Andreas Krause

Theoretical Foundations of Commercial Banking

Problems with indicative answers

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Preface

This booklet accompanies the textbook 'Theoretical Foundations of Commercial Banking' and provides indicative answers to the problem sets provided therein. For each problem, I have provided a suggested answer of how I intend it to be addressed. In many cases there will be alternative approaches to provide an answer, or additional aspects from the same or different models can be used. It is for this very reason that the answers provided here are merely indicative, not comprehensive, and certainly not conclusive.

The way the indicative answers have been constructed is based on intuition rather than a close examination of the models and their specific results. This has been done on the one hand to encourage a deeper understanding of the results from models, rather than a focus on the narrow confines of the model itself. On the other hand, the problem sets itself are constructed such that specific information to use the detailed results of the models is not possible in most cases. The reason is again to encourage an engagement with the essence of these models and their key results rather than the detailed outcomes, which are based on specific modelling assumptions and give rise to formulae that are only valid in these specific circumstances.

Each problem requires either a single model to provide an answer or the combination of a number of models, in most cases two models, although in some instances a wider picture is required, encompassing more models. For each problem I have provided an indicative answer as well as the models that are to be applied in this answer, identified by the chapter number in the main text. At the beginning of the booklet I have provided a model key which comprises a list of all the problems that can be solved using each model, once more identified by the chapter in the main text and indicated whether for a problem only this model is required (simple problems) or knowledge of additional models is needed (compound problems).

Andreas Krause
Bath, October 2025

Model key

The below key indicates the problems that can be solved with each of the models presented, as identified by their chapter number, from the main text. As indicated, there are two types of problems, simple and compound problems. Simple problems can be solved using a single model only, while for compound problems, multiple models are required for a complete answer, this might be two or more models. In some instances it might be possible to provide a partial answer using only a single model or a selection of the models that are required. Therefore, this key allows to identify those problems that can be solved when having studied only selected models.

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	Ch. 3.3	17, 18	19, 20
	Ch. 4.1	22, 23	19, 24, 27, 28
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	Ch. 4.2.2	30, 31	29
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	Model	Simple problems	Compound problems
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	Ch. 11.1.4	120, 121	
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	Model	Simple problems	Compound problems
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	Ch. 18.3	202, 203	204
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	Ch. 19.1.2	208, 209, 210	211
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	Ch. 19.1.5	217, 218	219
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	Ch. 19.2.2	222, 223	224, 225
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	Ch. 19.3.2	228, 229	232, 240
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Problem sets for Part I

Problem 1

During a meeting of the Chamber of Commerce in Porteven, a city that acts as a commercial centre for a mainly rural area, a discussion arises on the relevance and importance of banks. While this discussion is not pursued during the formal meeting, it gets picked up again by a group of business representatives at the drinks reception following the formal part of the meeting. Herbert Blømsted, owning a plumbing business with six employees, remarks that banks are essential for him. Without banks, so he argues, he would not have been able to set up his business in the first place or expand it to have even the small number of employees he currently has. The loans they provided were essential in allowing him to purchase the required stock of goods and, especially, the vans he needs for each of his employees. Arguing against him, Matthias Vliem remarks that he is not denying that banks are useful and of course he has used them many times during the last 30 years in which he has developed houses in the rural areas around Porteven. However, so he expands, they are just a convenience rather than an integral part of the economy.

How would Matthias Vliem argue his case?

Indicative answer: *The argument Matthias Vliem can put forward is that banks merely act as a 'pass-through' of the funds from depositors to borrowers. They play no active role as the money ultimately is obtained from depositors, who could lend the money directly to borrowers (firms in this instance), and thereby circumvent banks. In this scenario banks are nothing more than a 'market place' in which depositors (lenders) and firms (borrowers) are brought together and thereby reduce transaction costs that might otherwise emerge from the difficulty of matching lenders and borrowers. It is in today's world that any reduction of transaction costs by banks would be very minimal as online matching platforms would provide a simple and low-cost alternative to provide loans to companies directly.*
Model(s) used: Ch. 2.1

Problem 2

Argaguay is struggling to develop its economy and a large number of politicians across the political spectrum believe that this is due to the country having a very poorly developed banking system with only few banks that make barely any profits; it is therefore that they propose to develop the banking system further. Many economists, on the other hand, point out that there is no lack of funding for investments as they have a very efficient informal market for loans where the general public directly lends to companies seeking funds. They explain that it is the efficiency of this market that makes banks unnecessary and their existence a marginal phenomenon in the economy.

Would the development of the banking system in Argaguay affect the ability of companies to obtain loans?

Indicative answer: *The informal credit market in Argaguay is very efficient, which implies that loan rates are competitive and hence banks will have to compete with this market. Unless bank are able to offer additional benefits, they will have to compete with the direct loans that are currently given and not make a difference to the provision of loans overall. While more loans might be given by banks, this would not affect the investments of companies as competition would ensure the loan rates remain at a competitive level. There is thus no added value by having more banks operating in the economy.*
Model(s) used: Ch. 2.1

Problem 3

The developing country of Ranonda has experienced a period of economic crisis due to collapsing prices for many rare earth metals, whose export account for most of the economic activity in the country. Responding to the economic crisis, the government of Ranonda has allowed a foreign bank to operate with the aim of promoting investments into other sectors of the economy that thus far have been neglected, as they have no functioning banking system thus far. The success of allowing the foreign bank to operate is seen critically by many observers. It has been suggested that investment is much lower than it was prior to the economic crisis, despite now having a bank facilitating the provision of loans, even after adjusting for various macroeconomic factors. The fingers are pointed at the foreign bank, who is said to make excessive profits from its monopolistic position and charges higher loan rates than is normally justified while paying very low deposit rates, extracting profits from the economy in Ranonda. It has been suggested that returning some of the profits to their customers will increase investments as more funds are retained in Ranonda.

Would returning some of the profits to their customers positively affect the investments that are made?

Indicative answer: *The critical problem is that the bank has market power and therefore is able to generate profits by charging higher loan rates, which will reduce investment as the marginal product of investments need to be higher in this case. Having to return some of the profits will not change the loan rate the bank will charge as it will still seek to maximize its profits. It might have a small offsetting effect to return some of the profits in that more funds will be available in Ranonda that can be used for investment, but this is unlikely to off set the effect of the reduction in investments due to the higher loan rate.*
Model(s) used: Ch. 2.2

Problem 4

Gonçalo Pereira is the head of the Competition Commission and responsible for assessing the banking sector, having been promoted to this role based on his experience and contribution to the supervision of the food retail market. After only a few days in his new position he announces a major review of the banking sector and has explicitly invited representatives of peer-to-peer lending organisations to contribute to the review. He justifies this move by stating that they act as direct competitors to banks by facilitating loans directly between borrowers and lenders. Having interacted with Gonçalo Pereira during the review, representatives of the banking sector are not surprised to find that the interim report of the review states that banks are yielding too much market power, making the market inefficient, leaving loan demand below optimal levels, and that peer-to-peer lending should be encouraged for the loan market to become more efficient.

How does Gonçalo Pereira justify these initial recommendations?

Indicative answer: *We see that Gonçalo Pereira subscribes to the view that banks are acting as pure intermediaries. It is that the market power of banks increases loan rates and decreases deposit rates to generate profits; this has the consequence that the higher loan costs will reduce loan demand and hence investment. With peer-to-peer lending, the loan rate will be lower and the deposit rate, which is the same as the deposit rate, higher, making both parties better off and due to the lower loan rate, investment will be increasing.*
Model(s) used: Ch. 2.2

Problem 5

Paula Soveran is leading the treasury team at Polia Ltd., a large retail chain with stores across the country. Her duties encompass the management of any excess short-term funds the company has available and ensuring the company has access to adequate funds for its daily operation, but also for any investments the company needs to make.

Currently her main concern is the financing of another 10 stores to be opened within the next year, for which she needs to raise additional funds. An informal meeting with other senior managers of the company discusses the options available. Raising additional equity is quickly dismissed as not viable with the existing owners and so the discussion turns to the question of whether to go for additional bank loans as previously done without problems, or to issue bonds for the first time. The idea of issuing a bond quickly gets many supporters who point out that the banks have recently become more and more interfering in investment decisions. While banks cannot veto any decisions, they have on many occasions made clear that they would not support some decisions and that any future funding might be put at risk if a certain approach to grow their market share is taken. When issuing bonds, so the argument, this would not happen as there are no regular review meetings with bondholders, and hence they cannot interfere. Dissenting voices point out that the concerns of banks have never really limited the growth of the company, rather it was free advice. Further, they claim, banks often offer better conditions than the bond market, making bank loans cheaper, especially so as the bank market is currently very competitive. Paula Soveran emphasises that the economy is heading for a recession and the impact on the business is uncertain. While they offer a budget range of products that should do well in a recession, a large part of the profits are generated in the luxury end of the market and there the impact is more difficult to predict. It could be that in a recession this market shrinks due to customers cutting back expenditure, but on the other hand might well be willing to spend money on little luxuries which they offer. This uncertainty about the future returns on the investment they are making should be taken into account.

The further discussion quickly settles on one point they consider key: which one is cheaper, a bond or a bank loan?

Indicative answer: *If markets are competitive, as indicated by some members in the meeting, bank loans may well appear cheaper. If we assume that banks can extract more value from the company, this may take the form of being able to obtain a larger repayment in the case our strategy is not successful in the expected recession. Banks may be able to do so as they are monitoring a company and have therefore a much better idea on their ability to make payments, while bond holders will have to rely more on the information of the company. Hence, in any restructuring of the loans, the bank should be able to extract more surplus than bond holders. This additional surplus the bank can extract will be reflected in a lower loan rate offered by banks, compared to bonds. However, the additionally extracted surplus in case the company does not perform well imposes additional costs on Polia Ltd. and need to be weighed against the lower headline rate. If markets are overall perfectly competitive, then the total costs considering the interest paid and the additional surplus extracted by banks, would cancel each other out. Banks and bonds are equally expensive.*
Model(s) used: Ch. 2.3

Problem 6

In a discussion on the merits of a strong banking system during a meeting of a regional development agency, a banking representative points out the unique ability of banks to monitor borrowers better than the general public and thereby ensure funds available to companies are used effectively and recovered in case investments fail to deliver. A local company counters this by saying that banks hardly do this for free and companies are charged for this through higher loan rates, surely. In response, the banking representative says that the market is way too competitive to allow that and loan rates are lower than other forms of debt finance companies have access to.

Is this statement true?

Indicative answer: *Banks are competitive, but even though interest rates remain low, the higher recovery of monies from failed investments provides an additional income stream to banks. If banks are truly competitive, they would reduce the loan rate accordingly to take into consideration this higher recovery rate. Thus the lower loan rate, compared to other forms of debt, does not imply that bank loans are cheaper. With lower recoveries by other lenders, the companies would retain a larger fraction of monies from failed investments than with banks. These twi effects, in competitive markets, should offset each other, making a bank loan as expensive as other forms of finance.*
Model(s) used: Ch. 2.3

Problem 7

The government of Calanda seeks to develop a financial sector, particularly banks, to aid economic growth. Thus far the economy has relied either on loans provided directly by wealthy individuals or from banks abroad. The government claims that it is essential to develop a competitive banking system to avoid any inefficiencies and compete with the current provision of loans, which has worked effectively in the past. Critics say that this will have no effect on the economy as competitive banks will not influence investment decisions differently than with the current arrangements. Those in favour of developing the banking sector point to the fact that banks as specialist institutions will become better informed and that will allow banks to provide loans at lower loan rates. In the discussion between the government and its advisors it was also mentioned that a non-competitive banking system might give worse results than the current arrangements for loans.

Having been given contradictory advice that ranges from banks being beneficial to banks would make no difference to banks being detrimental, the government seeks advice from consultants on the benefits and costs of developing a banking system. What should the advice be?

Indicative answer: *A competitive banking system where banks make no profits will be neither detrimental nor beneficial the economy, assuming that the current ar-*

rangements to provide loans are competitive as well. In this case the banks are only handing through the loans from lenders to borrowers, not affecting the loan rates and hence the existence of banks makes no difference. Even if banks gain an informational advantage, this would not affect the outcome as banks would use their informational advantage to reduce the loan rate in some instances but increase costs to borrowers in other instances, which in a competitive banking system is balanced and does not affect the overall outcome. It is thus that even the expertise of banks would not be beneficial overall, assuming that there are no additional costs associated with this expertise. If the banking system is not competitive then the profits that banks extract from borrowers and depositors will be detrimental as the higher loan costs will reduce the investment. This will remain even if the profits of the bank are returned to borrowers. It is thus that the introduction of a banking system does not bring any advantages, but might be disadvantageous if the banking system is not competitive.

Model(s) used: Chs. 2.1, 2.2, 2.3

Problem 8

PLending Ltd. was founded 5 years ago to facilitate tailored peer-to-peer lending. They developed software that provides a platform for borrowers and lenders to negotiate the terms of the loan and is mainly used by high net-worth individual lenders and the borrowers are mainly mid-sized companies. These companies are mostly operating in well-established industries. The companies seeking loans are overall well-established themselves with ample public information about their business available and they typically show profitabilities that are slightly above average, all while using up-to-date technologies and ideas, but not being at the forefront of innovation. While the platform expanded quickly and gained a loyal following by borrowers as well as lenders, it’s growth has stalled in the last few months. At a strategy meeting of the Board of PLending Ltd. it is noted that the type of borrowers is rather limited to highly profitable and well-established companies in what many would describe as conventional industries. With many smaller, younger and very innovative industries struggling to secure the finance they need for developing and marketing new and innovative products and ideas, it was brought up that PLending Ltd. could seek to expand into this market segment.

As a member of the board, you argue that such a strategy would inevitably fail as you would unlikely break into this market segment. In your opinion small companies in such newly emerging industries would be either dominated by venture capitalists or banks specialising in such lending, but not peer-to-peer lending. How would you justify your stance?

Indicative answer: *The platform of PLending Ltd. reduces the costs of negotiation between borrowers and lenders and as such has found a niche in the market consisting of companies with specific characteristics. If we were seeking to attract smaller and*

more innovative companies, this would have two effects: firstly, given the smaller size of companies the transaction costs for each loan would increase, relative to the size of the loan. This would make the use of our platform less attractive as the costs are pretty not really varying much with the size of the loan. Therefore, we would lose our competitive edge relative to banks, where depositors face no transaction costs at all and those of borrowers will be much lower. Secondly, the transaction costs will actually increase as more innovative companies are often much more difficult to evaluate and the negotiations might prove to be more burdensome as the owners and managers are often much less professional in business dealings. On the other hand, the higher return these companies often generate, may make any negotiation costs slightly less important to them, which would work in our favour. Taken together, the higher transaction costs in dealing with the newly targeted companies, could well push us out of our niche in which peer-to-peer lending is sustainable and in competition with banks, we would gain only very limited new customers.
Model(s) used: Ch. 3.1

Problem 9

It has been observed that during a recent period of low interest rates that many individuals have used online platforms to provide loans directly to companies or individuals. While the loan rates were attractive compared to deposit rates in banks, some loans did default, imposing losses on the affected individuals. With the economy performing better and interest rates generally increasing, the financial regulator seeks opinions on making the provision of such loans illegal for all but professional investors, pointing out that the provision of such loans has virtually ceased anyway. This suggestion is supported by banks but opposed by companies having taken out such loans and also consumer associations. Companies argue that without being able to access direct loans, they will not only lose access to a form of low-cost finance, but loan rates themselves will increase. Similarly, consumer associations argue that deposit rates will decrease. Banks point out that as in the current economic climate direct loans are barely given, they will hardly make a difference.

Should the regulator outlaw loans to be provided directly to companies?

Indicative answer: *It has to be noted that even if direct loans are not observed, the possibility that loans might be provided directly will limit the market power of banks and require them to offer better loan conditions to companies and better deposit rates; the direct loans are on outside option for companies and depositors to obtain better conditions. If such direct loans are not possible, banks can take advantage of the lack of competition from direct loans and increase their profits. On that basis, direct loans should remain a possibility. In terms of the argument that direct loans are not anymore observed, this can be explained with the better economic conditions increasing the expected returns on investments and thus favouring bank loans with their lower cost of negotiating them. In this situation the bank has the potential to*

extract a larger share of the surplus from companies, causing the loan rate to rise; the threat of direct lending limit this ability of banks to raise loan rates. Thus, even if direct loans are not given, it is the possibility of using them that disciplines banks and it is for this reason that they should be retained.
Model(s) used: Ch. 3.1

Problem 10

Michael Matthews is a well known TV personality who regularly provides advice on financial matters during popular talkshows. He is well known for making rather unusual and often derided suggestions on how to save money on goods and services, but also occasionally suggests how to invest any savings people might have. A long-term issue he has is that in his view banks are paying too low deposit rates to their customers. Consequently, a common suggestion heard from him is to invest money in other schemes, be it shares, bonds, or most recently peer-to-peer lending. During one of his TV appearances, Michael Matthews explains that peer-to-peer lending works with a computer matching borrowers and lenders, splitting the total amount invested into smaller packets and allocating them to different borrowers. His argument now is that this way you get all the benefits of having invested into a different borrowers and receiving the interest they pay, less a small fee charged by the peer-to-peer platform. He contrasts this with banks that take a large part of the interest paid by borrowers and leave depositors with only low interest rates, while at the same time exposing them to the risk of all the borrowers of the bank, as their failure to repay can cause the bank to fail and then you would lose your entire deposit rather than only the small amount lent to the borrower that fails. So, his conclusion, you should deposit with banks only those amounts that you might need in the near future and any other savings should be invested elsewhere, including peer-to-peer lending.

How would you argue that banks do not expose depositors to larger risk than peer-to-peer lending and might well over superior terms than peer-to-peer lending?

Indicative answer: *As borrowers need to be monitored to ensure that investments the company makes are sufficiently profitable to ensure that the loan can be repaid, peer-to-peer lending would impose these costs on each lender for each loan they provide. Delegating the monitoring to a single lender would require a degree of coordination that is not feasible given the number of lenders and borrowers as well as their different sizes involved. Furthermore, this would lead to a moral hazard problem as a lender allocated to the borrowing will only have a small amount of his own money at risk, but facing the full cost of monitoring. Shirking the responsibility of monitoring is most likely to be widespread. Therefore, monitoring would have to be conducted by each lender individually, leading to a significant duplication of effort and thus significant costs. Banks, if providing the full loan amount would face these monitoring costs only once for each loan, leading to much lower aggregate monitoring costs. This, of course, has to be balanced against the risk of banks failing*

and the deposit not being repaid. As banks give a large number of loans, the failure rate of companies, while still stochastic, becomes a nearly known rate and if loan rates are sufficiently high, banks will be able to cover the losses from failing loans with the higher loan rate and will not fail. Hence, the depositors are not exposed to any risk. While banks might offer deposit rates that seem much lower than those offered in peer-to-peer lending, the loan rates need to take into account the risk of default of the companies as well as the monitoring costs of the bank. Even if the deposit rates was lower than the adjustment needed for this risk and the monitoring costs of the bank, it may still be more effective to use deposits over peer-to-peer lending. The reason is that depositors do not have to bear the monitoring costs themselves, which may make it more cost-effective to deposit the savings into a bank rather than invest into loans directly.
Model(s) used: Ch. 3.2.1

Problem 11

Carlos Segrado has inherited significant wealth from a recently deceased relative. In order to diversify his investments, he seeks to invest some of this wealth into loans. He plans to spread his loan investment across a larger number of individual loans in order to reduce the potential losses from defaults. In a conversation with his wife, he says that it is time consuming to provide such loans as he needs to assess the creditworthiness of each borrower. When his wife suggests that he could avoid the hassle and deposit the money with a bank instead, he says that this would not be a good alternative as the deposit rate is lower and the bank might fail and then he loses all the funds, which is highly unlikely with the large number of loans he has given.

Is his reasoning for avoiding bank deposits sound?

Indicative answer: *The argument that the return on deposits will be lower than the return on providing loans directly may well be true, but he has to take into account the costs of assessing the credit worthiness of the loans he provides. If banks are seeking to attract deposits from investors like him, the bank will ensure that deposit rates are set such that the return on deposits meet at least the return of direct loans net of any costs. It is therefore that Carlo Segrado's argument that the return on deposits is lower than on loans is not well founded. In term of the risk of the bank failing, he is also wrong in his assessment as the bank can make sure that it will not fail by setting deposits rates accordingly such that the funds available from bank loans are able to cover the commitment of the bank to depositors.*
Model(s) used: Ch. 3.2.1

Problem 12

Asle Børgvin has taken over the management of the CreditInvest fund which is managed on behalf of a group of institutional investors; it invests mainly into loans that have been securitised by banks and sold to them. The securitised loans are still administered by the originating bank and they also continue to monitor the companies to ensure compliance with agreements and provide advice to the companies that ensures the loans can be repaid. Going through the investments of the fund, Asle Børgvin is concerned to see that on large loans that have been granted jointly by multiple banks, each bank's effort to ensure the company complies with the loan terms seems to be rather minimal. This is in contrast to smaller loans provided by a single bank, where it seems that banks are much more diligent. In a meeting with banks to discuss the purchase of another set of securitised loans, Asle Børgvin mentions his concerns about their lack of effort in ensuring the quality of the loans is maintained.

How will banks response to these concerns?

Indicative answer: *The banks should point out that for large loans which are shared between that, each bank is monitoring, and therefore, while it might be that each bank individually seems to be not doing much to ensure the quality of the loan is maintained, the joined effort by all banks combined will be higher. It will actually be higher than what a single bank will do monitor their loans. It is therefore that larger loans given by multiple banks are actually better monitored than smaller loans given by a single bank only. It is therefore that Asle Børgvin's concerns are unfounded,*
Model(s) used: Ch. 3.2.2

Problem 13

Laleh Amiri has been appointed as the loan officer for a portfolio of borrowers in the health sector. Some companies are exclusively provided with loans by Karimi Bank, Laleh Amiri's employer, while other companies obtain loans from different banks, often in cooperation with each other. Her main task is to maintain contact with the senior management of companies and monitor their business activities to safeguard the repayment of the loans for Karimi Bank. Laleh Amiri's effort in keeping informed and providing advice to companies is widely recognised, but her manager raises concern about the amount of time she spends with some customers. In a casual meeting he tells Laleh Amiri that the time she spends with companies where loans are shared with other banks is too high and she might want to focus more closely on other companies with smaller loans that exclusively bank with Karimi Bank. Laleh Amiri defends herself by mentioning that the loans which are shared with other banks are larger than others, even if only considering the share of the loan provided by Karimi Bank; in order to reduce potential losses to Karimi Bank she spends more time on these loans.

Why does Laleh Amiri's manager suggest she spend less time on monitoring these larger loans?

Indicative answer: *The larger loans here are provided jointly by several banks and hence will be monitored by several banks. Thus the monitoring effort for these loans by all banks combined will be higher than for loans given only by Karimi Bank, even if Laleh Amiri exerts lower monitoring effort. The optimal level of monitoring that Laleh Amiri engages in needs to take into account the effort of other loan officers at other banks and by exerting the same effort as for individual loans, the effort is suboptimally high and it is for this reason that she is advised to rebalance her efforts.*
Model(s) used: Ch. 3.2.2

Problem 14

ContactSoft Ltd. is a company that develops and distributes online games to a small following of game enthusiasts that use elements of 'Steam Punk' in games to raise awareness for environmental concerns. Their games have so far mostly been app-based and required the player to complete tasks of increasing levels of difficulty. Their latest idea is to enter the market for 'multiplayer online role-playing games' allowing the players to directly interact with each other and take different roles within the game. This step was taken in response to feedback by players for a more interactive game experience. The specific positioning of the games they developed so far has attracted a loyal but rather small following in a specific sub-culture. The thinking of the owners is that by opening the game up to a more interactive platform that allows players more freedom in their game, it will attract a wider audience. As enthusiasts, they have thus far relied on start-up funding from the foundation of the company three years ago and have re-invested most of the profits back into developing their games by employing programmers for specific tasks as freelancers. The development of an online platform, however, by far exceeds to resources the company has. As not to relinquish control over their company and as a result of their resentment of large parts of the 'establishment', they decided against seeking funding from venture capitalists, but instead started a fundraising campaign amongst their most enthusiastic players. They found that many of their players were rather wealthy and thought to be able to raise finance in form of loans from them, promising an interest rate of 6% above the current rates for government bonds, in addition to early access to the new game for their backers. The take-up of this offer was, however, very limited and the monies raised fell far short of what is needed. At a games congress, they have been made aware of a bank that has previously provided loans to a number of games developers and the owners of ContactSoft Ltd. are discussing whether to approach this bank.

Does ContactSoft Ltd. has a higher chance of success with the bank than it had with their previous attempt of raising funds directly?

