**Discussion Paper on**
**Funding and Premium Assessment for a**
**Deposit Insurance Scheme**

## Introduction

On 24 April 2001, having considered the results of a consultation exercise on the subject, the Executive Council approved in principle the establishment of a deposit insurance scheme ("DIS") in Hong Kong and asked the HKMA to consider the detailed design features of such a scheme.

2. The purpose of this paper is to discuss, and to seek the views on, the following issues:-

(a) the adoption of an ex ante funding approach;

(b) the appropriate size of the DIS fund ("target fund size") and the manner in which it should be built up and maintained; and

(c) the appropriate level of the premium and the possible introduction of a differential premium system based on the supervisory ratings of banks.

3. Because of the complexity of these issues, firm proposals are not presented for consultation at this stage. However, detailed suggestions for how they might be dealt with are set out in this discussion paper. Comments on the paper are requested by 15 October 2001. After receipt of these comments, a set of rules on funding and premium assessment, and on other aspects of the DIS, will be circulated for formal consultation with the industry and other interested parties.

4. It should be noted that this paper does not address the issue of how the administrative costs of the DIS would be funded.

## An ex ante funding approach

5. Funding for deposit insurance can take the form of either building a reserve or a fund on an ex ante basis or having the power to raise funds when needed on an ex post basis. The drawback of an ex post funding approach is that the whole cost would have to be met by the member banks after a failure, at a time when banks may be least able to bear the cost. Moreover, the bank that failed would not have paid for the cost of protection. Having an upfront fund would allow premiums to be collected in good times at rates that are

within a pre-defined range. It would also enable banks to better estimate future funding requirements. This would be preferable to levying on an ad hoc basis under an ex post system without knowing, in advance, the magnitude of the premium. The results of the earlier public consultation also showed that an ex ante funding approach was generally favoured by the banking industry. However, even an ex ante approach needs a mechanism to replenish the fund should it be depleted by losses.

**The target fund size**

6. Although it is recommended that an ex ante funding approach should be adopted, it is not the intention to establish a large DIS fund. The fund is not there to meet *all* conceivable funding requirements. Otherwise the fund size and therefore the DIS cost would be prohibitively and unnecessarily high. The back-up funding, which is essentially a liquidity facility to enable the DIS to make prompt reimbursement of depositors' claims, would be provided by the Exchange Fund. The funding provided by the Exchange Fund would represent a loan which would be repaid by the DIS and would carry a market-related rate of interest. The DIS fund should therefore aim to cover losses which might be suffered by the DIS, not its liquidity requirements. Such losses mainly come from two sources: possible shortfall losses and financing costs associated with the payout to depositors.

7. Shortfall losses refer to the losses suffered as a result of payout to insured depositors in excess of funds recovered from the liquidation of a failed bank[1]. Financing costs arise from the need to pay interest on the borrowing the DIS has undertaken to finance the payout to depositors.

8. The loss suffered by the DIS would vary each year depending on the frequency of bank failure. Hopefully in most years there will be no loss at all because there is no bank failure. However, in bad years there might be one or more failures. Conceptually, the DIS fund should not only be able to deal with **expected losses**, i.e. the average losses to the fund, it should also have a **volatility reserve** to absorb **unexpected losses**.

9. Expected loss is intrinsically a long-term (through the cycle) concept, representing the average loss of the fund in a given period (say, one year). It can be calculated by aggregating the expected loss attributable to each individual bank. At the individual bank level, expected loss can be calculated as the product of three factors:

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[1] It is assumed for the purposes of this paper that the failed bank is liquidated. This is not to rule out the possibility of other means of resolution, including takeover by new owners.

Expected Loss = Default Probability x Insured Deposits x Loss Given Default[2]

10. The volatility reserve is to cater for the risk that the loss in any one year might be much greater than the expected level. A larger volatility reserve reduces the likelihood that the fund may become insolvent. This is a factor that contributes to the credibility of the fund. It is akin to the capital required by a bank to absorb losses.

11. The determination of the appropriate fund size basically involves deciding to what extent the DIS fund should be able to absorb unexpected losses in addition to expected losses. A statistical model has been used to assist in this process.

**The simulation model and the related assumptions**

12. The Consultant which undertook the consultancy study on enhancing deposit protection in Hong Kong developed a model for that purpose based on Monte Carlo simulation. This allows DIS costs to be estimated based on assumptions about the default probability of individual banks, shortfall loss and funding costs. Numerous iterations of the model are run to produce a statistical distribution of possible losses. From this can be calculated the annual expected loss of the DIS and the annual maximum loss up to a given confidence interval. For the purposes of this paper, a fresh set of calculations has been made, using assumptions that differ in some respects from those used by the Consultant.

