Hints for Solution

Problem 1

The background material for this problem is to be found in Freixas and Rochet chapter 9 (pp.281-282, possibly supporten by Note 11 from the hompage). The discussion may take as its point of departure the model by Repullo, in which there is both verifiable information in the form of the withdrawal from the bank made by costumers and non-verifiable information about the business of the bank. In this situation the central bank and the deposit insurance institution will have different incentives to support the bank, and it is preferable to make an agreement on who has to decide which depends on the size of the withdrawal.

In the formulation of the problem there is asked for an inclusion in the model of possible takeovers by other banks, where the willingness of the latter should be decisive for whether they will support the bank in this way.

If only one part has access to relevant information about the business of the bank, the simple model must be modified, since for example if the central bank is the only one having the information, it will be able to transfer all risk to the deposit insurance or to the private banking sector. If the private banks have monopoly on information, one should expect speculative behavior, preventing the others from supporting a bank which is solvent, since potential buyers will then get the assets of the bank at a lower price.

Problem 2

The sketched situation can be described using the simple model for Poisson distributed defaults as described in Freixas and Rochet chapter 8 (pp.222-224). We are dealing with loans which are either repaid according to agreement or fully lost. It can be shown that in this situation its correct to assess expected net present value by discounting at an interest rate equal to the interbank rate plus a "spread", the size of which corresponds to the intensity parameter in the underlying Poisson distribution.

When credit risk is assessed through VaR, one finds first the loss distribution for each loan and then the loss distribution for the whole portfolio. What is mentioned in the problem formulation points to correlation of these distributions, which in practice means that it is insufficient to measure VaR for each loan separately using a "country risk" for each country and neglecting the correlation.

Problem 3

The background literature is the lecture note on payment cards (Note 8, pp.7-11). In the Tirole-Rochet model for payment cards and their use, which should be briefly outlined, one derives a condition for the welfare optimality of the system: the benefit of the marginal card user and the merchant should correspond to the resource cost of card transactions. The situation sketched in the problem suggests that the merchant fee is rather too high, and it is also to be expected, that not very many users stop using card if their fee will be raised somewhat. The solution is therefore to change the interchange fee between the issuer and the acquirer.