Indicative answer: *The development of games can easily be seen as a very nontransparent process, as many creative activities. The desire of developers for perfection, pursuing their own ideals, overly ambitious revisions, or a reluctance to give up unworkable ideas all may make the development much more lengthy, costly, and may even lead to a product that is not accepted in the market. All this aspects are very difficult to monitor for any outside and giving a small part of the funding will not allow the lender significant access to control and monitor the development process. A bank with the requisite experience in the business, however, may be able to monitor progress and direct the company to remain on a path to commercial success. While direct lenders, without an effective way of monitoring, have to rely on the business sense of the company to not stray too far from the rather safe commercial path and into the sphere of idealism, the bank's monitoring would force the company to prioritise the commercial aspects. When seeking direct lending from their followers, Contact Soft Ltd. was in most cases assessed as not creditworthy by their potential backers due to too weak incentives for prioritising the commercial aspects. It might well be that with a focus on commercial aspects the risks are sufficiently small for a bank to provide the loan. Therefore, approaching the bank would be advisable as long as there is a good commercial basis for their development.*
Model(s) used: Ch. 3.2.3

Problem 15

The market for semi-conductors has seen a recent increase in competition despite an increase in over all demand. The expansion of manufacturers who traditionally only supplied their in-house electronics departments with semi-conductor components have reacted to a squeeze in profits margins there by offering their components openly in the market. Given the size of these new entrants, many of the smaller manufacturers are have come under pressure. This also applies to SemiPro Ltd. who seeks to react to its shrinking margins and loss of customers by modernising its manufacturing technology and upgrading their products to the latest standard. An alternative suggestion by the development team to press ahead with a radically new design of semi-conductors that would give them a competitive advantage in many areas, has been dismissed by board for the time being as the technology around it has not been shown to be sufficiently reliable. Having to make substantial investments, they have approached the two main banks they have used for years to obtain a loan. With a unblemished record of repaying any previous loans they had sought, the Chief Financial Officer (CFO) of SemiPro Ltd. was surprised to see both banks first dragging their feet on a decision to approve the requested loan, only, when pressed for a definite answer, to reject their application for a loan of the size requested. Both banks were only willing to provide them with much smaller loans than are needed for the planned investments, making the modernisation and upgrades unfeasible. The CFO's assistant, Carl Lepper, has recently joined SemiPro Ltd. from a market leader in semi-conductor manufacturing and, in response the refusal of the loans needed, suggests to consider a bond offer instead. His experience with his previous employer suggests that the bond market is very receptive to bond issues from this industry.

Do you think a bond issue would be successful?

Indicative answer: *The rejection of the loan application by the banks suggests that banks have assessed SemiPro Ltd. to be too risky to grant a loan. The reason for this would be the reduced margins and increased competition the company currently faces and given that the loan would be used to catch up with competitors is unlikely to give them a substantial advantage in the market place. This suggests a low return on investment of the company, limiting the loan rate, combined with substantial risks if the performance deteriorates further. Given the situation of the company it is reasonable to surmise that they might well switch to the strategy of introducing newly designed semi-conductors. This strategy, given the state of the technology, would be very risky. Thus there is a potential moral hazard problem for any lender. The banks can, through monitoring, ensure this strategy is not chosen against their will, but nevertheless reject the loan, deeming even the proposed strategy as too risky. The offer of a small loan, which the bank surely knows would not be sufficient for the needs of the company, can be seen as an offer they know will be rejected by the company, but is made to maintain the banking relationship. When issuing a loan, any monitoring of SemiPro Ltd. will not be as well conducted as thoroughly as a bank would be able to and thus the moral hazard problem is likely to aggravate the risks to the lender. It is therefore unlikely that a bond issue would be successful, unless potential bondholder assess the risks of SemiPro Ltd. very differently. The comparison to a competitor that can raise funds in the bond market, neglects the difefrent position the two companies are in. As a market leader the profit margins should well be higher and the risks more limited, given the large market share. This would result in lenders assessing the risks as sufficiently small and also the moral hazard to be limited as a market leader typically already employs the best available technology. In conclusion, a bond issue is unlikely to be successful.*
Model(s) used: Ch. 3.2.3

Problem 16

Yuki Hanada manages a hedge fund specialising in credit risk and is considering investments based on securitised bank loans and bonds issued directly to investors. In assessing the risks of each potential investment, she is surprised to find that bank loans are generally riskier than bonds. This seems to be the case despite banks monitoring the companies they provide loans to, which is supposed to reduce the risks of loans compared to bonds, where monitoring of companies by bondholders is usually absent. When assessing the quality of monitoring by banks, she found that larger loans that are provided jointly by several banks are less monitored by each bank than loans originated by a single bank, but nevertheless show lower risks. Trying to make sense out of her findings, Yuki Hanada asks a colleague for an explanation.

Her colleague brushes off her observation by stating that banks are not really good at assessing risks and what banks call monitoring is not much more than a boozy dinner with senior managers. Unsatisfied by this explanation, she seeks further advice to explain this apparent negative relationship between monitoring and the default risk of companies.

How would you respond to Yuki Hanada's inquiry?

Indicative answer: *There are two components that need to be distinguished. There is firstly the difference between bonds and loans. Bonds are generally not monitored and hence there are no constraints on the investment decisions of companies, apart from incentives through the loan rate. Bondholders will only lend to the company through a bond if they deem that the investment decision of the company is not too risky, and they ensure this by charging a loan rate which is sufficiently low; this however, necessitates that the risks companies are taking is sufficiently small to generate sufficient return to bond investors. In contrast to that, if companies are monitored by banks the choice of high-risk investment can be prevented or made more difficult. With no or lower incentives for banks to choose high-risk investments, banks can charge higher loan rates, which then in turn allows higher risks to be taken by companies while the bank still makes a profit. Once companies are monitored by banks, the level of monitoring will depend on the incentives of banks. If multiple banks monitor a single company as they have jointly provided loans, each bank may reduce the level of monitoring, but as multiple banks conduct monitoring, the overall effect is nevertheless that the level of monitoring increasing, which can explain the lower risks of those companies compared to companies that are monitored by only a single bank.*

Model(s) used: Chs. 3.2.2, 3.2.3

Problem 17

Alten Valley is a remote but relatively prosperous community, consisting of a mixture of farms, wellness hotels and associated gastronomy, traditional craft shops with a worldwide market, and a small mining operator extracting high-quality coal used in art supplies. Due to its remote location, banking services in the area are very limited and consequently businesses have managed by using loans between each other as the need arose, but wealthy private individuals also provided loans. During the annual summer festival, the idea emerges that the businesses in the community should set up their own bank. During the coming days, with clearer heads, the idea is discussed again and again. Those opposing the creation of a bank point out that the current system of businesses and individuals lending to each other works well and therefore a bank is not needed, it would merely add costs. Supporters of the bank suggest that costs might actually be reduced, even though all agree that arranging the loans and negotiating the terms are neither time-consuming nor difficult. They also point out that in a neighbouring valley, a pure farming community, a similar approach had been tried a few years ago and it did not work and they reverted back to the old system of direct lending. In particular the lenders were reluctant to provide deposits to the bank that it could then subsequently lend out, instead preferring to continue lending directly.

What could the argument of those suggesting lending costs for companies will reduce, be?

Indicative answer: *Currently loans are provided directly between lenders and borrowers, thus each lender is exposed to the full risk of the loan. In case a bank is set up, the bank would provide multiple loans and the proceeds bundled before being paid out to depositors. This implies a diversification of the loan portfolio and hence reduces the risk. With reduced overall risks, the risk premium, if we assume market participants to be risk averse, will be reduced. Thus the bank will be able to offer loans at lower interest rates than individual lenders would be able to achieve. The benefits of diversification can now be split between borrowers and depositors such thaty depositors obtain sufficient interest to make depositing funds in a bank more attractive than direct lending. The reason the neighbouring valley was not successful, can be attributed to the fact that as a pure farming community the diversification benefits very limited due to high correlations between loan outcomes. This means that the benefits to banks are not sufficient to induce lenders to deposit their funds into the bank. Alten valley, however, is very diversified and the correlation of loan outcomes would be higher, resulting in higher benefits that could be sufficient to generate the requisite benefits inducing lenders to deposit funds with the bank.*
Model(s) used: Ch. 3.3

Problem 18

Fremontir has a banking system that used to be dominated by only three banks, although they were seen being competitive, the competition authority decided that competition between more banks would increase the choice for depositors and borrowers alike and decided to require banks to split up such that a total of eight new banks were created, giving a total of 11 banks competing nation-wide. To their surprise, it was found that the loan rates banks charge have increased after this measure has taken effect. In their investigation of the causes, they take into account any changes in the risks of companies that obtain loans and also any increases in the costs that banks may face, and even after correcting for any such effects, the loan rates were found to be higher than before the split of the banks. It seems contradictory to suggest that competition between banks has reduced and there is no evidence to suggest that.

How can you explain the observation of loan rates increasing after banks have been split up?

Indicative answer: *With the number of banks increasing from three to eleven, each bank will be smaller than before they were forced to split up. It will there be that*

each bank provides less loans than before, reducing the diversification of their loan portfolio. Thus the increased risk of their loan portfolio will require them to charge a higher loan rate, compensating them for the increased risk they are taking.
Model(s) used: Ch. 3.3

Problem 19

Since the advent of online platforms for borrowing and lending, the amount of deposits private households faced has gradually declined. Deposits have been invested into money market funds that are traded on an exchange and invest in government securities mainly. In addition, direct lending portals have become increasingly popular. Potential borrowers, small firms and individuals borrowing \$10,000 or \$50,000, provide standardised information about themselves on the portal, state the purpose of the loan and suggested terms. Lenders can then evaluate these offers and make counter-offers for a loan of \$1,000 to any of the borrowers. The loans will only be paid out if the target amount is reached, i. e. 10 or 50 borrowers agree terms with a lender. Banks have reacted to this development by increasing deposit rates and hope to reverse the outflow of monies from the banking system. However, financial regulators have raised concerns about this development. While on the one hand they are concerned by the increasing risks household face by providing loans through direct lending platforms, they are also concerned about the risks they face when buying or selling money market funds as prices inevitably will vary with market demand. Consumer representatives, however, point out that these investments provide a much higher return than bank deposits and should therefore be welcomed.

Are there any other concerns about the developments observed?

Indicative answer: *There are additional concerns especially with respect to the online lending platforms. Each lender needs to evaluate a borrower individual based on the information provided. Thus for each loan, 10 or 50 such evaluations have to take place. This implies a substantial duplication of effort in evaluation of lenders but also in negotiation, causing a loss in economic efficiency. The arrangement may also not be as efficient for borrowers as they might think. Diversification of risks for borrowers will be very incomplete unless their funds are substantial, hence they are exposed to higher risks than a bank would be. This will require higher loan rates to compensate lenders for these risks, making loans potentially more expensive than they need to be. Finally, the move from deposits to money market funds and direct lending undermines the liquidity insurance provided by banks. Deposits can be withdrawn at any time and allows household to use their wealth for consumption if they wish to do so. With money market funds, they can trade these, but the price they receive will not be certain, introducing additional uncertainty to households, and direct loans cannot be accessed at all, limiting consumption choice. This will reduce economic welfare.*
Model(s) used: Chs. 3.1, 3.2.1, 3.3, 4.1

Problem 20

Claassen Finance Ltd. is a privately owned institution that grants loans financed by a small number of selected large investors that provide the funds in form of deposits. Given its characteristics, it is not affected by banking regulation and as such is able to focus its business on the provision of loans to selected companies looking for large loans, which they seek to provide alone. While they had initially some success, they find it more and more difficult to retain their borrowers as they all are able to secure loans at better conditions by borrowing smaller amounts from different banks. Their analysis suggests that these better loan conditions are not attributed to lower costs of banks, but some of the differences seem to be associated with banks systematically assigning lower risks to their former customers, but there remains a significant component that is not explained by different risk assessments. Claassen Finance Ltd. cannot see how they always assess companies as more risky than banks and the data they have from monitoring companies they have given loans to, suggest that their risk assessment was broadly correct.

Can you advise Claassen Finance Ltd. of the reasons for their observations?

Indicative answer: *Banks, as indicated, will grant only smaller loans and companies therefore will have to seek loans from several banks to meet their demand. The consequence is that all banks monitor the company and this monitoring by all banks combined will be more effective than the higher monitoring effort by Claassen Finance Ltd. alone, reducing the risk of the company to the banks. This will explain the lower risk assessment of the banks and contribute to a lower loan rate being offered by banks. In addition, as Claassen Finance Ltd. provides large loans, they will not be able to give a large number of loans, limiting their ability to diversify their loan portfolio. Banks, on the other hand, provide many smaller loans to different companies, allowing for a much stronger diversification effect. This will reduce the overall risks the banks face more than it does for Claassen Finance Ltd., allowing banks to reduce the loan rate even more.*
Model(s) used: Chs. 3.2.2, 3.3

Problem 21

Reema Khalil has graduated with a degree in philosophy and recently joined Hanover Construction plc on its graduate training programme in finance. Having observed a team negotiating the extension of loans for the company, his manager asks Reema Khalil what she thinks about the demands by banks imposed on the company. She expresses her concern that the banks are going to impose quite a number of restrictions and most major decisions will be subject to consultation with the banks, so the flexibility of the company will be significantly reduced as she does not expect the banks to agree with all decisions the management might find beneficial for the company. Furthermore, as they have negotiated with several banks, she is concerned about the level of intrusion and different demands being put on the company by the banks. Her manager smiles and reassures her that while there will be restrictions on what they can do, these will not be too onerous as the level of interference by banks will not be high as they all rely on each other to discuss changes to the business. Reema Khalil is initially confused, but then finds that while banks might impose restrictions there are also benefits to the company.

What are these benefits Reema Khali's manager refers to and why will banks' interference be less onerous than it appears?

Indicative answer: *Banks will impose restrictions on Hanover Construction Ltd. that are in their own interest, the ability of the company to repay the loans; this will benefit the company as the reduced risk of default will result in a lower loan rate and if markets are competitive, the company will have negotiated a loan rate that offsets the costs of any additional constraints imposed on them. The monitoring imposed by banks will be less severe as all banks will benefit from the monitoring of any bank, causing a moral hazard. That will reduce the level of effort banks put into monitoring and what might sound as potentially onerous restriction being imposed by several banks, will turn out to be much fewer restrictions.*
Model(s) used: Chs. 2.3, 3.2.2

Problem 22

In a period of prolonged low-interest rates during a recession in the dominant mining sector of Uralia, investors have been searching for yield. Bank deposits have interests close to zero and government bonds are only marginally higher. Local entrepreneurs have developed an online platform that allows small companies and individuals to seek loans of UR$1,000, UR$5,000, or UR$10,000 at interests of 2%, 4%, or 7%, depending on the risk category they are assigned in an initial screening by the platform. All loans are fixed for 2 or 5 years. While those seeking to borrow money have to undergo an initial assessment, anyone seeking to lend money can do so. The identity of the borrower is only revealed after the loan agreement is finalised, but the amount and risk category are revealed upfront. After a rather slow start, the platform has become a popular investment tool that has been widely promoted by financial advisors and features prominently in many popular TV shows. Banks notice that substantial amounts of deposits are withdrawn and transferred to loans agreed via this platform. They are naturally concerned about the competition for their own business, which often charges a higher loan rate, and would like the financial regulator to intervene.

The banks can obviously not ask the financial regulator to intervene in order to protect their own business from competition. What argument can the banks use to convince the regulator to intervene for their benefit?

Indicative answer: *The online platform offers a mechanism to provide loans directly to borrowers. It is common that over longer time periods, individuals but also companies have unexpected needs for cash, such as a bill from a repair that was not anticipated or changes in circumstances. The direct loans do not provide a way to accommodate these requirements. Banks, on the other hand, are able to repay their deposits to all those that need access to cash. Currently lenders are attracted by higher interest on deposits, forgetting the substantial costs they may face if requiring cash. It is socially optimal to have banks conducting the lending, and all funds to be deposited with them. Therefore, while it may at the moment be individually rational for lenders to shun deposits, the overall welfare would improve if bank lending is restored fully.*
Model(s) used: Ch. 4.1

Problem 23

AgriBank plc has provided financial services mainly to rural communities. The changing weather patterns do not allow their customers to plan well ahead and the demand for loans as well as the amount of deposits are highly variable. In contrast to that, Industrial Bank plc operates in a more stable market, serving small and medium sized enterprises as well as private customers of the upper middle class. Industrial Bank plc is much more profitable than AgriBank plc, even though the credit risk both banks take are similar. Many private investors attribute the lower performance of AgriBank plc to an inefficient management and high costs in a more rural setting.

Is there an alternative explanation for the lower performance of Agribank plc?

Indicative answer: *The demand on the deposits for AgriBank plc are described as variable, while the environment for Industrial Bank plc is seen as more stable. The consequence is that the likelihood of AgriBank plc seeing the withdrawal of deposits is higher than for Industrial bank plc, necessitating AgriBank plc to hold higher cash reserves. With higher cash reserves, AgriBank plc will be able to lend out less of their funds than Industrial Bank plc; given that the provision of loans generates the profits of the bank with cash reserves not attracting any interest, the profits generated by AgriBank plc will be lower. It is thus not the inefficiency of the management or other costs that necessarily drive this result, but the different customer base of these two banks.*
Model(s) used: Ch. 4.1

Problem 24

The Ministry of Finance has assembled a task force to improve the competitiveness of the banking sector. In a first informal discussion of the areas to investigate further, a number of members express the opinion that with increasing use of technology banks would become obsolete and seeking to promote the use of online tools would be the best way to improve the banking system by eliminating it. While many disagree with that view, they quickly settle on investigating the question of how to make alternatives to banks more efficient in matching households and companies with demand for loans to those with excess funds they seek to invest. Allowing this matching and also agreeing the terms and conditions of any such loan, along with monitoring of borrowers, should be an area to investigate further. Some additional suggestions are made that any such arrangement would have to be accompanied by an efficient trading facility for loans to ensure that lenders can obtain cash if needed. A small number of members of the task force are, however, trying to direct the discussion away from this idea to make banks redundant. They say that banks have their role in society, even if markets are perfectly competitive they will not be superfluous.

Is the majority of the task force right to seek to eliminate banks by making alternatives more efficient? Explore the thinking behind each group's position.

Indicative answer: *The first group see banks as pure intermediaries and believe that eliminating any transaction costs leaves banks without any role. If no such costs exist that justify the role of banks, or these costs can be borne otherwise by an online platform, then banks have no specific role, although it can be argued that the online platform then takes on the role of a bank. However, even the supporters of this view seem to recognise that lenders might need to access their monies during the life-time of the bond and suggest that this could be achieved through trading these loans. This captures the essence of the view of those seeing banks as indispensable as they provide this liquidity insurance. Banks allow depositors (lenders) to withdraw their funds at any time, without the need to find a buyer for the amount deposited in the bank. This increases the overall welfare, even if banks are fully competitive. Thus there is a place for banks in an economy as they provide a unique service.*
Model(s) used: Chs. 2.1, 4.1

Problem 25

Chania has undergone yet another banking crisis that has resulted in the collapse of its entire financial system. The same has happened 11 and 7 years ago. In all three cases, it was depositors that lost trust in the stability of the banks and rather than risk losing their deposits, sought to take out cash. The origin of the loss of trust has never been established and in none of the banking crises has there been an obvious trigger. Fearing a cycle of ever-repeating banking crises, prominent politicians suggest to overhaul the way banks are operated. Their idea is that all deposits from the public will have to be fully covered by reserves held in either cash or at the central bank. Any lending would be administered by the banks, but on the basis of loans provided to them by a newly established 'Growth and Innovation Bank', which would be financed by the central bank. They claim this would prevent depositors losing any money and therefore make banking crises impossible, while at the same time maintaining the flow of loans to the economy. Presenting his ideas at a conference attended by leading bankers and academics, these ideas are less than politely rejected as not only questionable to ever work given the level of interference by the 'Growth and Innovation Bank' in allocating funds for loans, but also as fundamentally flawed.

Sitting next to senior bank manager, he leans over to you and carefully asks, what fundamental flaws some people are referring to. What would you reply?

Indicative answer: *In such a banking system, banks could not invest any of the deposits, apart from holding them as reserves at the central bank. In this sense the deposits are not contributing to the provision of loans, which should reduce economic growth. Of course, the 'Growth and Innovation Bank' could also exist alongside traditional banks, if this was desired, its existence, therefore, makes no difference in principle. If we were to abolish traditional banks, direct lending from 'depositors' would emerge and thereby the funds they have available would contribute to economic growth, unlike in the proposed banking system. While the direct loans are imperfectly liquid, this would not be as good as a traditional banking system, but it would be an improvement over the proposed banking system.*
Model(s) used: Ch. 4.2.1

Problem 26

Concerned about the ability of banks to be able to honour all deposit withdrawals in a financial crisis, some commentators in the press have argued to increase the requirements for cash reserves in banks significantly. Regulators and most bankers reject this proposal and suggest that the current amount of cash reserves allows depositors to withdraw as is needed in the normal course of business; any higher liquidity requirements would damage the ability of the banking system to function properly.

Having been invited to provide your own opinion for a national newspaper on this debate, what would your position be?

Indicative answer: *Increasing the liquidity requirements reduces the amount of loans banks can provide, which will be detrimental to investment and thus economic growth. It furthermore reduces the returns banks can pay on deposits as cash reserves do not generate any or very low returns to banks. Increasing the liquidity requirements significantly is akin to a road leading to narrow banking as the deposits the bank obtains cannot be lend out as much anymore. Such banking reduces the welfare in the economy and is therefore inferior to the traditional form of banking with low liquidity requirements. While this might occasionally lead to bank runs, their rarity suggests that the benefits of fractional reserve banking will outweigh the costs of occasional bank runs.*
Model(s) used: Ch. 4.2.1

Problem 27

DirectLending Ltd. operates a platform to match investors willing to lend funds with companies seeking loans for investments. They offer standardised loan contracts with set times to maturities and loan rates reflecting the risks of the companies seeking loans. They promote their platform as an alternative to deposits for a wide range of customers after a financial crisis that saw a large fraction of banks fail with many depositors losing large fractions of their deposits. Taking out an advert in a leading newspaper, DirectLending Ltd. claims that banks are too unsafe and they should not be allowed to lend out money they promise can be taken out by customers at any time. In response to this advert, the Association of Banks claims that banks in their conventional form are offering a valuable service to their customers and that the proposal would harm the welfare of the country.

Why does DirectLending Ltd. make this claim that banks should not be allowed to lend out deposits?

Indicative answer: *Conventional banks allow the implementation of the social optimum of resource allocation by retaining a small fraction of deposits as cash reserves to accommodate any deposit withdrawals during normal times. This means that the presence of banks is providing a higher welfare than relying on direct lending through companies such as DirectLending Ltd. On the other hand, by not allowing banks to lend out deposits, direct lending by 'depositors' is a superior solution than operating a narrow banking system. As this would imply more business activity for DirectLending Ltd., increasing their profits.*
Model(s) used: Chs. 4.1, 4.2.1

Problem 28

Marcel Schnurli is an advocate of a reform of the banking system. His claim is that banks make excessive profits at the cost of depositors and borrowers alike. He acknowledges the role of banks in providing vital services, such as making payments and their expertise in assessing the risks of potential borrowers, but believes a better way of banking can be found. In his view, banks should be provided with funds by the central bank to provide loans that otherwise would not be granted as the assessment of the borrower is too difficult for the general public, but deposits should be kept for the sole purpose of making payments and safekeeping without being lent out. Lending should be financed directly through an efficient online platform that matches borrowers with potential lenders who seek long-term investments. When defending his position in public debates he gets widespread support from ordinary members of the public, while all economic and banking experts refute the proposal as bad for the economy.

Who is right in their assessment of the idea put forward by Marcel Schnurli?

Indicative answer: *The proposal is for narrow banking on the one hand and reliance on direct lending on the other hand; both market forms are inferior to a fractional reserve banking system. The narrow banking aspect of the proposal, where deposits cannot be lend out will reduce the welfare of the economy as these funds cannot be used productively, reducing the loan amount available and earning depositors no returns. The direct lending aspect of the proposal is also inferior to a banking system as depositors cannot withdraw their funds if needed, or only incurring a loss when selling the loan they have provided.*
Model(s) used: Chs. 4.1, 4.2.1

Problem 29

Angelsia has been gripped with the third banking crisis in 11 years and after having bailed out the 4 main banks yet again, a parliamentary commission is established to look at the future of banking in Angelsia such that future costs of failures can be eliminated. It is quickly established that in all cases the cause of the crisis was, as previously, the spread of largely unfounded rumours about the banks through social media. The establishment of a deposit insurance system had been discarded after previous crises by votes in parliament and it seems that there will be no majority for such a system; most members of parliament are seeking a more radical solution to address the problem at no costs to the public. Suggestions are being heard from outside the banking sector that propose a government-backed lending scheme, operated at arm's-length by the now rescued banks. Banks would be allocated an amount they are free to lend and would be held responsible for to the government in that any shortcomings in returns have to be covered from the profits of the banks. Banks would continue to take deposits from the general public, but hold these against government securities to pay some interest to depositors. Other alternative suggestions are that depositors should be prevented from withdrawing their funds during times of crises and instead would be able to obtain only an ever diminishing fraction of them, making losses as they do once deposit withdrawals exceed a certain threshold.

Would any of these two solutions be a feasible alternative to the current banking system?

Indicative answer: *These proposals refer to narrow banking and using a system similar to withdrawing deposits at market value only. Both alternatives are inferior to the normal banking system as they provide lower social welfare. Narrow banking makes deposits unavailable for lending and thus causing an inefficiency and the use of market values for deposits in case of withdrawals introduces and additional uncertainty to depositors that reduce their welfare. Thus on first sight the alternatives are not an improvement to the current banking system. It has, however, be balanced against the costs arising from the frequent failure of banks due to sudden depositor*

withdrawals. Both alternative suggestions are not subject to such withdrawals as in the first case the deposits are fully covered by government securities and in the second case withdrawals would impose costs on depositors, making this less attractive. Hence the costs of bank failures should be significantly reduced. The loss of welfare from a suboptimal banking system has to be balanced against the losses from bailing out banks. If bailouts are frequent and there is an expectation that this would most likely continue n the future, the proposals might well be feasible and an improvement on the current situation. If the need for bank bailouts is very low, however, the welfare losses are most likely to be higher.
Model(s) used: Chs. 4.2.1, 4.2.2

Problem 30

A regulatory review of the banking system in Odomantis has been launched. Many observers think it lucky that Odomantis has been spared a major banking crisis in recent years, despite many of their main trading partners either having faced a banking crisis or having to take significant steps by the central bank and government to avert such a crisis. A main concern is that depositors in banks lose trust in the stability of their bank and withdraw their deposits, something that cannot easily be controlled through regulation. While many measures have been proposed to improve the governance and risk management of banks to alleviate any concerns that deposits are not safe, it is seen as prudent to address the threat of large-scale deposit withdrawals. Intervening in deposit markets at any point can easily be seen as a sign of weakness of a bank and accelerate any deposit withdrawals, or even trigger such withdrawals even if there is no cause of concern. With banks working well most of the time, it is desirable to not intervene during normal times. Only during times an individual bank or all banks are under stress should an intervention be considered. To make any intervention conform with market principles, a consultation is launched on the following idea: if the withdrawal of deposits is such that, if it continues, the bank is less than 4 weeks from failure, deposits are not repaid in full. Instead they are operating on a sliding scale where the more deposits are withdrawn, the less is repaid. Those depositors remaining with the bank will subsequently see their deposits repaid with bonuses from these savings made by not repaying withdrawals fully.