13. A key assumption continues to be that the DIS would obtain an assignment of the preferential claims of the depositors to whom it had paid out. This assumption is crucial in estimating the DIS's losses arising from a bank liquidation.

14. The model assumes a discrete failure event i.e. in any iteration a bank will either fail or not fail according to a default probability attached to each bank. The default probabilities have been derived from the average annual default rates associated with the credit ratings of one of the major credit rating agencies. Unrated banks have been assigned ratings by the HKMA based on their peer groups.[3]

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[2] Loss given default is expressed as a percentage of insured deposits and comprises both shortfall loss and financing costs.

[3] This is different from the approach adopted by the Consultant which assumed more broad-brush probabilities of default, based on two scenarios (see pages 43-44 of the Consultant's report dated 31 July 2000). The current approach of the HKMA allows for greater differentiation among individual banks. It means, for example, that a BBB- rated bank would have an expected default rate for the year ahead of around 0.3%, which would imply that it would be expected to fail in 30 out of 10,000 iterations of the model.

15. The recovery rate in the liquidation of a failed bank is assumed to be 50%[4]. Under this assumption, shortfall losses will occur only if the payout in respect of insured deposits exceeds 50% of the assets of the failed bank. The assumption of 50% asset recovery tends towards the conservative side given the generally good asset quality of banks in Hong Kong and particularly if the DIS secures the preferential claim status of the depositors to whom it has paid out (see paragraph 13).

16. The annual funding cost of the DIS arising from the liquidity back-up facility is assumed to be 8% per annum. According to insolvency practitioners, it is reasonable to expect that the DIS would be able to recover the payout to depositors (and repay its borrowing) within approximately 7.5 months. This means that the actual financing cost to be borne by the DIS would equate to about 5% per annum (i.e. 8% x 7.5/12).

17. A total of 10,000 iterations has been run to ensure there is a convergence of results. Convergence means that running additional simulations will not give a result that is significantly different to what has already appeared in the past iterations. In other words the statistical distribution using 10,000 iterations should represent fairly the possible outcomes given the input parameters and assumptions.

18. The simulation does not incorporate a default correlation i.e. a statistical measurement that caters for the circumstances where failure of one bank might precipitate the failure of others. This is because :-

(a) a DIS is designed to prevent unwarranted contagion due to loss of confidence; and

(b) if such multiple failures were to be caused by external events, the scenario is probably a systemic one which the DIS is not designed to deal with.

19. Even though default correlation was not incorporated into the model, it was observed that multiple failures did occur in the simulation results. The results therefore incorporate the impact of a number of banks failing independently at the same time.

20. Overall, the assumptions used in the simulation exercise are considered to be conservative.

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[4] The Consultant assumed a triangular frequency distribution for asset recovery rates of 10%, 50% and 70%. To simplify the assumptions, we have opted to use only the middle of the range (i.e. 50%).

21. Applying the above mentioned model, the annual losses for the DIS at different confidence intervals are set out in **Table 1** below. The mean value represents the annual expected loss of the fund.

**Table 1**

| | Mean Value | 95% Confidence Interval | 99.8% Confidence Interval |
|---|---|---|---|
| Required premium (Basis Points of Insured Deposits) | 0.98 | 7.1 | 26.8 |
| DIS Cost (HK$'000) | 53,303 | 384,325 | 1,500,000 |

22. The above figures are lower than those originally estimated by the Consultant reflecting the different (but still conservative) assumptions used for the current exercise. For the purposes of setting the target fund size, this would enable us to go for a higher confidence interval than that suggested by the Consultant – 99.8% instead of 95%. Another way of putting it is that with a fund that covered up to 99.8% of possible losses, the probability of the DIS becoming insolvent in the year ahead would be only 0.2%. This would be consistent with an investment grade rating for the DIS[5].

23. As a cross-check on the credibility of a fund of HK$1,500 million, it should be noted that this would be sufficient to cope with the simultaneous failure of two of the larger medium-size banks[6] in Hong Kong (or a larger number of small banks). This is based on the actual insured deposits of the banks and on the assumptions about funding costs of the DIS and asset recovery rate.

**Achievement and maintenance of target fund size - the static approach**

24. In this section, we will present our suggestions on the build-up and maintenance of the target fund size. For simplicity, we have assumed initially a static banking environment, i.e. there is no deposit growth, the risk

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[5] As noted, the fund size has been estimated on the basis of a one-year time horizon. A longer time horizon would be more conservative, but would also require additional "capital" to be built by the DIS in advance to cover potential losses over a time horizon longer than one year. However, this seems unnecessary, given the proposed ability of the DIS to levy surcharges and the fact that, as a non-commercial organisation, it can afford to build up its capital over time if it is depleted by losses.

