance and mitigate the limited liability problem. Perhaps understandably, this approach has not proven popular with employees. Its main use currently appears to be as a kind of 'golden handcuff' to prevent employees from moving from firm to firm so easily.

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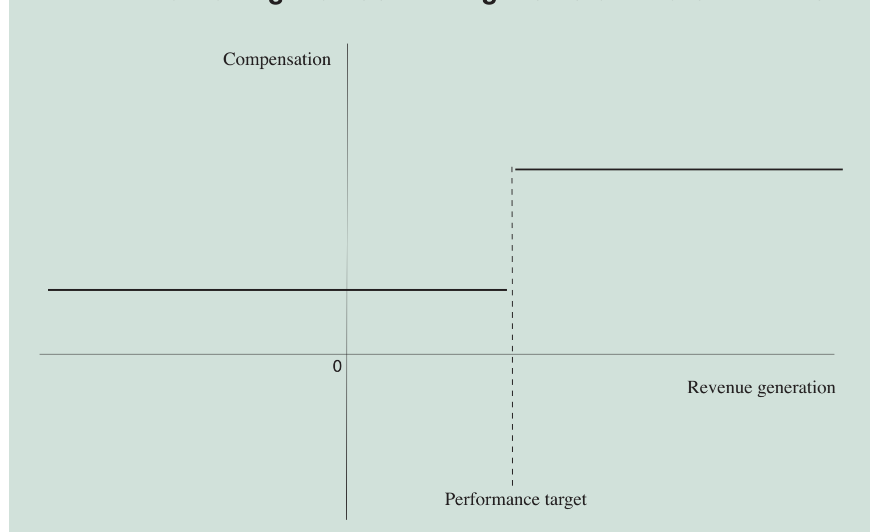
Discontinuities

In some cases, an employee will be faced with a situation in which a small change in value generation will result in a very large change in compensation, for example where the award of a large lump-sum bonus is conditional on the achievement of a profit target. An employee with such a compensation package would face a remuneration schedule like the one in Chart 5.

This is more akin to a binary option, a security which is often very difficult to price. Its sensitivity to the volatility of the underlying asset can be positive or negative, depending on whether it is in or out of the money. Again on the assumption that all that matters is financial compensation, an employee's incentives will reverse whenever accrued revenues move above or below the target.

Immediately below the target, the employee's main concern will be to earn a bonus. There will be a greater propensity to take risks, as the possible benefits outweigh the downside. Immediately above the target, the employee will be more concerned to keep the bonus which has been earned and which will not increase, so he will tend to avoid risk. This means that for traders who are near the borderline it will be difficult to be sure on any given day whether the problem of management is to spur them on or to rein them in. This uncertainty complicates the monitoring effort.

Chart 5: "All or nothing" bonus structure gives discontinuous incentives



This problem can be alleviated by introducing some ambiguity into the payment of bonuses. If an employee who has only just missed a target may nevertheless get a bonus, and if an employee who has only just made a target may not get one, then the shift in incentives will be less sharp. Furthermore, if employees understand that factors other than revenue generation will be used to determine compensation, employees who are at the borderline will be easier to manage. Linking rewards to a good compliance record may be one possible approach.

Dismissal policy

One case in which a number of perverse incentive effects can come together is when an employee's record is such that he fears he may be dismissed. In this case, there is a limited liability effect, because, except in the case of dishonest or criminal behaviour, dismissal is the worst sanction an employer can inflict.

There are also discontinuity effects, as a large success will move the employee out of the dismissal zone. An employee in this situation may have little to lose and everything to gain by taking large gambles with the firm's capital. It is possible that psychological factors may make the employee reluctant to accept failure.

This is a difficult problem for management. Clearly, a firm cannot go on employing loss-making employees forever. But a culture in which it is regarded as acceptable to lose money once in a while (something which is almost inevitable if markets are efficient) may mitigate pressures to take excessive risks. Once employees are identified as underperformers, more effort can be expended to monitor their risk taking and restrict the amount of capital they can put at risk.

Psychological factors can make employees reluctant to accept failure

Measuring performance

All the remuneration schemes discussed so far have involved the simplest possible measure of value generation — essentially gross trading revenues. While the limited liability and discontinuity effects discussed do not depend on the precise measure, their impact can be modified by the use of more sophisticated performance measures which allow the risks taken to enter directly into the assessment of a trader's performance.

There are a number of ways in which this adjustment to trading revenues can be made. The two most common seem to be to use the standard deviation of trading returns as a proxy for risks taken, and to impute a charge for usage of the firm's capital in supporting risky positions and subtract that charge from trading revenue. The main benefit of using either adjustment is that it ensures that risk is brought into the equation. However, implementation of advanced performance measurement methods does require a firm to have sophisticated management information systems.

Remuneration policy

Apart from its direct effects, remuneration policy also has a broader role as a management tool. The amount someone is paid provides powerful signals to other employees about what is regarded as desirable behaviour. If large bonuses are paid to employees who make money but are perceived to have a cavalier approach to compliance, it is likely to encourage similar behaviour in others. This may particularly be an issue for firms which try too hard to retain their most profitable employees.

Remuneration policy has an important part to play in a firm's overall management of risk. It can contribute to, or make more difficult, the reconciliation of the firm's own risk/return trade-off with those of its employees. As such it is of increasing interest and concern to supervisors and regulators.