This proposal has led to a fierce backlash from consumer associations, but would it address the problem of banks failing from deposit withdrawals?

Indicative answer: *If the amount a depositor receives in such a situation is appropriate it should prevent any further bank run, assuming depositors are acting rationally. The reason is that with every further withdrawal of deposits the amount obtained reduces, while at the same time depositors retaining their deposits will receive higher payments. If the values are chosen accordingly, the incentive to withdraw deposits are eliminated and should stop. Of course if the bank is fundamentally weak in*

that the loans they have provided are accumulating losses, then the payments to the remaining depositors will not be enough to ensure they do not withdraw, too.
Model(s) used: Ch. 4.2.2

Problem 31

Alternative Bank eG is a newly formed mutual bank that seeks to offer socially responsible banking. This is not only reflected in the types of businesses that can obtain loans from the bank, but extends also to the behaviour of their depositors, who are also supposed to act socially responsible. To this effect the bank allows depositors to withdraw up to €500 per week without loss of interest, but any higher withdrawals will subject to a penalty which is determined daily based on the amount of withdrawals the day before. While many support the ideas put forward by Alternative Bank eG, they are barely able to attract depositors, despite offering higher interest on deposits than most other, conventional, banks.

Why does the high interest on deposits not attract more customers?

Indicative answer: *The key difference of the deposits offered by Alternative Bank eG to that of other banks is that the amount that will be repaid is uncertain as it depends on the withdrawals of other depositors, while for conventional banks the amount will be fixed. While this arrangement is not the same repaying the market value of deposits, this arrangement has the same properties. In particular, it introduces uncertainty about the repayment amount, which reduces the utility deposits can generate from, using Alternative Bank eG. Clearly, the higher nominal interest rate on deposits doe snot fully compensate depositors for this risk.*
Model(s) used: Ch. 4.2.2

Problem 32

Banks frequently offer customers accounts that severely limit access for longer periods of time or even do not allow any withdrawals for a specific time period. The interest of these accounts, when compared to accounts that offer unrestricted access, is often substantially higher. Despite these higher interest rates, uptake of these accounts is typically low, which is commonly explained with the preference of depositors to be able to withdraw deposits at short notice. However, banks still offer these accounts, despite them being more expensive. Being new into the banking sector, having recently been hired into a senior position from the retail sector, you question this strategy from a purely financial point of view, acknowledging strategic objectives in binding customers to the bank.

How would a more experienced colleague explain the reason for offering such accounts?

Indicative answer: *While the accounts look more expensive to the bank on first sight, the interest paid over the same time period would be higher than for accounts with unlimited access, the expected profits from both accounts are identical. This is because with long-term accounts, any risk from our bank failing is accumulated throughout the lifetime of the account. With loans being given long-term, this means that these risks are realized only after many years. With accounts that can be accessed, depositors are repaid frequently and until loans mature obtain risk-free returns and only the money deposited in the final time period would be at risk, hence they would require lower interest rates as their potential losses are lower. For the bank, however, it means a constant outflow of interest to be pais that cannot be recovered if loans are not being repaid. With an appropriate pricing strategy, these two effects cancel each other out and both accounts are the same costs to us. It makes therefore sense to offer these accounts if there are other strategic benefits associated with long-term deposits, given they do not cost any more.*
Model(s) used: Ch. 4.3

Problem 33

Comparing interest rates at banks, you see the following two types of savings accounts and are attracted to those offering terms of 2 years as you are reasonably sure you would not need access to your money for that time period. The first account pays interest annually with 5% p.a. in the first year and 7.25% p.a. in the following year. The other account pays 6.5% p.a. in each year, paid accumulated at the maturity of the account. You are aware that the bank in question mostly provides consumer loans with maturities of roughly 2 years. As the interest paid on the second account is higher overall, you think it is a obvious to choose this account.

Would the first account only be attractive to those depositors relying on interest payments in each year as a source of income?

Indicative answer: *If deposit markets are competitive, the expected returns should be equal for both type of accounts. What the deposit rates do not reveal, is the risk of the deposits not being repaid. This will only happen once it is clear that the loans are not repaid to the bank, thus any interest in the first year will be paid for sure, while the interest and deposit in the second year will only be paid if the loans the bank has provided are repaid. With the first account, the depositor will obtain some interest payment for sure, while with the second account both interest payments are at risk. It is these different levels of risks that seem to make the second account more attractive, but it exposes the depositor to higher risks.*
Model(s) used: Ch. 4.3

Problem 34

Driven by the desire to reduce the costs of a large number of small banks, government and central bank policy in Soratia encourages the consolidation of the banking sector through mergers. While many saw this move critically as competition between banks would be reduced, others have denied that this is a likely effect. They claim that a substantial number of banks will remain and that no locally or regionally highly concentrated markets would be allowed. Assessing the impact of the mergers conducted to date, the competition authority of Soratia has asked the public for submissions to assess the impact of the consolidation so far. The Chamber of Commerce is one of those having prepared a wide-ranging submission, mainly taking into account the experiences of small and medium-sized companies. While most experiences are relatively homogenous across the companies and across regions, there are large discrepancies when it comes to the lending policies of banks. In particular, some companies report that access to credit has stayed the same or become sightly easier, especially as banks are much more flexible in granting credit lines; others report the exact opposite experience and their access to credit is much more difficult now. Analysing the responses by companies on this point, it is noted that there seems to be no specific pattern to exist for specific regions, company types or even obvious bank characteristics. It emerges after significant data work that those experiencing the most problems with access to credit seem to be those companies whose banks chose to merge with banks in different regions but serving a similar customer base. On the other hand, those reporting easier access to credit were using banks that decided to diversify by merging with banks that operate in different segments of the market, whether these banks were located close or far.

How can you explain this observation?

Indicative answer: *Banks provide credit lines and if these are taken up, they need additional funds to meet this demand, which means accessing the interbank market or other sources. Generally the larger a bank is, the larger its aggregate credit lines will be and hence the larger the funds it will need to raise. As raising large amounts of funds will be more costly, larger banks face higher costs and would therefore reduce credit lines. This accounts for less easy access to credit in general in light of the consolidation. There is a second effect, though, that arises from the correlation of such demands on the funds of banks. If demands by companies are highly correlated, the costs are potentially very high as if credit lines are used, the demand for funds will be high, increasing costs significantly. Lower correlations make such high demand less likely and therefore reduces costs, making banks more willing to provide credit lines. In the case of the mergers in Soratia, some banks merged with those covering similar markets, hence the correlation in demands for loans will be approximately stable and the effect from the larger size of the bank dominates, reducing the availability of credit. Those banks that sought to diversify their operations, will probably also reduce the correlation in demand as there different industries or different types of companies will not have the same needs at the same time. This will lower the demand for loans at any point in time, reducing the size of funds that need to be raised and due to the lower costs, they are more willing*

to provide loans. The effect of the increased bank size is overshadowed by the effect of the lower correlation in loan demands and banks grant credit lines more easily.
Model(s) used: Ch. 4.4

Problem 35

Corneus Ltd. produces medical equipment used by ophthalmologists and is well established in the market with strong cash flows and highly profitable. Occasionally some customers have to delay payment for their orders, although defaults are virtually unknown. To avoid any cash shortages, Corneus Ltd. has agreed with its bank an overdraft facility that has been available for many years. At its annual review date, the bank rather unexpectedly announced that this overdraft facility will be reduced by a third. The Chief Financial Officer of Corneus Ltd. questions this decision as he cannot see any detrimental developments within the company. Their customer advisor agrees that this reduction in their credit lines is not in response to a negative outlook on the company, but rather reflects a general policy decision by the bank to reduce overdrafts and credit lines, especially to companies who rarely use them, like Corneus Ltd. On being probed further, the bank tells the CFO that this is in response to their own liquidity challenges. The bank over the last few years has observed that the use of credit lines and overdrafts has often coincided with deposits being withdrawn, in some cases requiring the bank to seek additional liquidity from the interbank market. While in the past the uptake of credit lines and overdraft had increased, this has reduced recently in the more benign economic climate. In reaction to these developments, the management of the bank has decided to reduce the overdrafts they provide in order to protect their own liquidity position.

How can you explain the decision of the bank?

Indicative answer: *The bank faces an increase in the correlation between deposit withdrawals and the uptake of credit lines. As indicated by the bank, this may cause shortages that the bank has to cover with often costly interbank market loans. Initially the uptake of credit lines was quite high, making the additional liquidity the bank held to accommodate these possible take ups, profitable, making bank happy to increase credit lines. As the bank maintained credit lines, we can assume that these two effects approximately cancelled each other out. Now with the take-up of credit lines falling, the higher cash reserves are no longer profitable and banks start to reduce them in order to reduce cash holdings.*
Model(s) used: Ch. 4.4

Problem 36

Choming Bank has been subjected by the Regulatory Authority for Banking to severe criticism for its low cash reserves, which on several occasions in the past months lead to them requiring emergency loans from the central bank. In discussions with the Regulatory Authority, representatives from Choming Bank point out that they have repeatedly been caught out by unexpected uptakes of loan arrangements that have been agreed months and in some cases years earlier, combined with higher than expected deposit withdrawals by large corporate clients. They believe that the unexpectedly well-performing economy has lead to a significant increase in investment, causing companies to demand more loans and reducing excess deposits. The Regulatory Authority responds by saying that this can hardly be the case, Choming Bank does hold too little cash reserves or needs to find more long-term sources of funding to avoid having to rely on emergency assistance by the central bank. In a further exchange they claim that increasing either cash reserves or long-term funding will increase their costs and make them less profitable, putting them at a disadvantage to other banks who do not face such measures. Having published the minutes from these exchanges, banking analysts are pouring over the arguments and many dismiss the analysis of the Regulatory Authority that Choming Bank held inadequate cash reserves and support their assertion that having to use more long-term funding is detrimental to their profits.

How would they explain the need for emergency loans by the central and the negative impact of long-term funding on Choming Bank's profits?

Indicative answer: *Choming Bank claims that they have been caught out by higher than expected coincidences of a high take up of credit lines and high deposit withdrawals, implying that the correlation between these events has increased, probably together with the incidence rate itself. If the economy has performed better than expected, this is a reasonable consequence and the cash reserves prior to this unexpected change might well have been adequate; it was only in hindsight after knowing how the economy had changed that the vash reserves turned out to be smaller than they should have been. Even with adequate cash reserves, banks facing larger deposit withdrawals or a high take-up of credit lines might require central bank loans, it is more cost-effective to rely on such loans than hold large cash reserves. Requiring more long-term funding will not affect the profits of the bank, however, although the interest paid to short-term deposits are lower. However, it has to be taken into account that the larger interest payment on long-term loans is only payable if the loans the bank has given is repaid. In contrast to that, with short-term deposits, only the final interest payment at maturity of the loan is subject to this conditional payment, balancing the overall payments the bank has to make to depositors. It is only the interest payments that are payable by a bank whose loans are all repaid that are increasing with long-term funding, neglecting the possibility of bank failures.*
Model(s) used: Chs. 4.2.2, 4.4

Problem 37

InnoTranfusion SA is a small company developing medical equipment used for the transfusion of blood in developing countries. As a spin out from a local university, it has thus far relied on the financing by venture capitalists, who in recent years used their contacts to allow the company to borrow funds from some private investors. With their recent expansion, the ability to raise loans privately has been exhausted and they had to seek a bank loan. Having been directed to a bank with a long-standing expertise in financing companies in the medical and health field, the risks of the company are assessed and a loan rate is set at 6.25% p.a. for the first year, to be reviewed annually; this compares with a loan rate of 7.4% for the last loan agreed with private investors in similar market conditions. After a successful year of developing their equipment further and having shown growth of their sales along projected lines, they are surprised to learn that the bank offers them a new loan rate of 6.8%. While changed market condition can account for an increase of 0.2% in the loan rate, the company is at a loss why the loan rate has increased beyond that. The bank explains, in response to their query, that the loan rate reflects the risks as they have assessed it. They point out that while they believe the company has good prospects, the risks they are taking has increased due to some decisions on expanding into less stable markets, which they had previously ruled out.

Why has the risk of the company increased from the previous assessment of the bank?

Indicative answer: *The bank is experienced in the market the company operates in, so it can be said that the bank has a good ability to assess their risks. InnoTransfusion SA has previously relied on the provision of loans from investors directly and now has to rely on bank loans. We can assume that due to the experience of the bank their ability to assess the risk of the company is better that of the investors. The consequence is that this higher ability of the bank to determine the risks of the company has lead to a reduction on the loan rate as they were more correctly classified as low-risk, resulting in a lower loan rate. This higher ability of the bank to assess risks, however, reduces the incentives of the company to make decisions that maintain this low risk. This will result in decisions that increase the risk, like the expansion into less stable markets. This increased risk was not anticipated by the bank but was included in the revised loan rate.*
Model(s) used: Ch. 5

Problem 38

Baudi Bank has recently expanded from its origins in the area around the city Baudi, dominated by mining non-precious metals and their processing, to the neighbouring area of Lada, which is well known for its expertise in transport logistics, being the location of a major airport, a harbour, and major road crossings. Both areas are attracting entrepreneurs who will set up innovative companies; the lack of venture capitalists in the normal sense has made these companies reliant on funding by the entrepreneur itself and then once the company becomes successful, they may get access to development funds set up by the central government, providing loans.

Once companies become sufficiently mature, these government loans are withdrawn and companies have to rely on bank loans to finance their business. It is at this stage that Baudi Bank provides loans to these companies. It has been their practice for years to assess the prospects of companies and once they had made their assessment of the current operation, determine an appropriate loan rate to which they usually added another 0.25%. When expanding into the Lada region, their process was the same, but instead of adding 0.25% to the loan rate they thought was appropriate for the risk of the company as in Baudi, they would subtract 0.25%. Baudi Bank claims this practice of subtracting 0.25% in Lada is not to offer loans at lower rates to gain market share, but reflects their position in the market.

What alternative explanation is there for this practice of Baudi Bank?

Indicative answer: *Baudi bank is in a position of knowing the business of companies in Baudi very well as they have been able to gain significant experience in assessing the prospects and risks of the companies there, but in Lada different types of companies operate and Baudi bank will not have the same level of expertise. In making these adjustments, Baudi Bank considers the impact the bank loan has on the incentives of the company to take risks. We can reasonably assume that the government organisation providing the funding in the previous state of company development is not very good at assessing risks, given the wide range of companies they have to assess; they are thus comparable to a direct lender. In Baudi the bank will have a high level of expertise and this the incentives for companies are to increase risks compared to the risks they took under government loan funding. This anticipation of higher risks is reflected in the higher loan rate. In contrast to that, in Lada the bank has a low level of expertise as the type of business operating in this region is different to what they are used to in Baudi. With low levels of expertise, even if higher than the government organisation deciding on loans, companies have an incentive to reduce the risks they are taking, which is again anticipated in Baudi Bank reducing the loan rate accordingly.*
Model(s) used: Ch. 5

Problem 39

Jamilla Ltd. is seeking a new loan to finance its ongoing operations. Due to the banking sector being poorly developed in Radustan where they are based, they have so far relied on loans provided by wealthy individuals, as do most other companies. However, with the more difficult economic situation in the country, securing new loans has become difficult. On a business trip to Maranisam, the capital, the owner of Jamilla Ltd. decides to visit two banks and explore the possibility of obtaining a bank loan. He first calls on First National Bank, which has much experience with companies in the infrastructure sector, such as Jamilla Ltd., which is an engineering company working on road and rail projects. The meeting is disappointing in that he is turned down for a loan; the comments from a senior manager at the bank is that while they can mitigate the risks of the company through adequate support, the risks of the company not repaying the loan are nevertheless too high for them. The visit to Maranisam Bank gives a better result. Although this bank admits to not having lent to many companies like Jamilla Ltd., it has a positive view of the prospects of the company and would be willing to grant the loan. There is however the condition that any major decisions of the company are first discussed with managers at Maranisam Bank. Happy to have secured the loan at more favourable rates than their existing loans, the owner of Jaramilla Ltd. finds the differences in the decisions by the two banks baffling. In both cases it seems that the risks they attribute to the business seems to be broadly similar and in line with what the private lenders have indicated, both want to influence management decisions, but the bank having a better understanding of the business turns down the loan application, while the bank having less understanding of their business approves the loan.

Is there a rational explanation for these two decisions?

Indicative answer: *All lenders assess the risks of the company in a similar way, hence different risk assessments cannot be the reason for the different decisions. Banks would want to monitor the company and they may anticipate that this will reduce the risks of the company, allowing them to grant a loan that private lender without such monitoring would not find viable. The differences in the decisions of the banks can be explained by their different levels of expertise. First National Bank has a high level of expertise in the sector Jamilla Ltd. is operating and this implies that there are incentives to increase the risk of the company, making it too risky for the bank to grant the loan, despite the risk reduction from monitoring. Maranisam Bank has a low level of expertise, given their lack of experience in the sector, and this would imply companies reducing their risk-taking compared to the current situation with private lenders. This lowering of risks makes the loan viable for Maranisam Bank anticipating this behaviour, while making it unviable for First National Bank which anticipates an increase in risks. The loan is not viable for private lenders as they are not able to monitor the company and reduce its risks.*
Model(s) used: Chs. 3.2.3, 5

Problem 40

Sluiskanaal B.V. is Dutch company that builds locks and maintains canals along many of the canals frequented by tourists. It is well a established and highly profitable company that has grown substantially over the last few years as competitors struggled to survive facing their competition. Having grown considerably, they have outgrown their current banking relationship with Amstel Bank, a bank operating locally at their main site which has known them for over 50 years, and now seek to finance a further expansion of their business through Nederlands Bank, a nationally operating bank. During their discussion with the loan officer of their new bank it has become apparent that he has no real understanding of their business, unlike staff at their former bank.

They are nevertheless pleased to obtain a loan offer with a loan rate that is below what they could secure previously. They are even more surprised about the offer as they notice that Nederlands Bank has assessed the risks faced by Sluiskanaal B.V. higher than Amstel Bank had.

As there is no evidence that the costs of Nederlands Bank are lower than for Amstel Bank, how do you explain the lower loan rate offered to Suiskanaal B.V. and will this lower loan rate persist in the future?

Indicative answer: *Amstel Bank would have had good knowledge of the company and its operation, making it easy for the bank to assess the risks and prospects of the company. This good knowledge will lead to a higher loan rate as the bank will anticipate that companies in such a situation have an incentive to increase the risks they are taking compared to a baseline case where lenders provide loans directly. With Nederlands Bank having a much less detailed knowledge of the company and will therefore face more difficulties in assessing their risks properly. It in such a situation the company has an incentive to reduce risks compared to the mentioned benchmark. It is thus that with Amstel Bank the company had an incentive to increase risks, resulting in a higher loan rate, while with Nederlands Bank the company has an incentive to reduce risks, giving it a lower loan rate. This result is true for the same level of risk assessment, it is therefore that Sluiskanaal B.V. is able to obtain a better loan rate at Nederlands Banks. As Nederlands Bank bets to know the company better, it should also improve its ability to assess the risks, resulting in a less and less incentives for Sluiskanaal B.V. to reduce risks, leading to an increase in the loan rate.*

Model(s) used: Ch. 4.4

Problem sets for Part II

Problem 41

Sjeverne Komunalije d.d. is a highly regulated utility company whose decision-making is regulated and audited by the national regulator with all board minutes being routinely published in a timely manner, remuneration of all managers published, and expenses tightly controlled. Given the high level of transparency and its profitability, Sjeverne Komunalije d.d. has no problem, securing loans at very favourable rates. A major shareholder of the company laments that the high amount debt of the company is detrimental to its profits and suggests that rather than paying interest to banks, the company seeks funding that makes repayments based on the performance of the company.

Would such performance-related funding be more beneficial to Sjeverne Komunalije d.d.?

Indicative answer: *The high transparency of Sjeverne Komunalije d.d. does not allow them to publish a lower performance than it has actually achieved, this will make it optimal for the company as well as the lender of funds to use a contract where the lender participates in the profits of the company rather than receives a fixed amount as repayment. Sjeverne Komunalije d.d. will not be able to reduce these payments to the lender given its high level of transparency, not is there a way to reduce the actual profits through decisions that are detrimental to the company at the time of the repayment.*
Model(s) used: Ch. 6.1.1

Problem 42

Barstow Construction plc and Combined Software plc have at the same time issued a bond whose repayment will depend on the performance of their respective companies. The issue of such a bond was a surprise to the market in case of Barstow

Construction plc as the company is known for its conservative and very cautious approach in term of decision-making and also the financing of the company. Combined Software plc, on the other hand, has always been more innovative in their financing decisions and they are also known to make bold decisions when operating their company. What is notable is that after adjusting for other different terms in the two bonds, Barstow Construction plc will use 12% of the value of their company to repay the bond, while Combined Software plc only has to use 7% of their company value, despite having a higher risk.

How do you explain the difference in the repayment values between these two companies?

Indicative answer: *Barstow Construction plc is described as being conservative in decision-making and financing, this would imply a high level of risk aversion and this implies a high fraction of the company value being used to repay the bond. However, Combined Software plc is less risk-averse as it is described as being innovative and bold, giving rise to a lower fraction of the company being used as repayment for the bond. The higher risks are not relevant as they will be compensated fore by the higher return on the company value and hence a higher value of the company, assuming the positive risk-return relationship holds.*
Model(s) used: Chs. 6.1.1

Problem 43

Harrison LLP is operating a hedge fund that specialises in providing innovative loan solutions to companies. On the condition that one of the partners of Harrison LLP becomes a board member of Sulyeog Baljeon, a Korean company generating electricity using hydroelectric dams, they have agreed to provide a loan whose repayment is dependent on the performance of the company. If the company returns more then 6% p.a., the loan does not need to be repaid, while if the companies shows a lower return, its full value including accrued interest of 4.5% p.a. have to be repaid. Such a loan agreement is entered into by Harrison LLP with the aim of diversifying their portfolio. Sulyeog Baljeon rejects the demand by Harrison LLP to obtain a seat on the board and the loan is not agreed.

Why is the appointment of a board member for Harrison LLP so essential?

Indicative answer: *Such a loan contract relies on the company not being able to overstate their performance and thereby to avoid having to repay the loan. Having a board member allows Harrison LLP to get an insider's view of the company and thus verify that the company performance is actually above the threshold. This reduces the informational asymmetry between Sulyeog Baljeon and Harrison LLP, making the loan contract feasible.*
Model(s) used: Ch. 6.1.2

Problem 44

Convay Finance Ltd. provides a loan to Proven Technologies Ltd. and they specify a loan rate of 5.75% p.a. with a time to maturity of 8 years. Having been recently hired as a graduate at Convay Finance Ltd. you are surprised that the loan rate is not set higher as there seems to be no competitor who will offer them terms below 6.5% p.a. and the profitability of Proven Technologies Ltd. would easily allow them to pay such a higher rate. You are dismissively told by your manager that a higher loan rate would not be worth the hassle.

What is the hassle that your manager refers to?

Indicative answer: *With a higher loan rate, the repayment requirement is higher and thus the likelihood of Proven Technologies Ltd. failing to repay its loan is higher; this would then necessitate Convay Finance Ltd. to initiate a costly auditing process. It is thus that the expected costs from auditing the company are higher and these costs seem to outweigh the benefits of the higher interest income, as suggested by the manager.*
Model(s) used: Ch. 6.1.3

Problem 45

Samamoto GK specialises in the development of software for automated warehouses and has acquired new clients for which it needs to hire additional programmers, necessitating a loan to finance their salaries until invoices are due. In order to obtain the best loan conditions, Samamoto GK has approached its bank and also two of their investors for a loan. They are surprised to receive an instantly positive response from all they approached, especially from their bank as they have in the past shown very little knowledge and understanding of their business model. The bank offers them a loan at 7.25% p.a. over 6 months, when it is due to be repaid in full, which coincides with the due date for the payment from their new clients. One of the investors, who has financed them since they were founded as a venture capitalist, and is a member of their board, offers them to finance their costs in return for a share of 15% of the profits they generate from the new clients. The second investor has only recently joined the company and also sits on the board; he offers them a similar option to the other investor but requires only 12% of the generated profits. This latter investor specialises investing into well-established companies seeking to expand.

Why do the bank and the investor offer so different form of financing Samamoto GK and why do the two investors offer different terms?