[6] This is a suggested IMF benchmark for assessing fund size. The amount required to fund the payment would, of course, be much larger than HK$1,500 million, but this would be met from the liquidity back-up facility.

profile of banks remains unchanged, and the financing cost of the DIS is fixed at 5% per annum. Some of these assumptions will be relaxed in later sections.

25. The results in **Table 1** suggest that to achieve a fund size of HK$1,500 million, an aggregate premium of 26.8 basis points (bp) of insured deposits would be required. This could be built up over time. If an annual premium of 8bp is charged at the build-up stage, the target fund size could be achieved in three to four years. A difficult issue that needs to be addressed is what should happen once the fund has reached the target level. Unlimited accumulation of funds might entail an unnecessary strain on the resources of the banks.

26. One possible method would be to adopt a hard target approach whereby any surplus is rebated to the banks when the fund rises above target and any shortfall is replenished by a surcharge in addition to the premium when the fund is below target. This would result in high volatility and low predictability of the level of premium. It would place a potentially heavier burden on banks during a poor economic environment. In an extreme case, it could compound the risk of default of weaker banks.

27. An alternative approach would be to introduce a target range containing a soft target at its centre with corresponding upper and lower limits. If the fund exceeded the upper and lower limits, rebates and surcharges would be used to bring the fund back towards the target gradually. This would be less procyclical and would enable the fund to build up an additional buffer which would cushion the impact on the banks if the DIS were to be subsequently hit by losses.

28. The FDIC presently operates a system similar to the hard target approach. Under this approach, if the fund size is in excess of the statutory reserve ratio of 1.25% of total insured deposits, the FDIC is not allowed to levy a premium on well-capitalized and highly-rated institutions. As a result, 92% of insured institutions in the US are not required to pay for deposit insurance at present. On the other hand, the FDIC is obliged to raise the premium to bring the reserve ratio back to the target of 1.25% if it falls below this level. The premium charged must be at least 23bp (unless the FDIC believes that a lower premium could enable the target reserve ratio to be achieved within one year) until the reserve ratio meets the target[7]. In the recent review of the FDIC scheme in the US, it was considered that such an approach could create a moral hazard problem in good times (because insurance is provided free) and the potential for volatile premiums in bad times.

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[7] If the reserve ratio is not brought back to 1.25% within one year, the FDIC must establish a schedule for returning the reserve ratio to 1.25% within 15 years. Rates under the schedule cannot be lower than 23bp, but could be higher.

29. The soft target approach would mitigate these problems. Applying this concept to the DIS fund the initial soft target could be set at HK$1,500 million as previously discussed. An appropriate target range could then be defined by setting a reasonable buffer, say, 30%[8] above and below the soft target. In monetary terms, the initial target range for the DIS fund would be from HK$1,050 million (the lower limit) to HK$1,950 million (the upper limit). The upper and lower limits of the target range would then become the trigger levels at which rebates and surcharges would kick in to maintain the DIS fund within the defined target range.

**Funding requirements after target fund size has been achieved**

30. Before considering how the system of rebates and surcharges would work, we will need to consider the funding requirements after the target fund size of HK$1,500 million has been achieved. In particular, we will need to decide whether banks would need to continue to make premium payments, and if so, at what level.

31. The theory behind a fund size of HK$1,500 million is that it would provide the DIS with enough "capital" to absorb **unexpected** losses. However, even after the target has been reached, the DIS should conceptually continue to set aside a sufficient "provision" each year to meet its **expected** losses[9] (i.e. the average loss expected in any given year). The provision required to cover expected losses would be much lower than that required to build up the capital of the fund (see Table 1 above). In absolute terms, at the current level of insured deposits it would amount to about HK$53 million per annum (an annual charge of about 1bp)[10].

**The rebate and surcharge mechanism**

32. However, even charging an annual premium based on expected loss only might result in the DIS fund continuing to grow without bounds if there were to be no payouts. While this would provide a bigger cushion to

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[8] This compares with the buffer of 8% above and below the statutory reserve ratio of 1.25% proposed by the FDIC. However the target reserve ratio of the FDIC is approximately 4 times larger than the proposed DIS fund of approximately 0.3%. Seen in this perspective the 30% buffer would not be unreasonable.

[9] Maintaining ongoing premium would also mitigate free rider problems associated with new member institutions joining or existing institutions growing their deposit base significantly subsequent to the initial fund build-up phase and therefore benefiting from "free" insurance.