Indicative answer: *The bank has little knowledge of the company and will therefore not have the requisite information to assess the outcome of the investment into the new clients; this would allow the company to make misleading claims on the profits the new clients generated, necessitating the bank to instigate a costly audit. It is therefore that a traditional loan is offered to minimise these audit costs. The*

investors, however, are not only familiar with the company but as board member have deeper insights into the company and will therefore easily be able to verify the profits the company generates. This allows them to offer finance that allows them to participate in the profits of the company. The venture capitalist is less risk averse than the investor making investments into more mature companies only. This can be inferred from the nature of their investments with venture capital being much more risky than equity in mature companies. It is for this reason that the venture capitalist seeks a higher share of the company's profits.
Model(s) used: Chs. 6.1.1, 6.1.3

Problem 46

Chada Rattanakosin invests into mid-sized companies seeking to expand their business by exploring new markets. She typically offers companies loans with a time to maturity between one and five years, where the loan rate would depend on the risks of the business. For longer times to maturity she usually offers to make an investment into the company requiring the finance that allows her to participate in the profits of the company or the increase in its value.

How would Chada Rattanakosin justify her approach to provide loans for short-term finance and direct investment into the company for long-term finance?

Indicative answer: *As an outside investor Chada Rattanakosin would have only limited insights into the true financial position of the company she invests in. Without being able to reliably verify the profits and thus value of the company making direct investments are not beneficial and traditional loans are preferred as they reduce the need for a costly verification of the value of the company (audit). Making direct investments into the company for long-term finance suggests that this uncertainty is reduced. This might be the case that while for short period of times profits can be hidden from outside investors, and thus the value be reduced, but over longer time periods basic reporting requirements will make this much less feasible. It is therefore that Chada Rattanakosin is confident to be able to obtain a fair value for her investments in the long run, which she is not able to secure in the short run.*
Model(s) used: Chs. 6.1.1, 6.1.2, 6.1.3

Problem 47

Alejandro Meceta leads a team of loan officers that within their bank are responsible for lending to companies in the automotive supply sector and has built up considerable expertise over many years. He and his team pride themselves in having a solid understanding of the companies operating in this industry and the market as a whole. Their expertise is widely acknowledged and based on their lending to many of the leading companies in the sector. Their customers stay loyal as he is usually able to provide them with better loan terms than his competitors. The head of corporate loans, Arthur Delamaitre, acknowledges his team's level of expertise but is concerned that he has not been able to expand his customer base for a few years and suggests to approach companies in the sector that are borrowing from banks with less well informed loan officers. Alejandro Meceta says this will not be a successful strategy as those companies are mostly less well established and therefore more risky. Arthur Delamaitre responds that they should just charge them a higher loan rate, that's fine from a risk perspective.

Why does Alejandro Meceta think this strategy will not be successful?

Indicative answer: *Alejandro Meceta has considerable expertise, thus he will have precise knowledge about the companies, which other banks do not seem to have as they cannot compete with his loan rates. It is mainly company with good prospects, the leading companies, that he is able to correctly identify as such. As other banks are less informed, they cannot offer the same low loan rates. The companies these other less well-informed banks are lending to are therefore companies with less positive outlooks and thus higher risks. Alejandro Meceta's expertise would be able to identify their risks correctly, but this would mean that the loan rate would be high; the less well-informed uninformed banks would be able to charge a lower loan rate due to their inferior information, as they cannot fully appreciate the risks of the companies. It is thus that Alejandro Meceta's team would in most cases quite higher loan rates than their existing bank, making the attempt at entering this market futile.*
Model(s) used: Ch. 6.2

Problem 48

Norsk Presisjonsmekanikk ASA is a manufacturer of parts used in aircraft engines and turbines. After years of having gone through restructurings and having twice nearly filed for bankruptcy, they are now recovering and gaining market share again, but substantial risk remains for their recovery. Their bank, SHV Bank, has throughout this difficult time period supported the company with loans and advice. Negotiating a new loan to allow the company expanding further, SHV Bank is surprised to learn that Norsk Presisjonsmekanikk ASA has received a loan offer with a loan rate 0.8% below what they are willing offer. Although Norsk Presisjonsmekanikk ASA is not dilvulging the identity of the bank making this loan offer, they are sure that the bank will have not even a basic understanding of the situation Norsk Presisjonsmekanikk ASA is finding itself in. They further mention that in the past this other bank also made them loan offers, but they were not better than what SHV Bank did offer.

How can it be that a less will informed bank makes a better offer to Norsk Presisjonsmekanikk ASA?

Indicative answer: *SHV Bank will have much more precise information on Norsk Presisjonsmekanikk ASA than the other bank and hence will be able to assess the risks*

more precisely. This leads to them offering a higher loan rate than an uninformed competitor would be willing to offer as they do not fully appreciate the risks. That the other bank was offering less generous terms in the past can be attributed to the mixed strategy that bank operate, it might have been that either SHV Bank offered an unusually high loan rate this time or that in the past the other bank was uncharacteristically high.
Model(s) used: Ch. 6.2

Problem 49

ComplexSolutions Ltd. is offering marketing solutions for online advertising and the engagement with influencers. It operates in a highly volatile business in which trends disappear almost as fast as they appear and where clients switch their marketing companies easily due to short-term contracts. Having recently joined this company to manage their accounts and financing of operations, you are surprised that all loans from banks are due in less than 3 months and none had an original time to maturity of more than a year. This is very different situation to your previous employer, Andrews Advertising LLP, where most loans were for multiple years. Andrews Advertising LLP is a much more traditional advertising agency where clients have long-term contracts and tend to change their agency much more reluctantly.

How can you explain the difference in the way these companies are financed?

Indicative answer: *The business of ComplexSolutions Ltd. csn be classified as a high-risk company as clients switch in and out of the company and the trends change frequently too, so getting the right clients at the right time might be difficult. This favours the use of short-term loan, even though they are more expensive; it allow the company to extract profits from time to time that then do not have to be committed to the repayment of future loans, making such short-term loans more attractive. In contrast to that, Andrews Advertising LLP is a low-risk company with steady clients in a more stable environment and the lower loan costs for long-term loans is more attractive to them as the risks from having to retain earning to serve loans in the case of future losses are low.*
Model(s) used: Ch. 6.3

Problem 50

InstaVolt GmbH is a start-up company that offers electrical back-up systems against power shortages for security systems for smaller clients. Their target market is not well developed and many analysts doubt that they will be able to generate significant business, but they are currently profitable. Seeking to expand their business, they have obtained a loan from their bank. At a board meeting the Chief Financial Officer is heavily criticised for agreeing short-term loans that have a higher loan rate than long-term loans.

How does the Chief Financial Officer justify his decision to choose short-term loans?

Indicative answer: *Although short-term loans are more expensive than long-term loans, they allow for the company to extract any surplus in a timely manner. Given that the company is profitable at the moment, it would enable the owners to withdraw these profits and the company does not have to retain them to cover any shortfalls from future time periods. This makes the use of short-term loans more attractive than long-term loans given that the risks of InstaVolt GmbH are substantial.*
Model(s) used: Ch. 6.3

Problem 51

Semen Holding PT is a large producer of cement and the leading export company in Indonesia. Although corporate governance regulations in Indonesia are not as well developed as in many other countries, their bank, Bank Daimon, has developed a good understanding of their business and the industry overall. A younger competitor Special Semen PT focuses on the development of cement for specialist applications, but has a weak market position and faces significant competition from larger companies operating in this sector. While Semen Holding PT obtains good loan conditions from Bank Daimon for their choice of long-term loans that other banks cannot match, their assessment of the risks for Spesial Semen PT makes their offer not competitive and Spesial Semem PT obtains a better offer from United Australian Bank plc, a newcomer in the Indonesian market without substantial experience in the cement industry; it chooses a short-term loan to finance its operations as these conditions are better suited to their needs.

Why does Semen Holding PT gets better loan conditions from its bank than from other banks and chooses a long-term loan, while it is the opposite for Spesial Semen PT, accepting a short-term loan from another bank?

Indicative answer: *Daimon Bank is experienced in the cement industry and thus able to assess risks precisely. This benefits the low-risk Semen Holding PT as they will be able to obtain a low low rate. Given their low risks, they choose a long-term loan that allows them from benefitting from even lower loan rates as the commitment of accumulated profits to the later repayment of the loan is unlikely to lead to losses. In contrast, Special Semen PT faces has a much weaker market position and is thus much more risky than Semen Holding PT. This will lead the well-informed Bank Daimon to offer high loan rates, which are easily undercut by the much less informed First Australia Bank, who will not assign such a high risk to this company. Given that Spesial Semem PT is highly risky, and the company knows this, it is better for them to choose a short-term loan as they then can extract any profits from the company rather than having to accumulate them for a later repayment of the long-term loan.*

Given the high risk of losing these accumulated profits, the short-term loan is more attractive to Spesial Semen Pt.
Model(s) used: Chs. 6.2, 6.3

Problem 52

Sweet Harmony Ltd. operates a chain of small sweet shops in market towns around the country. While their business has come under substantial pressure from supermarkets and online sales, they have so far managed to retain profitability by offering products that are not easily available elsewhere. To finance the renovation of some of their shops, the company seeks a loan from their bank. They have a long-lasting relationship with Finlay Bank, a small bank located near their headquarters; this bank knows the company well and has provided loans in the past and would be willing to lend them the funds required. In recent years the bank has struggled, however, and lost customers, despite offering deposit rates above the market average. They have obtained an offer for a loan at a lower loan rate from another bank, Gormeley, but this bank has been widely criticised for treating depositors unfairly by not increasing deposit rates as the central bank increased interest levels and has no discernable knowledge of the company or the retail business overall. The size of the loan Gormeley offers is not fully covering the amount required for the renovation, but Sweet Harmony Ltd. can use funds that are destined for other projects to make up the difference.

How should Sweet Harmony Ltd. approach financing the renovation?

Indicative answer: *Finlay Bank has a good knowledge of the company and hence we can reasonably assume that it will have low auditing costs of the company cannot repay its loan. On the other hand, it will have high funding costs as it offers high deposit rates. The situation at Gormeley is the opposite; they offer low deposit rates and hence face low funding costs. However, their lack of knowledge of the company and the industry in general will most likely cause any auditing costs to be high. With this scenario, it would now be most beneficial to obtain the loan from Gormeley and then supplement this with a subordinated loan from Finlay Bank, assuming that the costs of this loan does not exceed the costs of removing the funding from other projects.*
Model(s) used: Ch. 6.4

Problem 53

Malinder Bank is a specialist bank that provides loans exclusively for small and medium-sized companies in the leather industry, which dominates the region the bank operates in. Over the years it has built up expertise in this industry and has a thorough understanding of its operation. As the region the bank operates in has low levels of wealth, it has always struggled to attract sufficient deposits to finance their loans and had instead to rely on more expensive interbank loans and brokered deposits. In recent years Malinder Bank has faced competition from banks located in other, more wealthy regions that offer loans to their clients at more favourable conditions, despite having only scant knowledge of the way these companies operate. Their customers are happy to accept these loans from competitors and Malinder Bank is left to provide subordinated loans to complement the loans offered by their competitors.

How can Malinder Bank react to this competition from banks in other regions?

Indicative answer: *The banks in other regions have a competitive advantage in that the deposit rates they have to pay are lower, given the problems Malinder Bank has in funding their loans. However, Malinder Bank has a competitive advantage in that it knows the company and industry very well, which should reduce any auditing costs of failing companies. This leads to a situation where other banks provide the main loan and Malinder Bank is relegated to supplement this loan with smaller subordinated loans. Unless Malinder Bank can reduce its funding costs to become more competitive for the senior loan, it will be impossible to compete with the banks from other regions.*
Model(s) used: Ch. 6.4

Problem 54

Pierbattista Zuppi has obtained a loan to expand his business of selling high-quality leather goods by opening a second shop in a neighbouring town. He found the process exhausting as no bank seemed to be willing to provide him with a loan of the size he needed, having approached all of the major banks in the town. Being short of funds, he took the agreement in principle for a smaller loan to another bank and asked for them to top up the loan, but none was willing to do so. It was only by chance that he met a now retired colleague advising him to approach the Banca Cooperativa di Pelle, a small cooperative bank located in a town about an hour's drive away. While Pierbattista Zuppi had never heard of this bank, he applied for a loan and to his surprise was approved for the full funding he needed. The loan conditions were worse than that of the main banks and so he decides to obtain a loan from the main bank and then supplement it with a second loan from Banca Cooperativa di Pelle, to which they agreed for a supplement of 0.25% on the standard loan rate. In a personal meeting they reveal that they have to charge higher loan rates as they also pay higher deposit rates than other banks for their members. But as a bank set up to support the leather industry over 200 years ago, they have the knowledge and expertise to provide loans where most banks would refuse to approve them, even though their assessments of loan applicants are usually similar.

Why would Banca Cooperativa di Pelle be willing to provide a loan where other banks refuse, but Peirbattista Zuppi would take the largest possible loan from a main bank?

Indicative answer: *As pointed out, Banca Cooperativa di Pelle has higher funding costs than mainstream banks and would thus have to charge a higher loan rate, but this is at least partially compensated for by their expertise which should reduce any monitoring costs of the loans and also the audit costs in case Pierbattista Zuppi fails to repay his loan, giving them a competitive advantage that allows them to grant a higher loan amount. Pierbattista Zuppi will prefer a loan from the main bank as due to their lower funding costs they offer lower interest rates. It is then only the additional funding that is obtained at a higher rate, making it overall more cost effective than obtaining the full loan amount from Banca Cooperativa di Pelle.*
Model(s) used: Ch. 6.4

Problem 55

Moussa Diallo is attending the opening of a new business in the town his company, Diallo Trading Ltd., is located. Having gone through a difficult time with his company accumulating large losses due to competition from larger competitors, he shares his frustration with his bank at the reception after the speeches have completed. He complains to other business owners that his bank was not willing to reduce the amount he has to repay on his loans, despite his financial difficulties, while a neighbouring business in a similar situation has received a reduction of nearly a third on the amount they need to repay and another business he knows of has seen a reduction of a quarter. He carries on to complain that in one case the business did not even provide any collateral while he had to pledge his entire inventory and in the other case the business even was much safer than his with very little uncertainty about their future. He finishes with a sigh and the comment that his banks clearly does not like him, but prefers other businesses.

Is Moussa Diallo's assertion that his bank just dislikes him justified?

Indicative answer: *In order for a loan to be successfully renegotiated, the collateral provided must not be too valuable to the bank. In the case of the first business there was no collateral, hence the condition for a successful renegotiation of the loan could be met relatively easily, but Moussa Diallo has provided collateral that as inventory of a trading company is probably easily sold by the bank and thus sufficiently valuable for the bank to refuse a reduction of the loan amount. In the case of the second business, the low risks of the business also implies that there is limited scope for them to recover from their situation, making is rational for the bank to reduce the amount that needs to be repaid, while Moussa Diallo's company seems to have bigger risks, which also means a bigger potential for recovery. It is thus not that Moussa Diallo is disliked by banks, but that the combination of valuable collateral and reasonable chances of his company recovering has led to the bank*

refusing to reduce the debt burden.
Model(s) used: Ch. 6.5

Problem 56

Herbert Sedlmayr is the owner of Seldmayr Antiquitäten in Vienna's city centre. His business of buying antique furniture and decorations at auctions and selling them in his shop has been negatively affected by rising rents and competition from online businesses. Having usually financed the purchase of items through bank loans with the purchased items being used as collateral, he sees his future prospects negatively and believes that he will not be able to repay his loans fully. Discussing his concerns with his contact at Wiener Bank, he is offered a reduction in the outstanding loan amount of 20% to help him overcome his current difficulties. While he appreciates the move by the bank, he does not think that it will help him much in the future as he does not see a significant improvement in his business ahead. However, the bank is refusing to reduce the loans further pointing out that less than half the loans he has outstanding are covered by items purchased.

Why does Wiener Bank not offer a larger reduction in the loans to Herbert Sedlmayr?

Indicative answer: *The amount of loan reduction will depend on two factors, the level of collateral and the prospects of a recovery. It can be assumed that the provision of collateral in the form of the purchased items will have contributed to the reduction where about half of the collateral value is accounted for, assuming that the bank can sell the items at the auction price. There is no significant further increase in the loan reduction as the prospects of his business improving are bleak and hence even a further reduction would probably not help him.*
Model(s) used: Ch. 6.5

Problem 57

Special Toys Ltd. is a major importer of novelty toys from all over the world and distributes these to many independent shops around the country. It commonly finances the import of their toys through a bank loan secured on the value of this shipment from the time of shipment to its final sale, a time period of many months; other operating costs are financed through unsecured loans with a different bank. Each of the loans are of approximately equal amounts. With the ever more widespread use of online markets, their business has suffered losses in recent years and they seek a relieve of about half their debts to return to profitability and make necessary investments into their distribution system. The banks generally agree that the future of the business is anything but certain, although not without a chance of survival.

Will both banks likely agree to write off their loans to allow the company investments into their distribution network?

Indicative answer: *It is unlikely that the bank financing the import of toys will be agreeing to such a move. They are holding collateral and will thus face only a small loss in case the bank will fail. It is thus only likely that the bank having provided unsecured loans will agree to a write off of some of the loans, assuming that the chances of the company recovering in the future are sufficiently high to secure the repayment of the lower loan amount, but not as good as to ensure the repayment of the full loan amount. With one bank unlikely to write off their loan and the other bank willing to write off parts of their loan, the total write-off will not be sufficient for the company to make the necessary investments.*
Model(s) used: Ch. 6.5

Problem 58

Fandresena Rakoto is negotiating a loan for Hermel Ltd, a company building small machines for the building trade, such as cement mixers or pneumatic drills. Discussing the terms the bank offers her, she bemoans the high interest rate of 6.7% the bank demands, which she finds high compared to what she previously had arranged with another bank. In their response, the bank replies that she cannot compare the loans only on their loan rate, but needs to take the wider conditions into account; for example the current loan offer allows the Hermel Ltd. to repay the loan early for a small additional fee, giving the company flexibility. Unimpressed by these interventions, Fandresena Rakoto remarks that it is of little value to her as the investment for which the loan is will be for machinery that will last pretty much as long as the maturity of the loan she has applied for, repaying the loan early is for that reason not a meaningful option, especially as there is an additional fee to be paid.

Is Fandresena Rakoto right to dismiss the value of being able to repay the loan early?

Indicative answer: *While Hermel Ltd. might not be able to repay the loan directly, they might be able to obtain a loan for better conditions at a future point, for example if the loan rates fall. In this case they could repay the current the current loan through taking up a new loan at lower loan rates. It is this option that may let look the current loan rate look more expensive than another loan that does not allow for this option. Thus Fandresena Rakoto needs to consider the value of this early loan redemption when comparing the loan rates of this loan and that of a competitor bank, including the early redemption fee.*
Model(s) used: Ch. 6.6

Problem 59

Century Publishing Ltd. is currently not profitable after overpaying for the translation rights of a few authors that were not popular with readers. The management is, however, convinced that the latest acquisition, which is nearing completion, will sell well and make the company highly profitable again. In order to finance the acquisition of the rights to this book and the expected large print run, Century Publishing Ltd. seeks a loan from its bank. They offer them a loan with a loan rate of 7.2% p.a. for a time of two years, which covers the time until they will receive payment from distributors for the published book. As a long-standing customer, the bank offers them the option to repay the loan after one year if the book sells that well that they are able to do so. Even though Century Publishing Ltd. have received an offer for a loan at an interest rate of 6.8% p.a. at another bank, without the possibility to repay the loan early, they accept the offer of 7.2% p.a. of their bank. Century Publishing Ltd. does not expect the book to sell that good that they will be able to repay their loan after one year.

Why do they nevertheless accept the offer of their bank?

Indicative answer: *While Century Publishing Ltd. might not have the funds to repay the loan after one year, they might be able to obtain a new loan for the remaining year at a better loan rate. In particular, as they are currently not a good financial position as they are not profitable and the risks from the new book will substantial, they will attract a high loan rate. If the book sells well, their position will have changed and they should be able to obtain a loan at a much lower interest rate, while no increase in the interest rate can occur if the book does not sell well and the risks of the company do not reduce. It is this possibility that makes the offer of their bank attractive, despite having a higher interest rate.*
Model(s) used: Ch. 6.6

Problem 60

Camille Saint-Marc has handed in his notice as a management consultant to set up his own company. At his leaving party, his former manager tells him 'Always take out long-term loans, they are cheaper and if you run into difficulties, it is easier to negotiate with banks. With short-term loans they are much more difficult.'

Is this sound advice?

Indicative answer: *Long-term loans might be looking cheaper as the total interest paid is lower than for short-term loans. However, long-term loans are not necessarily cheaper overall as such long-term loans typically limit the ability of the company to pay out realised profits, loan conditions of require them to be at least partially retained within the company; this will increase the amount that the bank obtains if the company fails at a later point, increasing the costs to the company owner. It is generally only cheaper to obtain long-term loans if the risk of failure are sufficiently*

low, thus only companies with low risks will find long-term loans genuinely cheaper. The ability to renegotiate long-term loans more easily can be justified to some degree. The amount a bank is willing to reduce the loan amount by is increasing in the risks of the company and the longer the time to maturity of the loan, the higher the risk given the long time period to be covered. However, the willingness to make such reductions is limited the higher the risks, thus for longer maturities as the possibility of a recovery is higher, too. It is thus that renegotiations of the loan amount in times of the company being in financial difficulties are less likely to be successful, but if they, are the reduction offered will be higher. These potential benefits over short-term loans need to be balanced against the costs of long-term loans for high-risk companies. It is therefore not advice that is universally appropriate, especially for a new company, which usually has high risk.
Model(s) used: Chs. 6.3, 6.5

Problem 61

'Of course, companies with better investments are monitored less by banks because there are fewer risks to banks, so there is no point in wasting time and effort.'

Is this assertion correct?

Indicative answer: *Companies that generate high returns are not monitored less because of the lower risks they pose to banks, but instead this is the result of an incentive that employees in banks conducting this monitoring have. Companies with better investments, that is those that can generate more profits, have more funds available to share with managers to not enforce diligent investment. It is this possibility that managers supposed to monitor companies receive private benefits from not monitoring the behaviour of companies appropriately. This ability of the company to increase such payments reduces the incentives for employees to monitor as their failure to do so will still see them receive payments from the company, even though no bonus is paid by the bank due to their failure to monitor properly. To prevent this occurring, the bank has to increase the bonus payments of the employee, but as this affects their profits, fails to increase it to maintain the same level of monitoring as for less profitable companies. It is thus not the lower risk banks are exposed to that leads to the reduction of monitoring, but the incentives of employees to not monitor as effectively due to benefits they can obtain when not monitoring.*
Model(s) used: Ch. 6.7

Problem 62

In recent years, Lamarck Bank has grown considerably as the town they are operating in has opened a business park and attracted a number of new companies. The head of corporate loans, Julian Lamarck, who is also the deputy chairman of the board, has so far overseen personally all larger loans the bank has provided. He had regular meetings with the management of these companies and discussed their investment plans and general business progress to safeguard the loans of the bank. With the expansion of the loan portfolio, this is no longer possible and he has decided to delegate this task to employees and he himself will focus on the acquisition of new customers. He is worried that with the delegating the monitoring of existing borrowers to employees, the level of monitoring will decrease, even if he pays his employees well. He sees this as a particular concern as many of the companies seeking loans are newly founded and benefit from guidance for their future development and avoid the pitfall of many new companies that any funds are seen by the founders as an opportunity to indulge in their private passions.

Are the concerns of Julian Lamarck justified?

Indicative answer: *Provided that appropriate measures are taken in the remuneration of the employees conducting the monitoring, the monitoring effort will actually increase. Paying the employee a bonus for any loan that is repaid will ensure that a high effort is made to monitor companies as only then will the employee receive this additional payment. If the companies are new and therefore risky, he will have to offer significant bonuses given the inherent risks of the businesses. It will thus require a significant expense on part of the bank to ensure that the companies are investing diligently.*
Model(s) used: Ch. 6.7

Problem 63

Georg Malewitch is a venture capitalist investing into small promising companies in the technology sector. Many company founders have no business experience and need substantial help on how to manage their company, but also on how develop sound financial and investment policies. Once the companies have grown, they are taking on bank loans and he always advises them to take loans from at least two different banks. In his advice to companies he stresses that when selecting banks carefully, this increases the amount of loans they can get to grow more quickly. What he does not tell them is that this also relieves him of much of his role to advise and monitor the companies.

Why would using multiple banks benefit the companies and the venture capitalist more than using a single bank?

Indicative answer: *Using different banks has the advantage that the company can make use of different comparative advantages of banks, which will increase the overall loan amount. Choosing a bank with low funding costs will allow loans to be granted at low costs, but given the risks this imposes on banks for assessing and monitoring these companies with whose business they are potentially not familiar with, limiting the amount of lending they are willing to do. Selecting another bank*

which is more familiar with their type of business and thus faces lower costs in monitoring them, may be able to advance another loan, even if they face higher funding costs. The added benefit is that both banks will monitor the company to ensure their loans are repaid. This will increase the overall level of monitoring, especially of companies in a situation where they are not yet performing well and the ability to misuse funds out of ignorance or a wrong understanding of how businesses are to be run will be substantial. Given that technology companies are difficult to understand and new companies in general are based very much on business ideas that are not full developed, any such monitoring will be difficult and time consuming; thus having multiple banks sharing the monitoring effort would actually increase the overall monitoring quality, despite some moral hazard between the two monitoring banks relying on each other to monitor. These efforts by banks benefits Georg Malewitch as it allows him to reduce his monitoring efforts and it leads to a faster growth of the companies.
Model(s) used: Chs. 3.2.2, 6.4, 6.7

Problem 64

The restaurant Fisk och Krydda, combining local fish dishes with oriental influences, is a well established institution in Malmö where a table needs to be booked weeks or months in advance. To expand the number of tables they can serve, they have rented the premises next to theirs and seek a loan to finance its renovation, the expanded and modernised kitchen facilities to cater for the larger number of guests that will be needed shortly afterwards, as well as the modernisation of the existing facilities, which are expected to be commenced in approximately two years. Their bank is more than willing to provide the loan and offer a loan rate of 4.7% p.a. over a time period of three years, to cover not only the expansion but also the needed enlargement and modernisation of the kitchen. As common with restaurateurs, after closing the owners of local restaurants often sit together for a chat and exchange information while their employees clean and tidy up the premises, getting them ready for the next day. The owner of a small restaurant opposite, Hemlagad, who has been struggling to break even in most years but had times in which his restaurant trended due to the visit of some influencers, remarks that he would not sign on for such a long time. He would only be willing to take out loans separately for each of the works. If banks were insisting on such a long-term loan, he would insist on being able to repay the loans after each work is completed, even if he has to pay more. The owner of Fisk och Krydda observes that he was never offered the option to repay his loan early, not that he would consider it.

Why do the two restaurateurs take such different approaches to financing their companies?

Indicative answer: *We first have to note that the two restaurants are in very different circumstances, Fisk och Krydda is performing very well with a long waiting list to*

reserve a table, it will therefore be a low-risk company. In contrast to that, Hemlagad will be much more risky, with the occasional good time period, but generally a much lower performance. It is therefore that Fisk och Krydda is preferring the lower interest rates enjoyed on long-term loans, while Hemlagad is willing to pay a higher loan rate, but has the ability to withdraw profits if they are realised. It is also that if Hemlagad was required to take a long-term loan, it may want to repay it early in case the restaurant enters one of the time periods in which it is profitable and subsequently can obtain a lower interest rate due to the lower risk. This is not attractive to Fisk och Krydda as the restaurant is performing consistently well, hence there will be no benefits for such an option to repay the loan early as any new loan would be on the same conditions, making any additional costs unattractive. The fact that Fisk och Krydda was not offered such a loan at all suggests that it is not feasible for bank to offer this contract; the small difference, if any, between the restaurant performing well and not so well will be minimal, making the bank offering an early repayment of loans with an early redemption fee unsustainable as no such fee could be agreed on in these circumstances.
Model(s) used: Chs. 6.3, 6.6

Problem 65

Miklós Orosz has experienced that two of the companies whose loan officer he is, have claimed to be unable to repay their loans. While it surprised him that these companies were supposed to be failing, it certainly fitted into the wider picture of an overall struggling economy and an increasing default rate of companies across the board. Giving these two companies more scrutiny, he found that their supposed inability to repay the loan was engineered by the company owners through the use of sister companies and the payment of excessive salary to the owner-managers. Talking to colleagues, they report the same phenomenon, namely that since the economy started to perform poorly, they were seeing a noticeable increase in such wrong claims of bankruptcy. Despite increasing the time each loan officer spends on investigating each claim, and them making it clear to customers in informal discussions, the number of false claims remains higher than previously and he does not have the capcity to give every case sufficient scrutiny. Over lunch the loan officers agree that the level of dishonesty is ever increasing and this is just a sign of the immoral times they are living in. However, Miklós Orosz disagrees and says it is the same every time the economy performs poorly.

Is Miklós Orosz correct in his assertion that such claims for default always increase in times of poor economic performance?

Indicative answer: *If the economy is not performing well the actual defaults by companies will increase, as evidenced here by a generally increasing default rate. This increasing default rate allows other companies to hide their strategic default better as loan officers will have to investigate more genuine cases and despite*

allocating more time to these audits, this is not sufficient to cover all cases, thus opening up the possibility of a strategic default going undetected. It is therefore that companies take advantage of the increased workload of loan officers auditing the companies defaulting as the increase in time they spend on such audits is not sufficient to retain the same level of scrutiny they could give each case in times with lower genuine default rates.
Model(s) used: Ch. 7.1

Problem 66

Nikola Aleksov owns a joinery and having been able to withstand a time of low order books during a recent deep recession due to a number of bank loans that allowed him to keep paying employees and paying leasing rates on machinery, he now suffers from the burden of high repayments that severely affect his profits while the business and the economy in general are experiencing a recovery. He sets up a new company in another part of his workshop and redirects any inquiries for work he receives to this new company, which has also taken over some of his machines at an advantageous price and some employees have also been given new contracts with his new company. After a while, he declares to his bank that he is not able to service their loans anymore. His bank's reaction was not as he expected, instead of writing off the loan on seeing that his company had clearly not recovered, they made further extensive enquiries and discovered how he had channeled all customer queries to his new company. They refuse to write off the loan and insist on him repaying it from the profits of his new companies, threatening legal action against him if he fails to do so. Very surprised by this move of the bank, Miklós Orosz discusses the situation with other joiners who previously had employed the same mechanism successfully. Adam Miesoczki remarks that he is too late to the game, he should have taken the loans and then during the recession declared bankruptcy, not now that the economy is performing better.

Is Adam Miesoczki right in his assertion that Nikola Aleksov has left it too late to play this trick on banks?

Indicative answer: *During a recession many companies will genuinely default and this will make it difficult for banks to follow up all companies that default on their loans, even with more resources committed to it; this would have made it easier to escape detection of this strategic default. Now that the economy is performing better, the genuine defaults will be much lower, making it easier for banks to give each case more scrutiny as there are less cases to investigate, even though they will have scaled back their resources. It is therefore more likely that companies seeking a strategic default are detected by their bank.*
Model(s) used: Ch. 7.1

Problem 67

Polarnos is a developing country that has invested significantly in its infrastructure by obtaining bonds from international investors. Having accumulated over 120% of GDP on such bonds, they now face significant costs of servicing these bonds and making any repayments. The government is concerned that the costs of servicing this debt will divert resources from further investments into the development of their economy. Seeing that with the infrastructure for their development now in place and tax income steadily increasing as the economy grows, the government discusses the possibility of simply defaulting on their bonds.

Having asked the central bank to provide advice, what would this advice look like?

Indicative answer: *The benefits of defaulting on the bonds is immediately clear in that no payments need to be made to international investors and the funds can instead be invested into the development of the domestic economy, generating further growth. The costs of this move is that Polarnos is likely to be frozen out of the bond market for a considerable period of time. This would not allow them to borrow any funds for their development if domestic funds prove to be insufficient or a loan would be required to pursue started projects in case of an unexpected shortage of funds, for example due to a recession. The government will need to balance these potential costs, weighted by their probability of occurring against the benefits of not repaying the bonds.*
Model(s) used: Ch. 7.2

Problem 68

Magnus Oil Corporation plc is a major oil producer in the Chagassian Sea using a number of platforms to exploit extensive oilfields. Their company is set up such that each oilfield is operated by and licensed to its own limited company of which Magnus Oil Corporation plc is the ultimate owner. In August last year the oil platform exploiting oil field 27 caught fire and while no serious injuries occurred, the oil platform itself was destroyed and substantial amounts of oil spilled into the sea, causing widespread pollution. The cost of repairing the incurred environmental damage is estimated at 7-10bn US$. With only an expected 3-4bn US$, Magnus Oil Corporation plc decides to not address the environmental damage, even though the company as a whole could easily afford the costs; however the limited company operating oil field 27 has only 500mn US$ available.

Is the decision of not rectifying the pollution sensible from Magnus Oil Corporation plc's perspective?

Indicative answer: *The loss from bankruptcy to the limited company operating oilfield 27 would be the existing resources of 500mn US$ and the oil left in the oilfield, a worst case scenario of 4bn US$. This is significantly less than the costs of addressing*

the environmental damage of at least 7bn US$. From this perspective, losses to Magnus Oil Corporation plc when allowing their subsidiary to file for bankruptcy would at least 2.5bn US$, making this decision obvious. However, other costs might need to be considered, such as the loss in confidence that Magnus Oil Corporation plc will provide adequate funds for subsidiaries in distress, increasing their finance costs, and it might also reflect on Magnus Oil Corporation plc itself in that their commitment to lenders might be questioned. Further, given their decision to not address the environmental damage, it might be that future licences and concessions are not granted to subsidiaries of Magnus Oil Corporation plc, causing losses of future income. Their reputation might also be damaged with consumer groups, leading to reduced sales of their products. The likely impact of such secondary costs need to be considered as well and only if all these costs are lower then the additional funds required, is it advisable to allow the subsidiary to file fr bankruptcy and not address the pollution caused.
Model(s) used: Ch. 7.2

Problem 69

Alinafe Maseko operates a small tea shop at a popular tourist destination, generating a steady stream of revenue, turning a small profit over the summer months. In response to a series of wildfires in the area her tea shop had to remain closed for most of the summer and even after the area was deemed safe again for tourists to visit, very few visited due to the negative news coverage in the months before. Consequently Alinafe Maseko could not maintain payments on the loan for a new coffee automat and a refurbished shop, filing for bankruptcy. Through personal contacts she has been able to secure the rent on a new tea shop in a different location, but with similar characteristics. The new shop is in need of renovation and modernisation, but her bank declares that they would not be willing to lend to her during the next two or three years due to her previous bankruptcy. Her friend, Orla Coury is surprised that the bank would consider lending to her that soon. In her experience it took her six years to be accepted again for a loan after failing with her business of selling hand-made decorations online. She accepts that it was a different type of business with her profits very much depending on spotting the latest trends before any of the major retailers did. Alinafe Maseko thinks that she might have been lucky by using a bank that is more forgiving.

Is Alinafe Maseko correct to assign the shorter time period until she eligible again for a loan to her bank's more lenient policy?

Indicative answer: *The tea shop of Alinafe Maseko generated a steady and reliable income stream, suggesting that the business was low-risk. This gives her little incentives to default strategically as she would forego that steady stream of income, hence she would only be excluded for a short period of time from borrowing. In contrast, Orla Coury's business was much more risky and she would have stronger incentives*

for a strategic default due to the unpredictability of her business, necessitating a longer period during which she cannot borrow. It is thus not luck or policies between banks that differ, but the difference is driven by the nature of their respective businesses, namely the riskiness of them.
Model(s) used: Ch. 7.3

Problem 70

Kevin Maguire owned a car repair shop employing five mechanics. Having had financial difficulties, despite taking on considerable loans to modernise his equipment, in recent years due to car owners only conducting essential repairs to reduce their costs, he has reduced his costs as much as he could, including not renewing his fire insurance. Unfortunately for him, a fire in a neighbouring factory spread and engulfed his repair shop which was completely destroyed. Having no fire insurance, he did not receive any payments and declared bankruptcy. Undeterred by this misfortune, he sees this as a chance and approaches his bank to rebuild the repair shop, but focussing on electrical bicycles and later electrical cars instead, initially without any employees. He seeks an initial loan of £250,000 to rebuild the burned down repair shop and purchase essential equipment. His loan application is turned down and the reason given is that as he just has declared bankruptcy, the bank will not consider him for a loan until at least 6 years have passed. He believes that this reason is not genuine, but the bank has turned down his application as they do not believe in his new business idea.

Why is Kevin Maguire's assessment of the bank's reasons wrong?

Indicative answer: *Focussing purely on the reason for requiring a longer time until a loan can be granted again, his bankruptcy may or may not have been a strategic default. He may have let the fire insurance lapse and hope for damage that would allow him to default on his commitments; a waiting time is enacted to counter any incentives for such behaviour. That the waiting time is as long as indicated by his bank can be attributed to the riskyness of his existing business, but also most likely his proposed new business. With high-risk and low-return companies, the small future profits are an incentive to strategically default as the instant benefits of doing so may well outweigh the future income. It is therefore that the exclusion period is set relatively long.*
Model(s) used: Ch. 7.3

Problem 71

As a credit risk manager at Atrius Bank you are monitoring the default rates of the loans the bank has provided. Accounting for various characteristics of companies, you notice that in the recent downturn the fraction of loans not repaid did increase to 1.6%, while during the previous time of economic expansion this fraction was only 0.5%. While you expect that the default would increase during a recession, you are surprised by the large increase. Based on the risk assessment at the time the loan was granted and adjusting for various factor affecting the default rate, you would have expected a default rate of 0.35% during the expansion and 1.15% during the recession. While the actual default rates are all higher, and this difference being statistically significant, you are particularly surprised about the high increase during the recession. Assessing your model, you cannot find any factors you have not considered adequately. Your colleague, in passing, says that he is surprised the discrepancies are not more cyclical.

Is there an explanation for the discrepancies between the actual and predicted default rates and why does your colleague think the cyclicality of this discrepancy should be higher?

Indicative answer: *The explanation for the discrepancy is in the rate of strategic defaults. If we assume that the model is making correct predictions for companies being actually in distress, then the difference represents the strategic defaults. At times of economic expansions strategic defaults are less common than during recessions. To explain this there are two effects that need to be considered. Firstly, during economic booms actual defaults are rare, allowing banks to frequently audit companies that are defaulting and thereby identifying many attempts and relatively few such attempts will be successful, giving rise to a low rate of strategic default. In contrast to that, during a recessions many more companies default and even if putting more resources into auditing defaulting companies, there will be more such companies that are not identified as strategically defaulting. This is reflected in the numbers observed. But there is a second effect that counters this cyclicality of strategic defaults; while during an expansion of the economy most companies will be performing well, their outlook for the future are less positive as they will have a reduced performance once the economy enter into a recession. This less positive outlook gives incentives to strategically default. During the recession the future outlook is more positive with an expansion of the economy expected soon and thus the prospects of companies increasing, reducing the incentives for strategic defaults. It is therefore that this second effect counters the first, reducing the change in discrepancies.*
Model(s) used: Chs. 7.1, 7.2

Problem 72

Voltera GmbH is a leading German manufacturer of electrical equipment used in a wide variety of industrial machinery. New markets have opened after the collapse of one of its main competitors and they seek to expand their business. Voltera GmbH has no meaningful experiences in the markets they seek to expand into, being both geographically different to their current main market and the type of machinery which uses their equipment is also different. While they can use some of their own resources to expand their business, they will have to rely on a loan for a substantial part of the investment. Approaching their bank, they have commenced discussion about a loan which is significantly larger than what they required thus far. During the discussion with their loan officer, they had the impression that their bank would support their investment plans. It comes therefore as a complete surprise that the loan offer obtained from the bank will only allow Voltera GmbH to finance some of the expansion. Subsequent negotiations lead to a slight increase in the loan amount offered, but it falls well short of the amount required for their initial plans. Their bank makes it clear that the it is not a question of increasing the loan rate as profits from the interest is not the driver behind this decision.

How can you explain that Voltera GmbH is not offered the full loan amount?

Indicative answer: *Voltera GmbH expands into markets they have limited experience in and will therefore be exposed to higher risk than they were in the past. Such risks put into question the ability of the company to repay loans, leading to credit rationing. The bank will want to ensure that the loan is repaid and will therefore not accept a too high leverage of the company. Increasing the interest would increase the amount that is due to be repaid, but this amount is irrelevant if the loan cannot be repaid in full, hence offering a higher loan rate would not induce the bank to grant a larger loan. Even though the bank is willing to support the investment, it will feel that the amount to be repaid must not be too high relative to the investment made to ensure repayment of the loan, thus requiring sufficient equity or other funding sources, to be provided by the company. Of course, any such funding sources must have a lower seniority than the bank loan.*
Model(s) used: Ch. 8.1

Problem 73

Contra plc provides material for the building industry for many years. One of their main customers is BYH Ltd., the country's largest provider of prefabricated homes. BYH Ltd. has been loss-making for a long period of time while demand for standardised houses was subdued and individually designed and built houses were much more popular, despite the higher costs. Seeking to avert bankruptcy, it has been reported in the local newspaper that the current owner has approached Contra plc to explore whether they are interested in buying BYH Ltd. Rumours have it that Contra plc is interested in such a purchase, but no formal offer has been made. At the same time, Contra plc has also planned to modernise their existing business by updating their production facilities to comply with upcoming environmental regulations. Given the financial situation of Contra plc, it is obvious that they could not conduct the modernisation and the purchase of BYH Ltd. at the same time. Contra plc. has been in negotiation with their bank on financing the modernisation of their business, but since the reports about them being interested in buying BYH Ltd. have been published, their bank has repeatedly cancelled meetings to finalise the loan and suggested that a smaller loan of approximately half the size would be sufficient to finance the first phase of a modernisation and that once this is completed, an additional loan might be sought.

How can you explain this behaviour of the bank?

Indicative answer: *This is a case akin to credit rationing. The bank seeks to prevent Contra plc from purchasing BYH Ltd. by not advancing the loan negotiations, making the purchase impossible, as well as offering a phased loan such that the purchase price for BYH Ltd. is not available. It is likely that the bank sees the purchase of BHY Ltd. as a high risk, given they are close to failing and operating in a market that shows no sign of recovery. The bank thus tries to either not give Contra plc a loan at all or a loan of a size that would not allow them to purchase BHY Ltd. The modernisation of the business can be viewed as a safe investment, which the bank would be willing to finance, but it seeks to prevent the company using the loan given for this purpose to be used for the investment into the much more risky BHY Ltd.*
Model(s) used: Ch. 8.2

Problem 74

CallServices Ltd. is a long-established provider of call centers and has contracts with many retailers in the fashion industry to provide services to callers inquiring about their products, dealing with complaints, as well as managing returns and replacements. They are well known for their high level of satisfaction with customers due to employing knowledgable phone operators. The more recent trend to replace phone conversations with online chats has been less successful for the company and customer satisfaction has become a concern. In order to overcome this problem in dealing with customers, CallServices Ltd. has developed a plan to make more use of artificial intelligence and use chat robots more widely. They have observed that other companies which have pioneered this technology have suffered significant loss in customer satisfaction and have lost very profitable contracts as a consequence. CallServices Ltd. is convinced, however, that using the expertise of their call center staff they can develop a system that exceeds the performance of their call centers. Approaching banks about financing their investment in developing the requisite software, CallServices Ltd. get offered loans that fall short of their requirements. The loans offered would allow them to invest into the training of their existing staff and expanding their offering in the more traditional call center services, but developing the artificial intelligence would not be possible with the loans offered.

Why do banks only offer loans that are insufficient to make the investment into the new technology?

Indicative answer: *Banks will view the risks of the new technology as being high, probably too high and will not support their investment. Instead they seek to steer the company towards the more established line of business they are currently successful*

in and which can be seen as low-risk. As they will not be able to direct the company how to conduct their investment, they offer loans that are too small to make the new technology viable. Such credit rationing ensures CallServices Ltd. maintain low risks.
Model(s) used: Ch. 8.2

Problem 75

During a meeting with fellow Chief Financial Officers at a conference, Pauline Harris shares a recent encounter with one of the banks her company uses. She reports that her company enquired about a loan for $100m and was quoted a preliminary loan rate of 10.75% p.a., which she complained was rather high. In response to her complaining about a rather high loan rate, the loan officer at her bank told her that he could offer her a loan of $150m for 10.25%. Pauline Harris looks at the people she is talking to and sees their puzzled faces. She continues by saying that she looked equally confused, but that it was luckily a phone conversation, so her surprise was not seen by the loan officer. Pauline remarks that somehow banks have gone crazy if they offer a larger loan at lower rates.

Is there an explanation for the offer of the bank?

Indicative answer: *It must clearly be optimal for the bank to charge a lower loan for a larger loan, despite the higher risk of non-repayment due to the higher leverage of the company. The bank is concerned about the expected repayment of the loan, including interest. A larger loan is less likely to be repaid in full as the outcome of the investment is less likely to cover the required repayment. The same expected repayment of a loan can now be obtained if the bank provides a larger loan at a lower loan rate. The lower loan rate will reduce the total repayments required; if the bank were to increase the loan amount, this would then lead to the same repayment requirements. Hence banks make the same profits from a smaller loan with high loan rates and a larger loan with lower loan rates.*
Model(s) used: Ch. 8.1

Problem 76

Bank of Hampton operates a lucrative business in providing student loans on a commercial basis. They consider all students enrolled at Hampton University for a loan that would cover their tuition fees and reasonable living expenses for the duration of their degree. Such loans are then repaid with interest after graduation over either 15 or 25 years. Students are interviewed when applying for such a loan and based on the interview, together with their university application and other supporting documents, an offer of a loan may then be made. Generally students are offered a loan without having to provide any guarantees by parents, but some students and their parents choose to do so and are offered the same loan, although at a lower loan rate. Based on the information the bank has, there is no difference in the risk assessment between students that provide a guarantee through their parents or other relatives and those which do not. However, repayment rates of those providing guarantees are significantly higher. The bank attributes this observation to the higher effort students put in after graduation to avoid having to get their parents involved in the repayment of their student loan.

Is there an alternative explanation?

Indicative answer: *Students and their relatives will know better the risks of repaying the loan, for example the desired career in well-paid jobs or in jobs that are less well paid or face higher unemployment. It will be difficult for banks to distinguish between students on that basis as it is not difficult to pretend to seek well-paid employment only to obtain the loan in the first place. It is now that students who are certain that they will be able to repay their loan out of their own employment, may want to obtain a guarantee from relatives to reduce the loan rate and hence the repayments necessary. The risk of relatives having to make payments will very small for such students and hence the lower loan rate will be beneficial. For students seeking less well-paying employment, the ability to repay the loan will be lower and a guarantee by relatives would be more likely be called upon. This makes the provision of a guarantee less profitable, despite the savings due to the lower loan rate. Hence we can interpret guarantees as a collateral.*
Model(s) used: Ch. 9.2.1

Problem 77

Alois Schicklhofer has set up many shops in Linz over the years, all tried new and untested concepts or products with a thus far limited market appeal. While some of these shops were successful and he sold them once established, usually to larger chains, many were not successful and they ended with his bankruptcy. Despite this mixed track record, he has been able to secure loans to set up a new shop in many cases, although always needed to let some time pass, 'to calm the banks' nerves', as he calls it. Meeting with Alois Schicklhofer at a shop opening, Hermann Hermann, having just started his graduate training programme at Austria Bank, predicts that the time he has to wait to obtain a new loan will be longer if he fails during a recession compared to times of economic expansion. To Hermann Hermann's surprise, Alois Schicklhofer says that he has not noticed any difference.

How can you explain this experience of Alois Schicklhofer?

Indicative answer: *The time a borrower is excluded from borrowing after a default should be higher if the risks of the company are higher, and the risks are typically higher during a recession than during an economic expansion. This is to reduce the incentives for strategic default as with higher risks the future benefits from*

making loan payments are are usually lower, and the longer exclusion period makes a strategic default more costly. This would reflect Hermann Hermann's assertion. However, during a recession the future prospects of the company are usually better than their current situation, while during an economic expansion the future prospects are usually more negative due to the expected future recession. This suggests that the incentives for strategic default in a recession are lower than in an economic boom, counteracting the first effect; therefore the increase in the time during a recession until a new loan will be granted would reduce. The experience of Alois Schicklhofer suggests that these two effects are approximately equally strong, and cancelling each other out.
Model(s) used: Chs. 7.2, 7.3

Problem 78

The annual banquet of the Association of Bankers is always well attended by dignitaries and selected business men. As is custom, the mayor delivered a speech standing at the front of the banquet hall in full regalia signifying his office, praising the contribution the banks have made to the businesses in the city and how this had positive effects on the community. The main purpose of businessmen attending the banquet, apart from the food, are the networking opportunities that emerge during and after the dinner. Harvey Simpson is a local entrepreneur who has recently expanded his facilities in town and created additional employment opportunities. However, he was not intending to make this expansion and sought originally to invest into research to develop new manufacturing methods in the glass industry, for which he currently provides machinery. He laments to the Mayor, who could not escape his clutch, that banks refused to provide him with a loan for this innovative project, instead of the £10m this would have required, they only granted £5m, knowing well that he could not afford the contribute the shortfall and commencing the research with only half the funds needed would not be profitable for him. He then had to settle for second best and expand his business. Closing his complaint to the mayor he mentions that the bankers had told him that had he needed £20m for his research they might have approved it, and he was sure they were joking. The mayor being forced into replying says that unfortunately banks will not provide too large loans in some instances as they deem the risks too high and therefore cut down the amount they are able to offer.

Does the mayor's response explain the situation Harvey Simpson has found himself in?

Indicative answer: *The situation Harvey Simpson has experience is one of credit rationing. The mayor explains this with the risk of the research project being too high and therefore they reduce the loan amount to reduce their risk exposure. This explanation does not fully align with the experience Harvey Weinstein had. Firstly, he had a choice between two possible investments, one being risky - the research project - and the other being less risky - the expansion, rather than a single project*

which due to the bank's decision was reduced in scale. In addition, he was told that an even larger loan would have been approved, which would not happen if the aim of the banks was primarily to reduce risks. Instead, it suggests that the banks saw the research project as a risky investment and wanted to steer him towards the more safe expansion of his business. A larger loan, with the associated returns to the company would have made the risky project sufficiently profitable for banks, but this was not feasible for Harvey Simpson.
Model(s) used: Chs. 8.1, 8.2

Problem 79

Nonna SpA manufactures components to be used in engines of different kinds. With their business being very cyclical, they seek to use the currently emerging recession to modernise their machinery and put themselves into a strong position once the economic conditions improve. The rationale is that in the current climate not many companies are investing, so the machines to be bought should be available at a discount and once the economy improves they would have all new machines in place to take advantage of the rising demand. Nonna SpA operates in a competitive market, where in particular manufacturers in the Far East put pressure on profits margins and market share, having made banks more cautious in their credit assessment, but loans have usually been granted by their banks. When negotiating with their bank, they made it clear to the CEO Gasparo Nonna that a loan would be approved, but it quickly transpired that rather than the amount sought, €25m, the bank would only provide €15m, which would mean that not all parts of their business could be modernised. Gasparo Nonna cannot convince his bank to increase the loan amount, even when offering to pay a higher loan rate.

How can the problems of Nonna SpA obtaining the full loan amount be explained?