[10] To the extent that the expected loss actually materialises in any given year, this would be offset by the premium. If the expected loss does not materialise in a particular year, this would help to build up an additional contingency buffer of provisions which would enable above-average losses in succeeding years to be absorbed without eating into the DIS's "capital". The concept is similar to that of "dynamic provisioning" for expected loss adopted by some banks.

meet any substantial losses that might eventually materialise, it could also impose unnecessary cost on the banks.

33. In its current review, the FDIC has tried to address this problem by introducing a system of rebates and surcharges. This could also be adopted in Hong Kong. The basic approach is illustrated in Table 2 below and in Annex A.

34. Table 2 makes a number of simplified assumptions which can be used to illustrate how the control on the growth of the fund would work.

35. The main assumptions used in Table 2 are as follows:

(i) there are no bank failures and the risk profile of the banks and the amount of insured deposits remain unchanged throughout the period covered. This means that the target fund size remains at HK$1,500 million throughout, as do the upper and lower limits of HK$1,950 million and HK$1,050 million (i.e. HK$1,500 million ±30%).

(ii) the premium is initially set at 8bp to allow the fund to build up to the target level of HK$1,500 million. This produces premium income of HK$435 million in each of the first three years[11]. The premium is levied at the beginning of each year based on the amount of insured deposits at the beginning of that year (which remains unchanged in this case).

(iii) the fund also benefits from investment income which is estimated at 6%[12] of the balance of the fund outstanding at the end of the previous year.

(iv) once the target fund size of HK$1,500 million is reached, the annual premium drops to HK$53 million representing the annual expected loss of the DIS.

(v) once the upper limit of HK$1,950 million is exceeded, rebates are paid to the banks (which in the example in Table 2 exceed the annual premium). For the purposes of the example, the rebate has been set at 30% of the difference between the target fund size (i.e. HK$1,500

[11] i.e. 8bp (0.08%) of HK$544 billion of insured deposits. The amount of insured deposits has been estimated as at May 2001.

[12] Investment income at 6% per annum corresponds to the average annual rate of return achieved by the Exchange Fund prior to the Asian Financial Crisis (1993 to 1996).

million) and the fund balance at the end of the previous year. In year 12, therefore, the rebate of HK$175 million equals 30% of HK$582 million (HK$2,082 million minus HK$1,500 million).

**Table 2**

| | Use of rebates after target fund size is reached | | | |
|---|---|---|---|---|
| **Year** | **Premium** | **Investment Income** | **Rebate** | **Fund (HK$'m)** |
| 1 | 435 | 0 | 0 | 435 |
| 2 | 435 | 26 | 0 | 896 |
| 3 | 435 | 54 | 0 | 1,385 |
| 4 | 115 | 83 | 0 | 1,583 |
| 5 | 53 | 95 | 0 | 1,731 |
| 6 | 53 | 104 | 0 | 1,888 |
| 7 | 53 | 113 | 0 | 2,054 |
| 8 | 53 | 123 | (166) | 2,064 |
| 9 | 53 | 124 | (169) | 2,072 |
| 10 | 53 | 124 | (172) | 2,077 |
| 11 | 53 | 125 | (173) | 2,082 |
| 12 | 53 | 125 | (175) | 2,085 |

36. As can be seen from Table 2, the annual rebates prevent the fund size from accelerating away from the upper limit of HK$1,950 million, but do not bring it within that limit. Some fine-tuning of the size of the percentage rebate might therefore be required.

**The impact of losses**

37. As noted earlier, the size of the fund could also be affected by losses. If we relax the "no-loss" scenario assumed in Table 2, it would be necessary to have a mechanism to levy surcharges should the fund fall below the lower limit of HK$1,050 million.

38. The surcharge (and rebate) mechanism is illustrated in Annex A under different loss scenarios. Under the high-loss scenario the fund would be severely depleted and would actually be negative in year 5 and year 12 (i.e. the DIS would be insolvent). In this situation, in addition to the annual premium (set at the expected loss level after the initial build up), a surcharge would be

levied at a rate of 30% of the difference between the closing balance of the fund (positive or negative) at the end of the previous year and the target fund size. Thus, in year 6 of the high-loss scenario in Annex A, the surcharge of HK$606.88 million is equal to 30% of HK$2,022.93 million (difference between negative balance of HK$522.93 million and HK$1,500 million).

39. Once the fund rose back above the lower limit of HK$1,050 million, the surcharge would cease to be levied (as in year 10 of the high-loss scenario in Annex A).