Indicative answer: *Nonna SpA experience credit rationing, but this credit rationing is not induced by a high loan demand and high risk as the modernisation of the business can be seen as relatively low risk. There is also no evidence that the company might pursue a more risky strategy and the bank limits the loan amount in order yo induce Nanna SpA to choose the low-risk investment. The credit rationing here is driven by the possibility of strategic default. The bank does not want to hand the company too many resources as that would make it attractive to strategically default by not repaying the loan, even though this was possible. Evidence for this to be a potential problem is the timing of the loan request: the prospects for the company in the nearer future are not good given the beginning recession and the business being very cyclical. This can be combined with the risks that is inherent to companies during a recession, which might further provide incentives to strategically default.*
Model(s) used: Ch. 8.3

Problem 80

Wertmann GmbH and Hoffmann & Lange KG are companies occupying adjacent properties in an industrial estate and the owners of both companies are not only friends for a long time, but Horst Wertmann's daughter is engaged with Lars Lange's son. Although both companies are located next to each other, their businesses could not be more different. Wertmann GmbH develops software for research divisions in companies working to predict consumer behaviour. Their business depends very much on their latest ideas and how well they work, in addition to the uncertainties about what type of tools are currently in demand. Hoffmann & Lange KG, on the other hand, is a producer of specialist chemical products for which he has long-term contracts, providing the company with a steady and predictable market. Both approach their respective banks for a loan, in Hoffmann & Lange KG's case for a replacement of their ageing laboratories used in quality control and for Wertmann GmbH to upgrade their computers to the latest specification. The loan for Hoffmann & Lange KG is approved without much delay, while that of Wertmann KG is finally approved, but instead of the requested €2m, only €1.25m are offered. After this decision, Horst Wertmann laments that banks are really biased against technology companies, while traditional brick-and-mortar companies are looked at much more favourably.

Is the reason for the different decisions that banks are preferring one industry over another?

Indicative answer: *The differences in the loan decisions have their origins in the types of the two companies, but this is not about the respective industries they represent, but the risks. Hoffmann & Lange KG is a low-risk company due to their long-term contracts and hence there is very little incentive for the company to strategically default. However, Wertmann GmbH operates in a very volatile markets and faces much higher risks. This higher risk makes it potentially more attractive to strategically default. In order to reduce the risk of strategic default, the bank limits the loan amount as this firstly reduces the benefits of strategic default as the amount not repaid will be lower and secondly it also limits the resources within the company that could be retained.*
Model(s) used: Ch. 8.3

Problem 81

Stavros Optiki EPE manufactures high-quality lenses for use in microscopes and high-end personal telescopes. The company has suffered from the improvement of lenses produced in countries with lower labour costs and for now manages to remain in the market thanks to their ability to meet specific demands by manufacturers of the end product in a very timely manner. In order to retain their three largest clients, Stavros Optiki EPE needs to invest into new machines that allow them to produce a wider range of lenses without having to dismantle parts of the machines that shape the lenses. In order to meet the anticipated demand, he seeks to purchase two machines from Japan at a cost of ¥250m each. The bank is supportive of this investment, but he is only approved for a loan to purchase one machine by being given a loan of €1.5m as the bank assesses the risks of Stavros Optiki EPE as being too high.

Will reducing the loan amount be effective in reducing the risks to the bank?

Indicative answer: *The reduction in the loan amount is due to credit rationing. The risks of Stavros Optiki EPE are substantial as the investment is conducted to retain some of the most important clients, suggesting that they might order their lenses elsewhere in the future, putting the future of the company at risk. Seeing a bleak future ahead, there are strong incentives for Stavros Optiki EPE to strategically default. The banks seek to limit this risk of strategic default by not allowing them to make a large investment, which will reduce the assets that could be retained by Stavros Optiki EPE and also reduces the benefits from not repaying the loan as the loan is smaller. Whether this approach is successful in this case is questionable, however, as the lack of a second machine might increase the risks for the future of the company, given that they cannot serve the demand of all their important customers equally well. This increased risk will increase the incentives for strategic default, reducing the positive effect of the credit rationing.*
Model(s) used: Chs. 7.2, 8.3

Problem 82

In order to encourage investment and promote economic growth, the government of Solano has opened up the banking market to foreign banks as well as granted licences to new domestically founded banks. It is generally agreed that this move has increased competition between banks and has brought down the loan rates companies have to pay. In an act of self-congratulation the finance minister praises the achievements of his administration at an event celebrating the fifth year since the relevant laws were enacted. He points out that loan costs have reduced by about 2% p.a. and his economic advisers have estimated that this added about 0.5% economic growth in each of the past 4 years for which data are available. Taking questions from journalists after his remarks, Alketa Shala asks how he can explain that since the liberalisation of the banking market companies complain that often they cannot get a loan of the size they seek, but banks will offer them only smaller loan than they would need to obtain the full benefits of their investment; no such problems were reported prior to the liberalisation, although there were much more frequent complains about the loan costs.

Assuming the finance minister were to answer honestly, what should his reply be?

Indicative answer: *With the increased competition between banks, the loan rate has reduced, reducing the profits banks can make from providing loans, which is positive*

for companies and promites investment. However, as with all measures, there is a downside and in some cases, the small profits now make in a competitive market does not allow them to absorb losses from companies defaulting on their loans. If companies take on large loans and do not have the ability to absorb much of potential losses themselves, for example if they are highly leveraged, then the bank will make losses from these loans. With the lower profit margin due to the lower loan rates, they cannot easily cover these losses and avoid becoming loss-making themselves. It is for this reason that banks may not be willing to give large loan to companies and restrict the amount they lend to reduce the potential losses they can make. It is thus that there is a downside to the liberalisation of the banking sector, but the evidence suggests that the positive aspects dominate.
Model(s) used: Ch. 8.4

Problem 83

Vuk Bjelica owns a chain of fastfood restaurants in all the main cities of Gunung. Having had great success in taking market share from his main international competitors, he has expanded quickly and opens new restaurants at the rate of one or two per month. The substantial investment required to fit out each restaurant is mostly financed through bank loans that have been granted easily given the success he had. However, recently his growth has slowed and he had to close some restaurants as the footfall reduced after an initially high turnover; overall he sees more opportunities for growth and remains optimistic about the future of his business. While he obtains loans easily thus far, he bemoans the high costs his bank charges him and attributes this to the lack of competition between the three incumbent banks in Gunung. Therefore he approaches a bank in the neighbouring country of Dharatan, who has a much more competitive banking system while sharing the same currency. The reaction to his loan application is also positive with a loan rate offered that is significantly lower than his bank is willing to quote. However, they are not willing to provide a loan necessary for the opening of ten more restaurants, approving only funds needed for six; in addition this comes with the stipulation that Vuk Bjelica has to retain more earnings and reduce the dividend he pays himself. They indicate that if his own funds in the company increases, they might consider further loans in the future.

Why is Vuk Bjelica only offered a loan to refurbish six further restaurants by the bank in Dharatan, while his bank in Gunung offers the full amount?

Indicative answer: *The key here is that the bank in Dharatan rations the loan as they see the high leverage of Vuk Bjelica's company as being too risky. They do not necessarily have a different assessment of the risk from the bank in Gunung, but instead the reason is that the banking system in Dharatan is more competitive. This higher level of competition reduces the profits banks make, as evidenced by the lower loan rate offered, and limits there ability to absorb any losses from loan defaults. That Vuk Bjelica's company is not risk-free is evidenced by the need to close some*

restaurants, suggesting that the initial expansion will now become more difficult and a default on loans is not impossible. The bank in Dharatan wants to limit the losses they have to bear and increasing the equity allows the company to absorb some of the losses first, making the loan less risky and allowing for larger loans in the future.
Model(s) used: Chs. 8.4

Problem 84

Unavu Pvt Ltd is a food company supplying ready-meals to canteens and schools. To finance a new packaging facility, six years ago they had taken out a loan of INR200m at a loan rate of 11.4% p.a. In the last six years the banking market in adjacent regions has seen the opening of branches by several national banks and companies now have the choice between five national banks, however in the region Unavu Pvt Ltd operates in only a single local bank is available. Poor transport connections within the region and to neighbouring regions limit the ability to use banks there. As a result of the competition between banks, loan rates in neighbouring regions have reduced and Unavu Pvt Ltd seeks to take advantage of the new lower loan rates, believing that it should pay only 8% p.a. if they were to take out a similar loan now. Although they have to pay a fee of 1.5% of the outstanding amount to repay their loan before its maturity in four year's time, this would be cost effective. Their existing banks is willing to offer them a new loan at 10% p.a., but without the ability to repay the loan before maturity, while a bank in the neighbouring region offers a loan rate of 9% p.a. with the ability to repay the loan at any time without a penalty charge. However, this loan offer is only for INR120m, well short of the amount required to replace the existing loan. Returning home and contemplating these offers, the owner of Unavu Pvt Ltd fails to understand why the bank in the other region only offers him a smaller loan, but requires a higher loan rate than expected, while his bank offers him a lower loan rate than he previously had. He does not see that his risk has changed or that the economic conditions overall are different.

Can you explain the situation Unavu Pvt Ltd finds itself in?

Indicative answer: *There are two elements that require attention, the first the credit rationing the company faces in the other region and the issue of the loan rates. Looking at the credit rationing aspect, the banking system in the other region is more competitive and this will have induced the credit rationing. The lower loan rates in that region will be evidence for banks being less profitable and thus not so easily able to absorb losses, making them more cautious when providing loans; this manifests itself in offering only a smaller loan such that the company itself could shoulder a larger part of any potential losses and hence reduce the risk to the bank. The original bank of Unavu Pvt Ltd does not face competition and can therefore charge a higher loan rate, giving it a higher capacity to absorb losses from any defaults and therefore doe snot need to ration the loan amount. The interest rates can be explained bya combination of competition and the possibility of early redemption.*

The current loan contract allows Unavu Pvt Ltd to repay the loan early for a small fee and their current bank offers them a new loan contract without this ability, which will reduce the interest they will charge as they do not face any adverse selection by the company repaying early to secure better loan terms like in this current case. This explains the reduction of the loan rate at their current bank. The fact that the loan rate at the bank in the other region is higher than expected is due to the fact that it allows the company to repay their loan at any time without an early redemption charge. This exposed the bank to substantial adverse selection as Unavu Pvt Ltd could accept any better loan offer at no cost, which will increase the loan rate they are charged.
Model(s) used: Chs. 6.6, 8.4

Problem 85

Jay Corston has founded his own plumbing business, JC Plumbing Ltd. and to be able to purchase the required equipment and a van to start his business, seeks a loan from a bank. The bank is positive about providing him with a loan, offering him a business loan for five year at a loan rate of 8.75% p.a. His wife thinks that the loan rate is rather high and compares it to the loan rates of 4.5% p.a. that are typically charged for mortgages. As they are currently living in a house they have inherited mortgage-free from her aunt, she suggests to obtain a mortgage for the business instead of the business loan as that would be much cheaper.

Is Jay Corston's wife correct to say that the mortgage is cheaper than the business loan?

Indicative answer: *The mortgage is a loan where their private home acts as a collateral for the loan. If the business fails and the loan cannot repaid from the business itself, the bank would obtain the house, which Jay Corston and his wife would lose. As many new businesses fail, there is a substantial risk of the company failing and the collateral being lost; this would increase the costs of the loan, not through a higher loan rate, but the potential loss of the home. While a detailed analysis of the risk needs to be conducted for a proper comparison, the loan rate here is not only costs of the loan.*
Model(s) used: Ch. 9.1.1

Problem 86

A new entrant to the banking market prices its business loans aggressively by undercutting the loan rates of the market incumbent by at least 0.5% p.a., while remaining just about profitable overall. Charging a typical loan rate of 8% p.a. on unsecured business loans causes the bank a loss, while charging 5% p.a. on a typical fully secured loan is profitable.

How do you explain the fact that secured loans are profitable and unsecured loans are not profitable, despite having a higher loan rate?

Indicative answer: *The loan rate for unsecured loans is higher than for secured loans as the bank will receive no payments in the case the companies fail to repay their loans, this gives the bank lower repayments overall, despite the higher loan rate. The bank is making profits from secured loans as the repayments arising from the collateral more than offsets the lower loan rate. This suggests that the bank should charge a higher loan rate on unsecured loans and lower is loan rate on secured loans.*
Model(s) used: Ch. 9.1.1

Problem 87

Foxton Housebuilders Ltd. is a small company focussing on the construction and renovation of environmentally friendly houses in the centre of local towns. Having successfully grown the business in the last few years, its owner, Peter Foxton, seeks to expand its business to include the conversion of former industrial sites into domestic accommodation. He sees this expansion as the next logical step in the development of his company. His bank, however, views his plans as an expansion into a different part of the building sector and is much more critical about his ability to compete with companies in this sector of the market. After long discussions they agree to fund his expansion, but require a loan rate that is 1.5% p.a. above what he recently agreed for a loan used in the development of houses on the outskirts of the same town. Taking this offer to consider it in detail, Peter Foxton believes that the bank is overcharging him and looks for a way to reduce the costs of the loan.

How can he reduce the overall costs of his loan?

Indicative answer: *Peter Foxton believes the expansion of his business to be lower risk than the bank, who sees it as a entering a new section of the market rather than merely a different type of housing. It is therefore that Peter Foxton could offer collateral and thereby reduce the loan rate. While this would increase his costs due to the possibility of losing the collateral, these costs increases are less than the reduction in the loan rate due to the fact that he believes the probability of nfailure to be lower than what the bank assumes.*
Model(s) used: Ch. 9.1.2

Problem 88

Arda Güner has responsibility for small business at the Alatya branch of Salem Bank, which includes the agreement of loans up to TRY10m. Having been in his role for 2 years, head office has seen a significant increase in unsecured loans from about 23% to now 70% of loans he approved, while at other comparable branches the fraction of such loans has remained constant in the region of 20-25%. In his justification, Arda Güner reports that he usually offers an unsecured loan along a secured loan with a lower loan rate, as has been practice at the bank and is followed in all branches. It was then up to the companies to choose the loan that is most suitable to their needs, again in line with bank policy.

How can you explain the observation that most companies chose the unsecured loan over the secured loan?

Indicative answer: *If Arda Güner's assessment of the risks of the companies is such that he assesses the risk as being lower than the company itself, then the conditions for the secured loan will not be sufficiently attractive for companies to demand such a loan. This is because the low risk assessment of Arda Güner will firstly make the loan rate lower than what companies expect and then the reduction in the loan rate when providing collateral will be small too, reflecting the low risk, while companies see higher risks. Thus they do not wish to put their collateral at risk as the lower loan rate doe snot fully compensate them for this risk as they assess it, and therefore will demand the unsecured loan. It is thus that Arda Güner assesses risk as lower as companies themselves that drives this observation.*
Model(s) used: Ch. 9.1.2

Problem 89

In an online discussion forum for small businesses two opposing views on loan conditions offered by banks emerge. One view can be summarises as 'Banks offer secured and unsecured loans, but whichever you choose they all cost the same in the end' and other view is that 'Secured loans are always cheaper'.

What are the different premises underlying these two statements?

Indicative answer: *Both statements probably assume that banks are equally competitive when offering secured and unsecured loans, but the first statement that loan costs are overall the same suggest that the reduction in loan costs for secured loans is exactly offset by the potential loss of the collateral. This will be the case as long as the bank and the company agree on the risks of the company. However, if the company assesses their own risks as being lower than the bank, then the second statement applies. the bank offering unsecured loans will charge a high loan rate, but this will reduce significantly with collateral as the bank reduces the high risk. At the same time, the company does not see an equivalent increase in the risk of losing the collateral as they believe the risk to be lower, making the provision of collateral*

more attractive. Thus the first statement assumes that banks and companies agree on the risks the company faces, while the seconf statement assumes that banks will assess the company as being more risky than the company assesses itself.
Model(s) used: Chs. 9.1.1, 9.1.2

Problem 90

Maryna Kovalenkova owns and manages Pobutova Elektronika TOV, providing electronic gadgets ranging from hand-held fans to sophisticated drones. Due to an upcoming major football tournament, she has identified a significant gap in the local market to sell minifridges combined with integrated beer dispensers. Her market research indicates a large potential in the short run for such devices and she seeks a loan to produce these in larger quantities. In order to increase her profits from this short-lived opportunity, she accepts a mortgage on her private home and secures a loan at a low interest rate. When providing her with the loan, her bank remarks that they really struggle to understand the gadget market and the opportunities therein, so cannot really assess objectively the details of her proposal. Maryna Kovalenkova's friends uniformely question why she would put her private home at risk for this one product and say she has clearly become a bit too involved in the business.

What is Maryna Kovalenkova's rationale for offering her home as collateral for this loan?

Indicative answer: *The bank admits that it does not has the ability to assess the risks of the companies operating in the gadget market, hence they cannot distinguish between companies, or investment ideas, that are low-risk or high-risk, while Pobutova Elektronika TOV is confident about their risk assessment. Clearly Maryna Kovalenkova believes that the investment is low risk and for this reason is willing to provide collateral in exchange for a lower loan rate, which will increase her profits. As she assesses the risk as low and chooses to provide collateral, knows it to be of low risk and will therefore offer an even lower loan rate.*
Model(s) used: Ch. 9.2.1

Problem 91

The national Chamber of Commerce conducts a bi-annual survey of business conditions and this includes a section about access to bank loans. It is a consistent complaint in the survey over many years that companies in some well-established industries are offered only loans at a relatively high costs and no offers are made, or are only made when pressured, of accepting collateral; in those cases where an offer is forthcoming, it commonly seems to be not very competitive and increases the costs to the company. Only in some cases are the conditions with and without collateral similarly attractive, but that seems to be limited to cases where the collateral consists of government securities, or precious and non-precious metals. On the other hand, other industries, such as newly emerging industries, or companies offering highly innovative solutions, frequently obtain attractive offers that would require collateral, except that companies usually do not hold many assets that can be used as collateral.

The Camber of Commerce seeks to find an explanation for these observations. What would this report show?

Indicative answer: *There are a number of issues to consider. Firstly, the provision of collateral is only beneficial to the company if there is a difference between the risk assessment of the bank and the company's assessment of their own risk. If the company assesses itself to be of lower risk than the bank, the provision of collateral would be beneficial, otherwise there would be no difference in the overall costs. In the case of the well-established companies it can reasonably be assumed that they are well-understood by banks with information being widely available and hence where is unlikely to be much difference in the risk assessments of the banks and the company itself. Hence there is no asymmetric information between banks and companies, making the provision of collateral not beneficial. This inference assumes that the value of the collateral to the company and the bank are identical, as they will be in the case of securities and other commodities that are easily marketable as reflected in the results. If the value of the collateral is higher to the company than the bank, as is likely to be the case in most other cases, the reduction of the loan rate when providing collateral does not fully compensate the company for the provision of loans and hence collateral is not attractive. For companies that operate in newly emerging industries or are entering new grounds, the banks will have limited information on the companies and hence be less able to assess risks, leading to asymmetric information between banks and companies. There collateral would be beneficial as it could be used to signal the qualities of the company to the bank. A problem with many such comapnies is, however, that they often do nto have any collateral that would be acceptable to banks and therefore have to rely on the much more costly and less desirable unsecured loan.*
Model(s) used: Chs. 9.1.1, 9.1.2, 9.2.1

Problem 92

As a manager with Alara Bank you have frequent meetings with customers that have taken out loans and you meet a variety of senior managers at companies of all sizes. Reflecting on another hectic day, you discuss your experience with a colleague over a few drinks. Listening to your colleague you hear him talk about that it is the companies that are facing difficult times that seem to be most relaxed about how things will turn out, rarely showing much urgence to address upcoming issues, while those whose companies are doing well and show no sign of being seriously affected by events, are always on top of even the smallest issues. Sighing, he concludes that he has found no remedy against such disparity in behaviour.

Can you suggest to your friend what might be done?

Indicative answer: *The problem is that the benefits of addressing issues in a company, that is exerting effort, might be higher for companies facing high risks than those facing lower risks, it is not cost-effective. The nevertheless low chances of success after the intervention leads to a situation in which the costs of exerting effort outweighs the chances of this effort making a meaningful difference. This will be the case for those companies facing difficulties mentioned here. This can be addressed by increasing the cost of failure, for example by requiring collateral for any loan. The loss of collateral is an additional cost to the company if it fails and it will thus provide incentives to increase the effort in addressing the difficulties the company faces.*
Model(s) used: Ch. 9.2.2

Problem 93

Over many years, managers at South Suny Bank have got to know their customer Larkhill Pharmaceuticals Ltd. well. The owners of the bsuiness have always been good managers, but at times preferred the golf course to the board room. They were, however, always fully engaged with more serious problems, only smaller ones were frequently ignored or delegated to address. While until recently they had rented their production site and had very few assets as most facilities were leased, they have now found a new investor that enabled them to acquire the property they were renting. Looking at expanding their business, they have asked for a loan to pay for the construction of a second facility on their site. This loan was granted without question and Larkhill Pharmaceuticals Ltd. provided their land as collateral for this loan to reduce the loan rate. It now seems that since this loan was granted, the management seems to be much more focussed on their business, trips to the golf course have become rare, and they are always fully engaged with even minor problems.

How can you explain this change in the behaviour of the management?

Indicative answer: *The new loan of Larkhill Pharmaceuticals Ltd. was secured with the land they own, thus they have provided collateral for their loan. This has increased the costs of failure, the loss of their land. It is for this reason that management has increased their effort levels to avoid this loss, which previously was not present as they did not provide any collateral.*
Model(s) used: Ch. 9.2.2

Problem 94

Terme Moreno SpA operates nine spa and wellness hotels across Italy. In an expansion drive a few years ago it had a acquired another 6 properties to build new hotels, but these projects have been put on hold due to a deep and prolonged recession that has in particular affected the luxury market in which Terme Moreno SpA is operating in. Currently these properties are surplus to requirements, but have been retained for future development. The hotels are at the moment operating well below capacity and the immediate future of Terme Moreno SpA does not suggest improved business. In order to position itself better in the market, they seek to conduct a programme of wide-ranging updates of their existing hotels. Their bank agrees to financing these investments in principle, but in order to grant the loan seek collateral in form of the undeveloped properties. In addition, the bank requires Terme Moreno SpA to agree to them using their property as collateral in their own financing of this loan. The bank has hinted that without that agreement, the loan conditions would be significantly more onerous for Terme Moreno SpA, if they would be able to obtain a loan at all.

In addition to obtaining the loan in the first place, why would Terme Moreno SpA agree to such an arrangement?

Indicative answer: *Given the current economic conditions, the loan is assessed by the bank to be very risky, and the same assessment can be expected from other banks. By allowing rehypothecation, the collateral becomes more valuable to the bank. They can use the collateral to obtain funding themselves, reducing their costs and this in turn allows them to offer better loan conditions to Terme Moreno SpA, making such an arrangement attractive. It also has to be taken into account that the properties used as collateral are held in reserve and currently do not contribute to the company's profits; thus losing them if the bank were to fail in their obligations would not immediately affect the prospects of Terme Moreno SpA, although future expansion plans if the economy performs better again might be jeopardized. Nevertheless, the benefits of better loan conditions combined with the low risk of losing an unproductive asset might make this arrangement attractive to Terme Moreno SpA.*
Model(s) used: Ch. 9.3

Problem 95

Mettli AG is a Swiss pharmaceutical company that is best known for developing drugs for rare diseases using the latest advancements in science. They had some widely publicised success in recent years, but also a much larger number of failures which is less widely known. In addition to their significant research into innovative drugs, requiring substantial investment, they also produce widely-used drugs which are sold in pharmacies without prescriptions, providing a stable income. Having mostly financed themselves through private equity investments until recently, they now seek a loan for the general financing of working capital for the company as they seek to expand sales of their widely-used drugs into more markets that have recently been opened and where few competitors exist. Having approached a number of banks, they have been disappointed at the response they have received. All banks were only willing to provide loans well below the amount sought; while this would allow them to expand into some markets, it would fall short of their ambitions. It is only once they revealed that they would be willing to use their future income from these drugs as collateral, that banks were willing to provide loans of the size required.

How can you explain this change in loans offers by banks?

Indicative answer: *Initially, Mettli AG has been subject to credit rationing, which upon providing collateral has disappeared. Credit rationing emerged as the banks were not convinced that the loan would be used for the low-risk expansion of their business in widely-used drugs, but thought that it might be used to finance the much more risky development of new drugs. By limiting the loan amount banks sought to prevent Mettli AG to make the risky large investments into research using their loan. Once the collateral was pledged, it became apparent to them that the low-risk expansion would be financed; collateral is usually only pledged if the risks are low as not to lose the collateral. This reduced the risk of the loans from the bank's perspective and credit rationing disappeared with this additional information, Mettli AG was able to secure the full loan.*
Model(s) used: Chs. 8.2, 9.2.1

Problem 96

Johan Rasmussen has been repeatedly turned down for a loan at the company he leads, Rasmussen Metals. It was only after he found a specialist lender which focussed on companies in mining non-precious metals and related industries, that he was able to secure a loan to modernise his business with the latest technology. In order to obtain the loan, he had to agree to use his stored metals as collateral and that the lender could rehypothecate this collateral. Through trade publications he has become aware that it has become a well-known problem for companies like his to obtain loans, even though they are highly profitable and can easily use their extensive holdings of metals as collateral. The same publications also state that companies larger than him do not seem to face the same constraints in financing their businesses, even though their risk might be larger due to exposure in politically unstable countries. A brief survey suggested that of larger companies only 5% of respondents had to allow rehypothecation, while for mid-sized companies this rose to 54% and small companies were often not able to gain loans at all, even when rehypothecation was offered.

How can you explain these results?

Indicative answer: *Rehypothecation is only feasible if the loan is sufficiently large, which is more likely the larger the company is as commonly the loans demanded will be larger. This would preclude small companies from accessing such loans. On the other hand, loans would be feasible for large loans even when not allowing rehypothecation, thus allowing larger companies to provide collateral only.*
Model(s) used: Ch. 9.3

Problem 97

'Companies we don't know well are free to decide whether they provide collateral or not. Good companies are happy to provide collateral for their loans and those who don't want to, are pressured to provide at least some, even if they resist.' This was said by the board member for corporate lending at Gundana Bank to freshly recruited graduates at a training course covering the principles of corporate lending.

Why does Gundana Bank follow this, rather crudely expressed, principle?

Indicative answer: *If Gundana Bank does not know the company well, they will face asymmetric information about their risks and hence the willing provision of collateral can allow them to distinguish between companies that are low-risk and hence provide collateral willingly to reduce the loan rate, and those that are high-risk and will be reluctant to do so. With this distinction, they can now address a moral hazard situation in exerting effort. Companies providing colalteral face an additional costs when failing, the loss of collateral, and will therefore exert additional effort to reduce the risk of the company, which is in the interest of the bank. Thus those companies not volunteering collateral, and thus identified as high risk, would be required to put up some collateral to increase their effort to ensure the loan is repaid.*
Model(s) used: Chs. 9.2.1, 9.2.2

Problem 98

Stimata plc is a major global retailer operating stores under various brand names, including fashion stores, homeware stores, and also some department stores. It has been a long-lasting practice that they finance some of their stocks through bank loans and sometimes provide collateral in the form of the amounts owed to them by credit card companies. During the previous negotiation for a new loan their main bank, Doren Bank, has suggested that in the future they are allowed to use their credit card receipts as collateral for their own use. Stamata plc signed a general agreement to this as the bank re-assured them that this would be to their benefit. In the current negotiation for a loan to purchase stock for the busy Christmas period, Stimata is surprised to learn about the conditions the bank offers. While in comparable circumstances previously they had offered a loan rate of 8.2% p.a. for an unsecured loan and 5.3% p.a. for a secured loan with 70% of the loan secured, they now offer 8.9% p.a. and 5% p.a. with 85% of the loan secured, respectively.

How can you explain the changes to the loan rates offered to Stimata plc?

Indicative answer: *Allowing the bank to re-use the collateral in their own borrowing is knows as rehypothecation. This rehypothecation increases the value of collateral*

to the bank as it can be used as collateral for their own borrowing. While usually the collateral is worth less to the bank than the companies providing it, this additional use of the collateral will increase its value to the bank, the value of λ in chapter 9.2.1 will increase. This will in turn mean that it is more beneficial for the bank to obtain collateral, hence the lower loan rate for secured loans. As there is a higher benefit for banks if collateral is provided, they seek to provide additional incentives for companies to provide such collateral, increasing loan rates for unsecured loans. From the model in chapter 9.2.1 this can be seen by the the equilibrium point H in figure 9.1 increasing due to the higher slope and with it the isoprofit curve of the company, starting at H will cross the isoprofit curve at a point L this requires a higher collateral and a lower loan rate.
Model(s) used: Chs. 9.2.1, 9.3

Problem 99

Lydia Urban is considering the loan application by GameDev Ltd., a company purchasing the rights to poorly implemented video games appealing to niche markets which they then develop further so they appeal to a wider market. The company has approached National Midlands Bank, Lydia Urban's employer, for a loan to generally finance their operations. During discussions, Lydia Urban has learnt that the two owners of GameDev Ltd. have ambitions to develop their own games rather than improving existing ones. She sees such an approach as much more risky than the further improvement of existing games and her analysis suggests that the bank would not want to support such a risky investment. She has thought about ways to ensure the company owners do not use the loan to fund their ambitions to develop new games and instead focus on their currently successful business. The size of the loan cannot be reduced as that would jeopardise the current business and the company does not own any assets of note that the bank could take as collateral.

Despite her concerns, are there ways that Lydia Urban can structure the loan to ensure it is not too risky for the bank?

Indicative answer: *A possibility would be a debt covenant. Lydia Urban could require the company to invest a minimum amount into their current business of improving existing games and thus limit the exposure to the risk of the owners developing their own games. This would ensure that the risks of the loans are such that it can be granted by the bank, but it nevertheless gives the owners some freedom to commit some resources to their ambitions, if they desire to do so.*
Model(s) used: Ch. 9.4

Problem 100

Kiyoshi Satakura and Chia-hao Tsai both own a small company that share the same building offering office space to small companies, together with joint kitchen and social facilities. Meeting while having a coffee break, they start talking about the difficulties when dealing with banks. Kiyoshi Satakura finds them a limit on his ability to be innovative, nearly everything he thinks has the potential for generating high profits, they put a limit on. Therefore he cannot develop his ideas fast enough as he has to spend most of his time on well-trodden paths and can only devote some of the funds and time on new ideas. Chia-hao Tsai's experience is quite different. His bank encourages him to explore new ideas and is not satisfied with his approach of pursuing safe, if low-yielding, projects. Only half jokingly they agree that they probably should swap banks.

Would swapping banks solve their problem of one company being hindered in developing innovations, while the other being pushed towards developing them?

Indicative answer: *In both cases, banks impose covenants on the companies to pursue a combination of risky and safe investments. This ensures that in the case of Kiyoshi Satakura the overall risks are not too high and the bank can generate sufficient profits, while in the case of Chia-hao Tsai the banks wants him to take on more risks such that he can generate sufficient returns to repay the loan, which with his low-risk strategy cannot be ensured. It is therefore that swapping banks is unlikely to change the situation they are in as the different treatments they receive is not the result of different risk assessments by these banks or different willingness to take risks, but it is the way they operate their respective companies that solicits opposite demands from the two banks.*
Model(s) used: Ch. 9.4

Problem 101

To support banks in an extraordinarily deep recession that hit the economy of Vonuta due to a collapse of the price in non-ferrous metals as well as beef, the two main products that are produced and also exported, the Reserve Bank of Vonuta has administered a loan guarantee scheme on behalf of the government. Banks were able to purchase guarantees at a low cost to cover any losses from loans they have provided. While this programme was intended to support the banks so they continue to lend to companies, it had the side effect that banks in some regions face deposit withdrawals as a result of high unemployment, but were able to generate liquidity by selling loans to other banks who were less affected by such deposit withdrawals. This has led to a liquid secondary market in loans between banks. With the economy recovering, the government decides to wind down its loan guarantee scheme, even though the recession is still persistent in some parts of the country and banks face the occasional withdrawal of deposits as a consequence. The governor of the Reserve Bank of Vonuta warns the government to not yet abandon the guarantee scheme.

Why would the governor issue this warning?

Indicative answer: *The guarantee scheme is instrumental in enuring a liquid secondary market for loans and thus allowing banks facing deposit withdrawals to generate liquidity from the sale of loans. Bank sought to insure loans with high risk and these were removed from the pool of loans traded, improving the overall quality of the loans in the secondary market and thereby reducing adverse selection costs. With adverse selection reduced not only did the banks receive a higher price for their loans, improving their liquidity position further, but it also attracts more purchasers and the market will not stop functioning due to too high adverse selection between the selling and purchasing bank. With the withdrawal of the guarantee scheme this will change and there is a danger the secondary market might collapse, leaving bank facing deposit withdrawals without the ability to obtain liquidity, unless the Reserve Bank of Vonuta would provide this.*
Model(s) used: Ch. 9.5

Problem 102

The government has operated a guarantee scheme for bank loans for many years. A recent audit exposed the costs of these guarantees to be approximately US$1.46bn p.a. In order to reduce the budget deficit, it had initially been decided to abolish the scheme altogether, but on intervention by the central bank and a wide range of business representatives, it will now be maintained. However, it has been decided that the guarantee needs to cover its costs and the fees payable by banks to obtain such guarantees have increased accordingly. Consequently, the amount of loans guaranteed fell from approximately US$120bn to just below US$17bn. On the second anniversary of this change, the editor of the Financial Gazette & News makes the increased fees charged to banks responsible for the more widespread need of the central bank to intervene in the banking sector and provide liquidity support.

How does he explain the connection between the increase in the fee for loan guarantees and the need for central bank interventions in the banking market?

Indicative answer: *The increase in the fee for government guarantees of loans makes the use of such guarantees not profitable for banks who subsequently do not seek such guarantees, as evidenced by the strong fall in its uptake. This will have led to banks facing deposit withdrawals obtaining lower prices when seeking liquidity through the sale of loans; this is the consequence of more high-risk loans being offered in the market and therefore the overall price to fall and the market even to collapse as adverse selection was too high. Thus, banks are less able to obtain liquidity in the secondary market for loans from other banks and therefore will have to rely on the liquidity provision of the central bank.*
Model(s) used: Ch. 9.5

Problem 103

Helmut Hollinger has been made redundant and faces financial difficulties. In order to save costs, he changed his mobile phone provider and signed a new contract at a lower cost than the contract he was previously on. As part of the contract he can opt-in for the mobile phone provider to inform a non-profit organisation called CreditCheck, jointly overseen by banks and consumer finance companies, whether he maintains a clear track record of making payments on his contract. As there are no repercussions for not opting-in, his friends tell him that he was silly to do so as now he will find it much more difficult to obtain any such contract or a loan in the future if he misses any of his payments; they will just write him off as a bad risk.

Was Helmut Hollinger right to sign the opt-in about sharing information on his payment history?

Indicative answer: *In his current situation as being in financial difficulties it is reasonable to say that Helmut Hollinger's risk of defaulting on his payments is high. By making regular payments and this being disclosed to other lenders, he can improve his standing and will benefit from better conditions in the future, he will build up a credit record; this will be positive. This benefit needs to be balanced against the possibility that he is not being able to make payments as required and thus being more fully identified as not being creditworthy, which is likely given his financial circumstances; this will effectively shut him out of the credit market. Not disclosing his track record in making payments will not improve his credit standing and he will continue to be assessed as high-risk, even if he can make all payments as requested. It is clear that in this case the potential gain in credit rating outweighs the costs of confirming his low status.*
Model(s) used: Ch. 10.1

Problem 104

MicroComp Ltd. is a longstanding company providing calculators and other hand-held scientific devices allowing engineers to make calculations in the field. This company enquires about a loan at Torres Bank, who have no knowledge about the company or the type of market it is active in. They know that the company previously held bank loans as this is available from the sparse information they have provided. Before making a full analysis of the company and its risk, they seek information from Credit Collect, a credit reference agency that all banks cooperate with. On seeking information about MicroComp Ltd., they obtain a blank return, suggesting that no information is held. After receiving this blank return, the branch manager who had been approached, calls in a junior employee and tells him that because there is a blank return, he should assess the company fully and request the usual additional information. The junior employee is confused as just a few days prior in a similar situation he was told to refuse an application in the early stages, despite information being found on a loan having been obtained recently.

Why is the junior employee told to assess MicroComp Ltd. fully?

Indicative answer: *With MicroComp Ltd. having had bank loans in the past and no information available from the credit reference agency suggests that they did not consent to information being shared. In contrast to that, the previous company did agree to sharing information, even though it was too early to find any meaningful entries. It is that low-risk companies typically do not agree to sharing information with credit reference agencies, such as Credit Collect, while high-risk companies are happy to do so. It is therefore that the branch manager sees the refusal by MicroComp Ltd. to share information as a positive signal about their quality, while he saw the willingness to share information in the previous case was seen as a negative signal about the risks of the company.*
Model(s) used: Ch. 10.1

Problem 105

Merkot Avtaha BM develops and sells security systems for private houses and small companies. Being very successful in their home market and having gained a leading position, they now seek to expand their business to other countries. To this effect they seek to build capacity by establishing and staffing subsidiaries and developing local marketing strategies, planning to offer their products and services in 2-3 years time. To finance this first step in their expansion, they approach a number of banks and after having agreed with one bank a partial financing of investment, they find that on learning this fact other banks turning much more reluctant to discuss specific loan terms and seem to drag out the negotiations. This is nothing which they experienced before when discussing loans for exploring the feasibility of new products and services, where they always have played their cards close to their chests. In confidence, a former employee of theirs, now working for one of the banks they have approached, tells Merkot Avtaha BM that they should not have said they had found partial funding with another bank.

How could have this disclosure reduce their chances of securing funding for the entire investment?

Indicative answer: *We can interpret the capacity building as an investment that yields significant private benefits to Merkot Avtaha BM, namely their ability to sell their products and services in new markets. Their exploration of these markets and establishing a presence will not yield much direct benefits that will allow a repayment of the loan, but will be beneficial to them only in the future once they enter these markets. While Merkot Avtaha BM will have an ability to repay loans from its existing operations, banks will be concerned about the risk to their loans as they are 'second in line' as they agreed the loan later than the first loan. As long as banks did not know where they would be standing in the priority list of loans, like with the non-disclosure in previous negotiations, they would offer a loan that would take both possibilities into account. Now with increased risks as they know they are obtaining the more*

risky element of the loan.
Model(s) used: Ch. 10.2

Problem 106

Rozbiork Sp. z.o.o. is a demolition company focussing on the demolition of individual buildings seeking a loan from its bank to replace ageing machinery. In a recent review meeting with its bank it had also explored the possibility of a much larger loan to explore a possible expansion of the business into large-scale demolitions of entire housing estates and company complexes. When entering negotiations with their banks for the replacement of machinery, their banks asks them to categorically confirm whether or not they are negotiating with another bank about obtaining a loan. They had never experienced such a request before.

How would the bank justify their demand to be told about Rozbiork Sp. z.o.o. being in discussion with other banks about a loan?

Indicative answer: *The bank wants to know whether another bank might provide a loan that would allow Rozbiork Sp. z.o.o. the ability to pursue the discussed expansion of the business. This would only be much risker, but as it is an exploration has mainly private benefits to the company that does not directly support the repayment of the loan. If the Rozbiork Sp. z.o.o. is in negotiation with another bank, their bank might only get the more risky second loan. For this reason they want to know their position. If they are negotiating with another bank, the bank might not be willing to grant the loan at all.*
Model(s) used: Ch. 10.2

Problem 107

Discussing new rules by the financial regulator that requires banks to share information about the companies they provide loans to, two business owners are disagreeing about these rules. Hamish McCourt says he cannot care less if his bank shares information about his company or not, he says in the end it will all balance out. In contrast, Kieran Short is concerned about the sharing of information and says that this will reduce competition between banks and loan rates will go up.

Whose position is more justified?

Indicative answer: *Both are correct in a way. Hamish McCourt is correct that as long as banks are competitive, the provision of information will not make a difference to companies overall. While with information sharing between banks, competition will be consistent over time, without such information sharing banks will compete more to obtain a customer in the first place, lowering loan rates, and then seek to exploit*

their informational advantage afterwards, increasing loan rates; overall the loan rate is the same. What Kieran Short is concerned about is the lack of competition to attract customers in the first instance and he might lose the low initial loan rate as banks will have less incentives to compete for new customers as there is less informational advantage to be gained. Hence, if Lieran Short is concerned about the initial loan rate increasing, he is correct, but he will benefir from lower loan rates after that.
Model(s) used: Ch. 10.3

Problem 108

An investigation by the Competition Authority has found that loan rates offered by banks to their customers are in most cases not competitive and banks making higher profits than is justified. On analysing the information available, they conclude that banks are abusing their informational advantage to generate high profits from existing customers and therefore suggest to require banks to share information about their customers. Banks refute the allegations of making excess profits and point out that the profits they make overall are not excessive, a finding which was supported by the investigation of the Competition Authority; however, their response implies that they are merely concerned about the loan rates charged to existing customers and that the informational advantage makes it more difficult for companies to obtain loans from another bank.

Will the proposed measure of sharing information between banks benefit companies?

Indicative answer: *The overall effect of this measure will be nil. Evidence from the banks, not disputed by the Competition Authority, suggests that banks overall are competitive. While banks enjoy an informational advantage and charge higher loan rates than full competition would imply, they use these higher loan rates to recover any losses they made by offering very low loan rates to attract new customers. It is thus that overall companies would be as well off as before, competition would move from attracting customers to existing customers. The overall loan costs to customers will remain unchanged.*
Model(s) used: Ch. 10.3

Problem 109

’Using credit reference agencies is solely for the benefits of banks, why else would they insist on everyone allowing them to do so?’

Is is statement correct?

Indicative answer: *If banks are competitive, the overall loan costs to companies do not change, whether information is exchanged between banks or not. What might change is how competition affects loan rates, with sharing information, loan rates are more consistent over time, while without the exchange of information through credit reference agencies competition for new cistomers will be more fierce and introductory loan rates lower than later loan rates where initial losses are recovered. The profits of banks are also remaining the same overall and hence the claim is not justified. However, companies with different levels of risk might have different preferences for the preferences of information disclosure, more risky companies generally preferring the disclosure of information, while less risky companies prefer banks to not disclose this information. While this will affect the profitability of individual loans to banks, the profits of banks across the portfolio of loans remains unaffected. Where information disclosure might have a positive effect on banks is when it comes to financing investments that are more beneficial to the company than the bank due to private benefits being generated to the company. If such investments require loans from multiple banks, the company could exploit the lack of knowledge a bank has about other loans; if this information is shared, then a larger loan might not be forthcoming if the bank deems the risk too high. It is then that the sharing of information is in the interest of the bank as it will not provide such a loan, but detrimental to the company who misses out on this investment.*
Model(s) used: Chs. 10.1, 10.2, 10.3

Problem 110

Clemens Plumbing Ltd. operates regionally, having employed 27 plumbers and offering the whole spectrum of plumbing services from small repairs to working on newly-built houses. Over the years their bank has become very familiar with his business and while Clemens Meyer, the owner of Clemens Plumbing Ltd., does not always see eye-to-eye with his bank manager and had to take out a loan at another bank offering worse conditions, in most cases his bank was able to offer loans at good conditions. Clemens Meyer certainly has the feeling that other banks do not really understand his business as it can be highly cyclical with fierce competition making generating profits a challenge on every contract. His bank has now approached him to inform him of a requirement that they offer to put all information they hold on his company onto a secure database, which can be accessed by all banks.

Should Clemens Meyer accept this offer?

Indicative answer: *Clemens Plumbing Ltd. is not very profitable and seems to be exposed to significant risks, it may therefore not be in his interest to agree to this open banking initiative. Unless their current bank is not very good at assessing their risks and other banks are much better, there is no benefit for Clemens Plumbing Ltd. from allowing his bank to share their information. With other banks learning more about the high risk of Clemens Plumbing Ltd., its chances of obtaining a loan from*

another bank are reduced and competition to provide him with a loan is reduced, allowing their bank to charge higher loan rates.
Model(s) used: Chs. 10.1, 12

Problem 111

Yasin Torki has set up Torki Jewellery, a shop that designs and sells jewellery in his shop as well as online. When applying for a business development loan offered by a local bank specialising in supporting local shops to fit out the shop, he is asked whether the bank is allowed to share basic information with a credit reference agency, such as the fact he has a loan and whether he makes payments on time, as well as sharing information in an open banking agreement. His bank makes it clear that his decision will not affect their decision whether to grant a loan, so he is free to agree to both, either, or none. Not understanding the implications of making such a decision, he seeks advice.

What would you advise Yasin Torki?

Indicative answer: *Torki Jewellery is a new business and it can be reasonably inferred that as most new retail businesses, whether they are operating physical shops or online, the risks will be considerable and the profits are usually low. On this basis there is unlikely to be much benefit in open banking. The bank Torki Jewellery uses specialises in local shops, so will most likely have a good expertise in assessing risks that is not bettered by other banks. In this case sharing information will provide no benefit but might limit competition if the high risk of the business is revealed to other banks. However, Torki Jewellery should agree to providing information to credit reference agencies. Information that they repay their loan can only be seen positive by other banks and will therefore lead to a lowering of the risk these banks associate with Torki Jewellery, which is beneficial and will force his bank to offer him competitive loan rates.*
Model(s) used: Ch. 12

Problem 112

In order to increase competition between banks and reduce their ability to exploit any informational advantages, the Association of Industry, a lobby group of larger industrial companies, launches a campaign to make open banking compulsory for all businesses rather than an for each business to opt in or opt out. They seek support for their campaign from other groups of businesses, including the Founders' Guild, representing mostly young companies in the technology sector.

Should the Founders' Guild support the efforts of the Association of Industry?

Indicative answer: *The Founders' Guild will mainly represent small new companies, which, although not inevitably but in most cases, will be not very profitable yet and be classified as highly risky. As such their members will unlikely benefit from open banking, which is benefits those that are low-risk and profitable, such as those companies that the Association of Industry is most likely to represent. Sharing information about high-risk companies will only re-enforce their status as such and therefore reduce competition between banks for their custom. It is therefore that the Founders' Guild should not join the efforts of the Association of Industry.*
Model(s) used: Ch. 12

Problem 113

In the financial press it has been reported that Reto Bank AG requires a recapitalisation as it made large losses due to guarantees it had provided for securitised loans. Ueli Zuger is in the process of applying for a loan at Reto Bank for his company and concerned about the fact that his loan might be sold. His rationale is that because the bank clearly sells off loans, they must a charge a higher loan rate than other banks not selling off loans, as they need to satisfy the demand for yield of those purchasing the loans.

Is his assessment of the impact of securitisation correct?

Indicative answer: *The impact will be the opposite, selling off these loans to investors will reduce the loan rate of loans or keep it unchanged. The reason is that the interest payable on the securitised loan gives an indication of the risks the loans pose, something which depositors cannot determine without incurring additional costs. These costs savings will be applied either to benefit the purchasers by offering them an interest rate on the securitised loans that exceeds the deposit rate, borrowers benefit from a lower loan rate, or a combination of these. Thus Ueli Zuger's concerns are unfounded and he should support Reto Bank AG in securitising loans.*
Model(s) used: Ch. 13

Problem 114

'The thing is, a bank is like a drug dealer: once they have you hooked, they milk you forever.' This comment was made by an activist protesting against the high profits banks have been found to make off loyal customers.

While a crude comparison, is there some truth in this statement?

Indicative answer: *Banks will obtain information on their customers which other banks will not hold. While a bank had costs to acquire this information, once it holds the information it has an advantage over other banks which do not have*

this information. Banks can exploit this by offering non-competitive prices to their customers in the knowledge that due to the additional costs other banks face, they will not receive a better offer. Thus, banks are able to generate excess profits of existing customers, which the protester referred to. However, banks will compete to attract such customers in the first instance and knowing they will be able to extract excess profits in the future, they will offer low introductory offers. It is thus that customers benefit in the initial phase a s anew customer from better than average conditions, which are then recovered later. Thus, customers are overall not worse off.
Model(s) used: Ch. 11.1.1

Problem 115

Jaroslav Svoboda complains that banks punish successful companies with high loan rates and companies that fail, obtain lower loan rates. He bases his assertion on looking at the loan rates he, and other successful business he is familiar with, pay and comparing them with those paid by his acquaintances that have failed with their businesses. He calculates that unsuccessful business paid approximately 5.4% p.a. on their loans, but those thriving pay 6.2% p.a.

Is Jaroslav Svoboda's complaint justified?

Indicative answer: *Banks compete to attract companies and they will do so by offering a low initial loan rate. Once a bank has acquired sufficient information about a company, they will have an informational advantage and will exploit this by charging a higher loan, recovering the losses from their initially low loan rate. It is now that companies who are failing, will never reach that second stage of the bank being able to recover their initial losses; this will make it look like banks offer a lower loan rate to business that fail than to those that succeed. However, there is some degree of truth in Jaroslav Svoboda's complaint in that banks will anticipate that some business will fail and thus banks can never recover these costs. This will lead to initial loan rates to be not as low as they would otherwise be. Hence, successful business pay some of the price of failing business being present in the market.*
Model(s) used: Ch. 11.1.1

Problem 116

Omondi Kimani owns a number of convenience shops in Karugatu, while his brother Atieno owns three petrol stations with associated shops. Despite being to an extent competitors, they have maintained a very good relationship on a personal as well as business level. At a family meeting Omondi Kimani complains that his bank seems to increase his loan rate every time a loan is up for renewal, in the last five years it has increased from 11.2% p.a. to 11.9% p.a., without any material changes in his business or the economy. Atieno Kimani laughs and says, 'That's what you get if you are discussing all the details with your bank. I keep mine at a distance and have paid 12.3% p.a. five years ago, and now it is 12.5% p.a.'

How can these differences be explained?

Indicative answer: *Omondi Kimani has a close relationship with his bank and will therefore have build up substantial information over time about the business. This gives the bank an informational advantage that increases over its competitors with time and they can exploit this informational advantage by offering less and less competitive loan rates. In contrast to that, Atieno Kimani does not have a close relationship with his bank and therefore his bank cannot accumulate much information, resulting in a small increase of information for the bank, who will thus not increase its informational advantage over other banks and can therefore not raise the loan rate much. However, the less precise information his bank holds, leads to him paying a higher loan rate.*
Model(s) used: Ch. 11.1.2

Problem 117

Looking back through past loan agreements, Rafael Noval observes that over time loans for his company have become ever more expensive. Having set up his small company offering swimming tuition in private pools around holiday homes in southern Spain, he was offered an attractive loan rate of 6.5%, which then on renewal only 2 years later increased to 7.5% and then every year increased by 0.25% afterwards, without the general interest level being increasing during that time period. He believes that his now well established business would be much safer for banks than it was when he founded it. Looking around for alternative loans, he observes that no other bank would offer him a better loan rate. However, his friend Maya Fernandez has just set up a new business looking after gardens of holiday homes and was able to secure a loan at a loan rate of 6.75%, despite having no meaningful gardening or business experience.

How do you explain this observation?