40. In Annex A, the surcharge would, along with the regular premium, raise the total annual contribution of the banks to as much as 12.6bp (in year 13). While this does not seem unduly burdensome compared with the minimum of 23bp that would presently be charged by the FDIC to replenish its fund, consideration should be given to whether a cap should be placed on the total annual contributions that the banks could be asked to pay. One approach (illustrated in Annex A) would be to place the cap at 8bp, the same as in the initial build-up of the fund. However, this would protract the process of building the fund back up to the target range and could impair public confidence in the DIS.

**The apportionment of rebates and surcharges**

41. It would also be necessary to set rules as to how rebates and surcharges should be apportioned among individual banks. In the case of surcharges, the amount levied on an individual bank would be assessed in the same way as premiums, i.e. in relation to the current risk that the bank in question poses to the DIS. This would be determined by the current level of insured deposits and, possibly, the risk rating of the bank.

42. This method may however be less appropriate for rebates since the current level of insured deposits is not necessarily a good guide to the contribution that an individual bank has made to building up the fund. Indeed, there would be a risk that banks could try to grow their deposits at a more rapid pace in order to get a larger rebate.

43. It would seem more appropriate therefore to share rebates among banks in proportion to their past contribution to the fund. **Table 3** below illustrates the approach assuming that the fund size is currently HK$2,100 million. This would imply a rebate of HK$180 million (being 30% of HK$600 million).

**Table 3**

| Bank | Net past contributions HK$m (premium less rebates) | Percentage of total (%) | Rebates HK$m |
|---|---|---|---|
| A | 1,000 | 47.6 | 85.7 |
| B | 600 | 28.6 | 51.5 |
| C | 400 | 19.0 | 34.2 |
| D | 100 | 4.8 | 8.6 |
| Total | 2,100 | 100 | 180 |

44. A further issue that will arise when the DIS has been up and running for a number of years is how far back we should go in aggregating past contributions to the fund. In the case of the FDIC, it is proposing that there should be a limit on the length of the "look-back" period of say ten years (i.e. only premium paid during that period would count towards determining share of rebates). This would enable relative newcomers to catch up quicker with more established members of the DIS in terms of share of rebates.

**The need to cater for deposit growth**

45. So far it has been assumed that the target fund size remains static at HK$1,500 million. In practice, it would be necessary to take account of balance sheet growth, particularly growth in insured deposits. Another variable is changes in the risk profile (i.e. credit ratings) of the insured banks. This means that we need to hit a moving, rather than a static, target.

46. The impact of deposit growth is shown in Annex B under various loss scenarios. The required fund size at the beginning of each year has been determined on the basis of the amount of insured deposits at the beginning of that year. Using a model of the kind described in paragraphs 12 to 23 above, the target fund size has been set, in absolute terms, at a level corresponding to a predetermined confidence interval designed to give the fund investment grade status.[13]

47. The same assumptions about default probabilities, initial premium (i.e. 8bp) and investment return are made as in the static analysis. Deposit growth and asset growth per annum are assumed to be 9% and 5% respectively, based on the actual growth rates since 1997[14].

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[13] As previously described, for the purposes of Table 1 above, a 99.8% confidence interval was assumed.

[14] Asset growth is relevant since it helps to determine the amount of assets recovered in a liquidation.

48. Under the no-loss scenario in Annex B, the target fund size rises to HK$2,047 million in year 4. At that point, the closing balance in the fund exceeds the target and the premium can be reduced to the expected loss level. Unlike the static model, the premium continues to increase thereafter in line with deposit growth. No rebates are paid during the 15-year period of the example because the fund size never exceeds the upper limit of the target range. This need not be regarded as a drawback however since rebates should only be paid if the fund is clearly much larger than it needs to be. It is a matter for debate as to whether the 30% margin for the upper limit of the target range is reasonable or not. The incidence of rebates would also, of course, depend upon actual deposit growth.

49. Under the high-loss scenario, the effect of assumed losses in years 4 and 5 means that the target is not reached until year 10. During this period, the premium is set at 8bp throughout because the capital element in the fund is still being built up.[15] Thereafter it drops to the expected loss level. However, subsequent further losses in year 11 and 12 would again require surcharges to be levied. The surcharge (plus regular premium) would amount to about 12.3bp unless capped in the manner described in paragraph 40.

50. In principle, the methodology used to derive the figures for target fund size could be used on an ongoing basis by the DIS to derive the target fund size for the year ahead. In practice, however, it may be simpler to set the target level in terms of a fixed percentage of insured deposits. Annex B shows that the "target reserve ratio"[16] remains at about 0.30% during the period covered. On this basis, it would be possible to express the target range as a percentage, e.g. 0.21% to 0.39% (0.3% ±30%). The percentage would be applied to the level of insured deposits in order to arrive at the required size of the fund in HK$ terms. However, if this approach were to be used, the percentage would need to be reviewed at regular intervals to ensure that it was still appropriate for the amount of risk borne by the DIS. Higher funding costs and downgrades in the credit ratings of insured banks would require a larger fund as a percentage of insured deposits (see below).

**The impact of other variables**

51. While the assumptions in Annex B are reasonably realistic, it is possible to conduct further sensitivity analysis to show the effects of:

(i) higher deposit growth, at say 11% per annum throughout the period;

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[15] We have assumed that surcharge would not be levied in addition to premium during the initial period when the capital of the fund is being built up.

[16] The target reserve ratio measures the target fund size as a percentage of insured deposits.

(ii) higher funding costs for the DIS back-up facility (7.5% instead of 5%), which would increase potential DIS losses in the event of having to make a payout; and

(iii) a deterioration in the risk profile of Hong Kong incorporated banks (signified by a downgrading of their credit ratings by one notch), which would increase the required size of the fund.

52. The impact of higher deposit growth is shown in Annex C. A larger fund is required in absolute terms, though the target reserve ratio remains at around 0.30% except in year 15[17]. In the no-loss scenario, the target size would be reached in year 4, as in the base case scenario in Annex B. Subsequently, however, growth in the fund would find it difficult to keep up with growth in deposits, and the closing balance of the fund would remain persistently below target. Finally, in year 15 the balance in the fund would drop below the lower limit of the target range, and a surcharge would be necessary. The situation would obviously be exacerbated in high-loss scenario. In this case, higher surcharges would be required in absolute terms than in the lower deposit growth scenario in Annex B, e.g. surcharge (plus annual premium) of HK$2,266.23 million in year 13, though this would be a slightly lower proportion of insured deposits (11.9bp) because of the higher growth in such deposits.

53. The implications of higher funding costs are illustrated in Annex D. This assumes that the annual cost of borrowing rises to 12% (compared with 8% in the base scenario). If we continue to assume that the DIS would be able to repay its borrowing under the back-up facility in 7.5 months time, this would result in an annual financing cost of 7.5% of the amount paid out to depositors (i.e. 12% x 7.5/12). Higher financing costs feed into higher expected losses for the DIS and push up the target fund size and, in this case, the target reserve ratio (to about 0.43%). The effect in the no-loss scenario is to delay achievement of the target size until year 6. In the high-loss scenario, the cost of bank failures would rise significantly and the fund would never reach its target size. In fact, it would be negative throughout most of the period. This would raise the question of whether a premium higher than 8bp would need to be levied. Annex D demonstrates the importance of the financing cost assumption and of the vital importance of a speedy payout to the DIS in the event of liquidation.

54. Finally, Annex E shows the impact of a simultaneous downgrading (by one notch) of the credit ratings of all Hong Kong incorporated banks and the maintenance of the lower ratings throughout the 15-

[17] The reason for the increase in the target reserve ratio in year 15 is that the faster growth in deposits relative to assets eventually increases the risk of shortfall loss (i.e. that the recovery rate in a liquidation will be insufficient to enable the DIS to recover what it has paid out).

year period. This would give rise to higher default probabilities and thus require a larger fund and higher target reserve ratio (around 0.40%) to meet expected and unexpected losses. Under the no-loss scenario, achievement of the target fund size is again postponed to year 6. However, the balance of the fund remains around target throughout and no surcharge is necessary. In the high-loss scenario, the target fund size is never reached and the premium remains at 8bp throughout the 15-year period (therefore no surcharges are levied). Again, this would raise the question of the sufficiency of an 8bp premium.

55. The conclusion of the analysis seem to be that it would be reasonable to aim for a smaller starting fund (i.e. HK$1,500 million) and a lower premium (8bp) than that originally envisaged in the Consultant's report.[18] These figures are based on reasonably conservative assumptions. As the base scenario in Annex B shows, in the absence of large-scale losses, it would be possible to reduce the premium to a much lower level representing the expected loss (say, around 1bp) after four years. The target fund size should have a reasonable capacity to absorb even relatively high losses although these might require surcharges to be levied. The need for surcharges would, however, be more acute if high losses coincided with prolonged rapid deposit growth, higher than anticipated funding costs or deterioration in the risk profile of banks in Hong Kong. In such an environment, the size of the regular premium might also need to be reassessed.

**Should there be a flat rate or a differential premium?**

56. So far the analysis has been based on a flat premium of 8bp. This is in line with the recommendation of the Consultant, which was embodied in the HKMA's Consultation Paper of October 2000, that initially at least we should opt for a flat, rather than a risk-based premium. This reflected the practical difficulty of risk pricing. During the consultation exercise, however, a number of respondents, including those in favour of a DIS argued that a risk-based premium was preferable on grounds of fairness and avoidance of moral hazard. When the results of the consultation exercise were presented to the Executive Council, it agreed that the question of risk-based premium should be looked at again.

57. The draft final report of the Financial Stability Forum on Deposit Insurance notes the advantages of risk-adjusted premiums but acknowledges that such a system can be complicated and difficult to administer.

58. The problem with a flat premium is that it does not reflect the level of risk that an individual bank poses to the DIS. This risk arises from a combination of the level of the insured deposits held by each bank and the

[18] Based on the Consultant's report, and without taking account of deposit growth, the fund size was originally estimated at around HK$2-3 billion and a premium of 10bp was indicated.

probability of its default. It is, however, difficult to measure precisely differences in risk and to align them with differences in the premiums that should be paid. Moreover, to the extent that differences in risk were to fully reflect in premiums, those paid by the weaker banks might further impair their financial soundness.

59. This has led us to consider whether it would be possible to introduce a relatively simple system of varying premiums which might more accurately be described as "differential" rather than "risk-based". The objective would be to differentiate between the riskiness of banks in a manner that was fairly broad-brush, but which would nevertheless award the better performers with lower premiums and give an incentive to the others to improve.

60. The question is what indicator should be used to differentiate between banks. One option would be to use a number of objective factors (e.g. capital adequacy, volume of non-performing loans, return on assets, volatility of income etc) to measure relative riskiness, perhaps in combination with a more subjective element in the form of supervisory ratings. The structure of risk-based premiums recently introduced by the CDIC relies on such a combination of objective and subjective factors in the form of a "score-card".

61. At the other extreme, it might be possible to base the differential system solely on supervisory ratings, in particular the CAMEL rating system[19] used by the HKMA and many other regulators around the world. This would be less complicated than explicit use of objective factors and would avoid the need to try to establish a precise correlation between these factors and the riskiness of different institutions. In any case, the objective factors that would be relevant are to a large extent already taken into account in arriving at CAMEL ratings, though in a rather judgmental manner.

62. Use of CAMEL ratings for premium setting purposes would be consistent with the current approach used by the FDIC, except that it also takes account of capital adequacy as a separate element in a two-dimensional matrix.

63. The CAMEL rating system might be a reasonable starting point, perhaps to be replaced with a more sophisticated approach in the light of experience. Under such a system, the premium paid by individual banks would be related to their composite CAMEL rating ("1" being best and "5" worst).

64. The current breakdown of banks by CAMEL ratings in each category is shown in **Table 4** below:

[19] CAMEL stands for Capital, Asset quality, Management, Earnings and Liquidity.

**Table 4**

| | CAMEL | | | | Total |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 & 5 | |
| Number of banks | 6 | 131 | 14 | 0 | 151 |
| % number of banks | 4.0% | 86.7% | 9.3% | 0 | 100 |

65. This shows that the largest number of banks is in the "2" category. One possible approach would be to apply the "standard" premium of, say, 8bp to banks in category 2. Banks with a "1" rating would enjoy a discount to the standard rate while banks rated "3" or below would pay a higher premium.

66. We would need to consider how wide the range of premiums should be. To the extent that banks with a significant proportion of insured deposits are in the "1" category, too low a premium for that category would make it more difficult to raise sufficient revenue to meet the target fund size. Too high a premium for the banks rated "3" or worse could put them under undue financial strain.

67. Bearing these considerations in mind, a possible premium structure might be as follows:

**Table 5**

| CAMEL | Premium in basis points |
|---|---|
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 & 5 | 14 |

68. Although the gap between the categories would be relatively small, it should provide a reasonable incentive for banks to improve their performance. By comparison, the current CDIC premium structure has 4 categories of 4, 8, 16 and 33 basis points[20]. Once our system had bedded down, it might be possible to move to wider increments coupled with more objective indicators of differences in risk.

[20] In practice, approximately 90% of Canadian banks are in the top two categories and pay a premium of 4-8 bp.

69. The premium structure in Table 5 would produce a weighted average premium that would probably be lower than the standard premium of 8bp[21]. If, for example, we assume a weighted average premium of 7bp, this would reduce the initial premium income (based on the assumed starting level of insured deposits) from HK$435 million to HK$381 million. This might imply that the standard premium should be raised from 8bp (and the other premiums adjusted accordingly). The other alternative would be simply to accept that it would take longer to build up to the target fund size. Annex F shows the impact of a weighted average premium of 7bp in the build-up phase. In this case, under the no-loss scenario, it would take one year longer to reach the target fund size. Under the high-loss scenario (assuming losses in year 4 and 5), the target fund size would never be reached and the premium would remain at 7bp throughout.

70. When and if the build-up phase was over and the fund had reached its target, the premium would, as previously explained, drop to the expected loss level. The overall required premium of about 1 basis point might be apportioned among the different categories of bank as follows.

**Table 6**

| CAMEL | Premium during build-up phase (bp) | Premium after build-up phase (bp) |
|---|---|---|
| 1 | 5 | 0.75 |
| 2 | 8 | 1.0 |
| 3 | 11 | 1.5 |
| 4 & 5 | 14 | 2.0 |

71. The main objection to the use of the CAMEL system is that it relies on the subjective judgement of the HKMA. Having said that, the system has been in use for some time and the composite CAMEL rating is disclosed[22] to AIs on a regular basis without serious disagreements so far. It is recognised however that use of the CAMEL system for premium setting purposes would attach even greater importance to the rating process. The HKMA is already reviewing its internal guidelines to staff on the CAMEL system, including to incorporate the risk management rating which is derived from its risk-based examinations. If the decision is taken to adopt the CAMEL system for

[21] This would depend on the distribution of insured deposits among the CAMEL rating categories.

[22] It would be important that the CAMEL ratings assigned to individual banks remain confidential. Provisions would need to be introduced in the relevant legislation to ensure that the CAMEL ratings and premiums charged do not become public information. Similar provisions are included in the CDIC Act.

premium setting purposes, the intention would be to publish an explanatory memorandum on how the system works and the factors that the HKMA takes into account in setting the ratings.

**How the target fund size and the premium would be set in practice**

72. To recap, the estimates of target fund size and premium set out in this paper have been derived by means of the following steps:

(i) making assumptions about possible shortfall loss and funding costs of the fund, and the probability of default of insured banks;

(ii) feeding these assumptions into a statistical model in order to calculate the target size of the DIS fund and the level of annual premium required to build up the fund to the target level within a reasonable period of time. The target level of the fund would be designed to cover both expected and unexpected losses up to a given confidence interval. Upper and lower limits of the fund would also be set to produce a target range;

(iii) recalculating the target level of the fund each year to take account of deposit growth, changes in the risk profile of insured banks and the funding costs of the DIS;

(iv) once the target level of the fund had been reached, basing the annual premium on the expected loss of the DIS;

(v) paying a rebate or levying a surcharge, when the balance of the fund rose above or fell below the upper or lower limits of the target range; and

(vi) possibly differentiating the premium paid by individual banks, based on their supervisory ratings.

73. In theory, once the DIS had been set up, it could employ a similar approach to setting the target fund size and the premium on an annual basis. However, this would raise the question of how this process should be prescribed in the DIS legislation and what discretion the DIS should have to change the specifications and assumptions of the model used to derive the estimates of fund size and premium.

74. This suggests that it may be simpler and give more certainty to the insured institutions to specify the target fund size and the structure of the premium in the legislation itself at the outset. This could be done, as suggested in paragraph 50, by expressing the target fund size as a percentage (say, 0.30%) of insured deposits and a target range of ±30% of the target. Rebates and surcharges would be paid or levied when the fund stayed outside this range

(subject to a cap on the size of the surcharge that could be levied in any one year).

75. The legislation would also specify the premium structure that would be levied in the build-up period (as in Table 5 above). The premiums to be levied after the build-up phase would also be specified (as in Table 6).

76. The actual figures to be set out in the legislation would need to be based on the circumstances prevailing at that time (e.g. as regards the risk profile of insured institutions). **The figures quoted in this paper should therefore be regarded as only indicative at this stage**. Possibly the legislation should provide scope for the premium, both in the build-up phase, and thereafter, to be set within a fairly narrow range to give some discretion to the DIS to take account of changing market circumstances. However, even with this, there would have to be scope for the target fund size and premium to be subject to regular review by the DIS to ensure that they remained relevant. If changes were required, this might be done, after consultation with the industry, by secondary legislation, subject to the approval of the Chief Executive in Council and the vetting of Legislative Council.

**Invitation to comment**

77. Comments are invited on the approach set out in this paper and on the indicative figures for the target fund size and annual premium. Comments should be submitted to the Hong Kong Monetary Authority before 15 October 2001 in the following ways:

(i) By post addressed to the Banking Development Department, 30/F, 3 Garden Road, Central, Hong Kong; or

(ii) By e-mail addressed to dis@hkma.gov.hk

**Banking Development Department**
**September 2001**