Indicative answer: *Banks build up information on the quality of companies seeking loans over time by collecting information during the ongoing relationship. This allows them to gain an informational advantage that can be exploited by not offering competitive loan rates, knowing that the lack of information by competitors does not allow them to offer better loan conditions. Banks compete to attract companies to take out the initial loan, explaining the very low initial loan rate offered to both companies. They will then seek to recover these costs through non-competitive loan rates in future loans. Switching banks is not necessarily a solution for companies in this situation; in principle banks would compete to induce a switch of a company towards them by offering attractive loan rates. However, companies that are willing to switch to another bank for a better loan rate, are likely to do so again for the next*

loan and the bank is not able to recover the costs of the initially low loan rate. Hence this competition between banks for new customers only works for new companies.
Model(s) used: Ch. 11.1.2

Problem 118

A code of conduct has been brought in to reduce the impact on practices that limit competition between banks. A specific concern had been how banks make it difficult for customers to change their banking relationship by closing accounts immediately if a business seeks accounts elsewhere and withdrawing credit lines instantly with any outstanding balances to be repaid within a working day. The new code of conduct now requires banks to maintain the account for at least three months and forward any payments received to the new account of the business and require the repayment of any used credit lines in no less than 10 working days. It is hoped that the resulting increase in competition will be beneficial to businesses.

Will business all welcome the new code of conduct?

Indicative answer: *The code of conduct will certainly reduce the costs of business as changing banks becomes less onerous in that they can receive monies in the old account for a while, not having to inform all of their customers immediately and relying on them using the new account, and have time to arrange credit lines or other loans with their new banks to repay any outstanding loans with their old bank. However, this reduction in the costs of changing banks may increase the loan costs. This is because the lower costs of changing banks may induce more high-risk businesses to change banks in search for new loans. This will increase the risks of companies in the market for new banking relationships, necessitating an increase in the loan rate. If the loan rate when changing banks is increased, the loan rate for those not changing banks can also be increased as they will find less attractive loan rates being offered by other banks.*
Model(s) used: Ch. 11.1.3

Problem 119

Increasingly complex compliance rules make it more and more difficult for individuals and businesses to open accounts and obtain loans with banks. Banks have to go through a lengthy process to be satisfied about the identity of all persons having access to accounts and for businesses have also to make sure they are no involved in any illicit activities as well as having systems in place ro ensure they make and receive payments that are legal. Ensuring banks follow all rules has made the process of changing banking relationships more and more time consuming and costly for businesses. In an attempt to avoid even more onerous compliance rules being put into place, banks have been pointing out that these costs to business and banks will reduce competition as businesses will find it nearly impossible to change banks. Supporters of stricter compliance rules point out that this seems not to be a problem as loan rates in recent years have come down, despite rules having been tightened in recent years.

How could the bank argue that tightening rules further will be detrimental to competition?

Indicative answer: *Thus far the increasing costs of changing banks has led to a reduction of loan rates as high-risk business did not find it worth to change banks and hence the average credit quality of business seeking a new bank was increasing. There will, however, be a point where these businesses have all been crowded out of the market and it is then that the increasing costs affect only low-risk businesses. The increasing costs to businesses of providing all the evidence needed would increase the market power of banks and they would be able to exploit this by increasing loan rates. Business could not react to such increases by changing to another bank as the costs of this change will outweigh the savings from a lower loan rate.*
Model(s) used: Ch. 11.1.3

Problem 120

Dara Som owns, with some family members, Som's Pleasure Travel Co., Ltd., a company organising and conducting tourist tours of the main archeological sites in Cambodia. Having relied on short-term loans in the past, mainly to finance the purchase of second-hand minibuses, Dara Som found that loan rates tended to increase significantly when seeking to extend them without being able to obtain a better rate at other banks. The last loan was initially provided at a loan rate of 12.75% p.a., which then increased to 15.5% p.a., even though the company performed better than expected. She has now agreed a new loan with another bank that she says gives the company more financial stability by agreeing a long-term loan at an initial loan rate of 16% p.a., which will reduce in the future to 11.5% p.a. if the company meets certain targets and will otherwise increase to 18% p.a. She is heavily criticised by her uncle, a minority owner of the company, but influential in her family. He says that this loan is worse than what they had before, because now they pay even more start with and what happens afterwards is not really clear, they might pay the same as before or less. Dara Som argues that the overall costs of the loan are the same, but it gives the company a more stable profit.

Is Dara Som right in her assertion that the new loan is not more expensive than the loan the company had previously?

Indicative answer: *Assuming that banks are competitive, the overall costs will be the same. The higher costs in the first phase are offset against the potentially lower costs in the long run. The long-term contract allows banks to spread the profits they generate from the loans over the entire time period as they know Som's Pleasure Travel*

Co., Ltd. will not change banks, while previously they might have changed banks, so banks sought to attract them and then once they had gathered the information would exploit their informational advantage and increase the loan rate. With a long-term contract this is not necessary and they can charge loan rates that are consistent with the risks the company faces.
Model(s) used: Ch. 11.1.4

Problem 121

The company of Santiago Ruiz has received an offer to renew its loans at a rate of 10.6% p.a. after a few years of successful expansion and generating consistent profits. He is surprised that his loan rate has actually increased from 8.8% p.a., even though he believes the company is in much better shape now than it used to be. Seeking advice from a business consultant Santiago Ruiz knows socially, he learns of another company who used to be similar to his company but now is in a much worse position and their loan rate has increased from 10% p.a. to also 10.6% p.a. Ordering another round of drinks, he resigns to the increase in loan rates by remarking that banks just do whatever they do.

Is there a reason for these two changes of loan rates to be so different?

Indicative answer: *Santiago Ruiz's company sees an increase in his loan rate as now the bank knows, through their work with him, that his company is low risk, but this will not be known to other banks. If he were to change banks and the take up the offer of another bank, this bank would believe him to be a high-risk company as these are the types of companies changing banks. The current bank knows this and can charge a higher loan rate as the loan rate offered by other banks will be based on their assumption of a high-risk borrower. The other company that was mentioned is actually high-risk, but they might have a long-term contract with their bank and thus did not receive such an attractive initial loan rate, as evidenced by the higher loan rate this company had to pay. The loan rate of 10.6% reflects the true risks of that company, while for Santiago Ruiz's company it is a loan rate that allows the bank to recover the losses or increase the low profits made from the low initial loan rate.*
Model(s) used: Ch. 11.1.4

Problem 122

Banks were required to facilitate individual customers changing their bank by automatically informing all companies using direct debits to obtain payment for services, provide the new bank with information about any standing orders a customer might have, and provide information on any other existing financial arrangements such as credit cards, overdrafts, and account packages that may include insurance arrangements. On opening an account the new bank was required to process all the available information and through an interview with the new customer establish his or her identity, make extensive checks about any association with criminal activities, including the evaluation of social media, and gain a full and detailed understanding of the financial position of their new customer as well as his or her familiarity with managing financial matters. A new government in its desire to deregulate the economy and lower the costs of loans through increased competition, has abolished all but the most basic checks on the identity of new customers. Consumer groups had warned that abolishing these rules would reduce the competitiveness of the banking market, while banks welcomed the reduction in costs. After the implementation of these changes, loan rates have barely changed.

How come that competition between banks has not reduced loan rates?

Indicative answer: *We have two effects at work here, one is the increase in costs to customers switching banks as now they have to perform all the tasks that their original bank did for themselves. The second effect is the reduction in costs of banks acquiring new customers as the requirements are now much lower. The latter effect should increase competition and hence reduce loan rates. The reason is that the costs of banks to obtain a new customer is reduced and loan rates can now be more attractive to attract new customers. It must clearly be that this effect is offset by the first effect. The increase in costs to switch banks makes customers less willing to do so, giving banks additional market power and thus loan rates will increase; the size of this increase must be approximately the same as the reduction from lower bank costs. The costs for customers must be substantial such that only low-risk customers switch banks to benefit from a lower loan rate at another bank as otherwise the loan rate would decrease in this instance as well.*
Model(s) used: Chs. 11.1.1, 11.1.3

Problem 123

Grumpy old men and inexperienced young hipsters are in Rimantas Navickas' list of most difficult to deal with and engage constructively with to establish lasting business relationships. He finds either group of managers to be not interested in engaging constructively with his bank to develop mutual trust and allow the bank to learn their strengths and weaknesses to allow him to provide meaningful advice. It is the middle-aged group that is most amenable to such an approach. Discussing with his manager the reason for this, he only receives a 'it has always been like that' as an answer.

What could be the reason for this observation?

Indicative answer: *We can reasonably assume that young and inexperienced managers rarely have high skills to manage a company, while for older managers this should be common, given they have retained their jobs for such a long time. In both*

cases there is not much benefit engaging in relationship banking as the bank will not learn much more about the qualities of these managers, the young being mostly low-skilled and the old being mostly high-skilled. Thus the loan conditions of the bank on learning more about these managers and the companies they are leading will not materially change. It is only that banks have higher costs to obtain this information, which will be reflected in a higher loan rate without discernable benefits. Middle-aged managers, however, will be a mix of high-skilled and low-skilled managers, some having learnt from their early years, other not having made much progress. Here the benefits can be substantial as being known to have high skills will lower the loan rate, outweighing the effect the increased costs of the bank will have. As long as managers are uncertain of their own type, they will be engaging in relationship banking and, on average, benefit from the lower uncertainty banks have about their type.
Model(s) used: Ch. 11.2.1

Problem 124

A report on banking practices of companies also touches on the aspect of relationship banking. It outlines that family-run firms are usually having long-established relationships with their banks, while companies of similar size and characteristics that are run by professional managers are much more often foregoing lasting relationships with banks and seeking the best conditions for each loan in the market. Before its publication, it seeks to establish reason for this observation and asks you to write a brief paragraph explaining it.

What would you write?

Indicative answer: *Family-run business recruit senior managers, as the name suggests, from members of the family owning the company. The main criterion for being installed in a senior position will be being part of the family, with competence often being a secondary criterion. Of course, there will be many very able managers in this group, but also many less able managers, who would normally not have been appointed to such a position. It is of benefit in this case to establish a relationship with a bank and for the bank to learn the qualities of the management; this reduces the uncertainty of the bank about the risks the company faces and will therefore allow it to provide loans at more favourable conditions if the management is capable. On the other hand, if a company hires a professional manager, it is reasonable to assume that the main criterion will be the competence of the manager and the best manager will be appointed. It is thus expected that the skills of a manager appointed this way to be competent. There is therefore not much for the bank to learn about the qualities of the manager and the costs of acquiring this information in relationship banking will outweigh the benefits to the company. It is therefore that such companies are much more likely to forego relationship banking in favour of transaction banking.*
Model(s) used: Ch. 11.2.1

Problem 125

A credit analyst reveals his easy test to establish if a company is creditworthy at all, before conducting a more detailed analysis of the risks of companies that have passed his test. He looks at the history of bank lending of the company; if he sees that they have switched banks frequently in the last few years, he classifies them as not being not creditworthy.

Why does a frequent change of bank lenders indicate that a company might not be creditworthy?

Indicative answer: *Banks will learn over time more about the risks of the companies they lend to, relationship banking, and this additional information might induce them to not extend loans to companies they see as too high risk for the loan rates they usually charge. Banks might be reluctant to increase the loan rate significantly for higher-risk borrowers as this might be seen as the bank willing to take on high risks, which depositors might prefer them not to take, or they might face capital constraints. Such a company will then have to seek another bank to provide them with a loan and the same process begins again; the new bank might even have inferred the company to be of higher risk, but then on learning its true riskiness, it might be higher than anticipated and as before the loan is yet again not extended and the company has to seek another bank. Thus frequent changes of the bank lender either indicate a high risk or that the risk of a company is increasing over time. It is thus that after a number of such changes, many banks would classify such companies at not longer creditworthy. In that case, a detailed risk analysis is not cost-effective as the costs of the analysis cannot be recovered from a loan that will not be granted.*
Model(s) used: Ch. 11.2.2

Problem 126

Increasing competition has brought Vargas plc into significant financial difficulties, which is not yet widely known in the market as the threshold for disclosure to the market has not been reached yet. It is, however, apparent to their house bank, Global Trust Bank. Their current loan arrangement with their bank stipulates that they are given a loan for five years at a rate of 6.8% p.a., but either Global Trust Bank or Vargas plc can terminate the agreement with 3 months notice; Global Trust Bank has done exactly that. They are, however, willing to extend a new loan at 8.5% for a duration of three months. The management at Vargas plc is upset about this step by the bank and see it as pure profiteering by the bank.

How can you explain this decision by Global Trust Bank?

Indicative answer: *Global Trust Bank knows the financial difficulties Vargas plc is in, hence they know that the risks of the company are high. Knowing these high risks, the loan is no longer profitable and they exercise their right to call in the loan. However, the company is still creditworthy, although this requires a higher loan rate. If Vargas plc were to approach another bank, they would infer from the fact that they seek another bank that Vargas plc is high-risk and therefore charge a higher loan rate. Thus the Global Trust Bank and other bank would have comparable information and for this reason, Global Trust Bank is offering them another loan at the now prevalent market conditions. This call-in of the loan is only possible because of the privileged information Global Trust Bank has access to, arising from their existing lending relationship with Vargas plc. Without this knowledge, they would not seek the repayment of the loan.*
Model(s) used: Ch. 11.2.2

Problem 127

Flannigan Ltd. is a major chain of car repair workshops all across the midwest USA. It has been hugely successful for a long period of time, but its fortunes have turned after concerns about the quality of their repairs became public and they were found to have sourced counterfeit replacement parts, even though it is widely acknowledged that this was done inadvertently. With revenue reducing by over a third in the three months period following these revelations, Flannigan Ltd. struggles to service the loans that underpinned much of the purchases of equipments used in their repair shops. Their bank, Midwest Old State Bank, having financed their operations for over ten years, is no longer willing to extend the loans at the current conditions and asks for their immediate repayment or to re-negotiate its terms. This move is welcomed by the newly appointed management of Flannigan Ltd., which has replaced Jason Flannigan, who stepped down in light of the difficulties of the company. Acknowledging and shortly afterwards making public the financial difficulties, the new managers at Flannigan Ltd. refuse to negotiate new loan terms exclusively with Midwest Old State Bank and avoid their financial difficulties become more widely known, but instead they contact a range of banks to obtain the best loan conditions. Jason Flannigan is overwhelmed by these developments and does not understand why Midwest Old State Bank would not extend the loans at the current loan rates as they have always done and he understands even less why the new management seeks to break off the long-standing relationship with Midwest Old State Bank.

What could reasons for these changes be?

Indicative answer: *The risks of Flannigan Ltd. have increased considerably and Midwest Old State Bank will have become aware of that. The risks have become so high that the currently agreed loan rate is not longer profitable for Midwest Old State Bank and they therefore seek the repayment of the loan, but might be willing to re-negotiate a higher loan rate, taking these higher risks into account. Their approach*

of other banks will increase the costs of the new loan, as Midwest Old State Bank will face less competition if the financial difficulties of Flannigan Ltd. are known and thus other banks will also demand higher loan rates. While it would be detrimental to the loan rate, the new management sees benefits from terminating the relationship with Midwest Old State Bank and seeking loans from the bank offering the best terms, transaction banking. The costs of these new banks in acquiring additional information will be lower and they believe that this will reduce the overall loan costs. This might be driven by the believe that them, having been appointed by the owner-manager as professional managers will leave little doubt about their ability and thus will re-assure banks of the risks they are taking, something they could not be so sure with the previous manager, Jason Flannigan.
Model(s) used: Chs. 11.2.2, 11.2.2

Problem 128

AILogic Ltd. has been developing tools that help developers improve the performance of artificial intelligence applications. They have frequently relied on short-term loans to overcome cash shortages that arose if they needed to pay their developers before payments from their customers were obtained. Seeking to keep costs down, AILogic Ltd. has always scoured the market for the best conditions at the time and taken the most favourable loan, regardless who did offer it. Since they required a loan last two years ago, the banking market has changed through the entry of a number of new banks, some newly founded and some backed by banks in other countries. Seeking offers for loans again, they observe that most banks refuse to provide a quote and state that they are only interested in long-term business relationships with companies and do not provide ad hoc loans.

What caused this change in the ability of AILogic Ltd. to obtain a loan by seeking out the best conditions?

Indicative answer: *The new entrants to the banking market will have increased competition between banks, making it more difficult for banks to generate profits from transaction banking. Banks will therefore have shifted their focus towards relationship banking in markets where significant informational gains can be expected over time. It is likely that this is the case for a business like AILogic Ltd., where public information will be sparse and an understanding of the business within banks will be limited. Hence banks will focus their resources on companies that will stay with them for longer periods of time, and the indication from the past behaviour of AILogic Ltd. is that they will not commit to building such a relationship, hence they are turned down for a loan.*
Model(s) used: Ch. 11.3.1

Problem 129

Rossmann Hydro Ltd. is in financial difficulties arising from large compensation costs after a hydroelectric dam they operate has caused damage to surrounding properties due to an increasing water table that required costly mitigation measures to avoid future damage. The company is financed to a large extent by loans granted by a consortium of banks, insurance companies and pension funds. To allow Rossmann Hydro Ltd. implementing the mitigation measures, additional loans are required and knowing that the exposure of the existing lenders to their company is already high, they approached a variety of banks, who all declined a loan. When approaching their existing lenders, lengthy negotiations finally resulted in a loan being agreed, although its size was less than what was required, making the implementation of mitigation measures only possible if stretched over a longer time period.

Why would existing lenders provide a smaller than needed loan and new lenders are refusing to provide loans at all?

Indicative answer: *If Rossmann Hydro Ltd. were to fail, the existing lenders would make significant losses and not providing additional funding would make this scenario much more likely. If they were to provide the loan, but limiting their overall exposure by not granting the full amount requested, the existing lenders would have a reasonable chance that Rossmann Hydro Ltd. would be able to recover from its difficult position and all loans are repaid. New lenders do not have to consider their existing exposure and the risks involved were too large for them to consider lending to Rossmann Hydro Ltd.*
Model(s) used: Ch. 11.2.3

Problem 130

Farkas plc is a leading Hungarian supermarket chain, which for the past 20 years has used Csernai Bank for all its banking transactions, from cash handling, processing card payments, account services, to providing loans to finance their company. They are currently undergoing a restructuring of their business, which has become necessary after competition from budget supermarkets had reduced their profits over the years and left them with high interest payments from ever larger loans that have been used to invest into the business. In the midst of their restructuring, the central bank announces that Csernai Bank has been put into administration due to excessive losses on mortages given over a decade ago. While all stocks listed on the local stock exchange show losses after this announcement, Farkas plc shows losses far in excess of comparable companies.

These large losses in the value of their stock comes as a surprise to the senior management of Farkas plc. How could you explain this development?

Indicative answer: *Farkas plc will likely by affected in two ways. Firstly, the accumulated information on its company that Csernai Bank holds will be lost with its*

demise, or at least severely diminished as its loan officers and other decision-makers will be employed by different banks in the future. This loss of information on Farkas plc is most likely to result in higher loan rates in the future as banks first need to assess their risks and collect information. This is exacerbated by the company being in a restructuring process. It is usually banks already having an exposure in a company facing financial difficulties that will continue to provide loans in order to increase their chances of having existing loans repaid. With Csernai Bank being in that position and if it were to be liquidated, no lender with such an interest in Farkas plc exists, making it less that sufficient financial resources for the restructuring are available from new banks. The higher loan costs will reduce future profits, having a negative impact on the stock price and the less likely completion of their restructuring process will put the survival of Farkas plc even more at risk, also negatively affecting the stock price.
Model(s) used: Chs. 11.1.2, 11.2.3

Problem 131

Water & Fun Ltd. operates two water parks in the countryside. The availability of cheap flights to warmer holiday destinations has led to a reduction in footfall in recent years. To stem this loss of revenue, Water & Fun Ltd. have invested heavily into their water parks and installed ever more sophisticated water slides, wave machines, and much more. This was mostly financed through loans, but they are now at a point where after a few weeks of cold and rainy weather, they will not be able to make payments on their loans. The owners of Water & Fun Ltd., Peter and Harriet Pentos, are, however, convinced that their latest idea to provide heated water for many of the attractions will make the water park attractive again to customers, even if the weather is not favourable. After their bank had turned them down initially, they have finally been successful in convincing their bank to provide a loan. However, the loan is much smaller than they had envisioned and would only allow them to equip some attractions with warm water. At the same time the bank has made it a condition that the current loans, whose terms are fixed for another three years are adjusted to account for the high risks that Water & Fun Ltd. now poses to them. Alternatively, they said they are happy for them to seek another lender.

Why would the bank grant a (small) loan and then seek to renegotiate the terms of the existing loans?

Indicative answer: *The advancement of the new loan can be seen as evergreening as in effect Water & Fun Ltd. is bankrupt, their bank seek to reduce their losses by keeping the water park going for a few more years until at least some of the existing loans can be repaid. The renegotiating of the existing loans can be seen as an adjustment to reflect the current risk of the company as the current terms of the loans are not covering these risks. The bank might have the hope that another bank steps in and provides a loan that allows them to obtain instant repayment. The bank*

seems to employ a carrot (evergreening loan) and stick (encouraging them to find another lender) approach, seeking to maximize the repayments from the loan.
Model(s) used: Chs. 11.2.2, 11.2.3

Problem 132

Ingólfsson Framkvæmdir ehf is a construction company that faces financial difficulties after a publicly funded housebuilding programme is wound down. They owe their bank ISK500m and to stay afloat request an additional loan of ISK250m, which they think will carry them over the current slump in construction until the demand normalises itself again. The bank refuses their request. The management of Ingólfsson Framkvæmdir ehf points out that it was seven years ago when they owed ISK800m, that the same bank granted them a loan of ISK300m, so much more was at stake for the bank and no other bank would consider a loan. They argue that the situation back then was similar in that a sharp recession had caused demand for construction to plummet. The bank, however, steadfastly refuses to advance another loan. The management attributes the bank's refusal to them losing faith in the ability of the management to turn the company around again.

Is there another reason for these different decisions of the bank?

Indicative answer: *The decision of the bank seven years ago to provide Ingólfsson Framkvæmdir ehf with a loan can be interpreted as evergreening as no other bank was willing provide a loan; the size of the loan, was less than 40% of the outstanding loan and the bank granted this loan to avoid default on the much larger existing loan of ISK800m, hoping that the additional loan would allow the management to turn around the company. This time, while the absolute amounts of loans involved are smaller, the new loan would be 50% of the outstanding loan, so be relatively larger. It is here that the size of the loan required this time is too large for the bank to engage in evergreening, the potential loss from the additional loan would outweigh the loss on the existing loan. It is therefore that the now required loan is not paid and not because they assess the ability of the management or the prospects of the company materially different.*
Model(s) used: Ch. 11.2.3

Problem 133

The conglomerate Sengupta Ltd. operates a number of production facilities in the developing country of Tanatora, financing its operation through local banks. The banking system in Tanatora is not very robust with periodic bank panics and lending freezes in response. Its new Chief Executive has joined from Arendal plc, a comparable conglomerate in Europe. On taking up his role and familiarising himself with the details of Sengupta Ltd.'s operations and practices, he is surprised to learn that the company regularly deals with and maintains close relationships with six banks. At Arendal plc he was used to having to deal with only three banks. One of his first questions is therefore, whether the relationships with six banks should be reduced.

How would the Chief Financial Officer argue to maintain the status quo?

Indicative answer: *The banking system of Tanatora is less stable than that in Europe, as evidenced by bank panics and lending freezes. This may lead to a situation where Sengupta Ltd. cannot obtain a loan from a bank if it needs one, resulting in lost investment opportunities. Such a situation is much less likely to occur in Europe. It is therefore that Sengupta Ltd. maintains more relationships than they would need in a more stable banking system, allowing them to fall back on another bank not applying a lending freeze. Given the high probability of a single bank applying lending freezes, it is optimal retain a larger number of relationships to avoid the more costly loan from an unknown bank.*
Model(s) used: Ch. 11.2.4

Problem 134

As a trial supported by the banking regulator, banks operating in the federal state of Parman are trialling the mandatory sharing of information about business customers across banks. As part of the trial, all banks share all information they hold on a company with a database to which other banks have access; the information provided includes all loans a company has, its transactions in accounts, notes from meetings with the company, internal documents and analyses of the bank, as well as information shared by the company. The evaluation of the trial looks at many of the practical and technological problems with the sharing of information, but also seeks feedback from companies.

Focussing on the relationship with banks, how would you expect companies to respond?

Indicative answer: *The feedback by companies will be mixed, with low-risk companies welcoming open banking, while high-risk companies will see it much more critically. Open banking favours low-risk companies as their status becomes more apparent to other banks and will thus lower their loan rate as competition between banks for their business increases. On the other hand, high-risk companies will see the sharing of their negative information more critically as their status is high-risk companies is much more easily confirmed and they would prefer to retain some ambiguity about their risks to obtain a better loan rate. However, the provision of information will also make switching banks easier as companies do not need to provide that much information, saving time and effort. If the costs of switching become very low, this might actually increase the loan rate for ;low-risk companies, who will see a downside to the benefits of open banking. The low costs make it feasible also for high-risk companies to switch banks, increasing the loan rates banks other than*

their relationship bank offers and consequently allowing their own bank to charge them higher loan rates.
Model(s) used: Chs. 11.1.3, 13

Problem 135

The owner of a large chain of coffee shops, Raffaello Pizzibaldi, finances his shops through two different banks. The nature of his business requires the location of each shop to be considered carefully and while he has an instinctive feeling whether a location is right, discussing this with his banks is difficult as they often request market studies and demographic analyses, which he never uses. Banks find it difficult to make decisions on financing a new shop or the renovation of an existing shop based on his instincts, resulting in lengthy meetings and discussions, which surely are as exhausting for his bankers than they are for him. On several occasions both banks refused a loan, doubting his analysis, which Raffaello Pizzibaldi believes has lost him quite some money. In contrast to this, the owners of a number of restaurants that are located next to his coffee shops in several locations, a private equity firm, has relationships with seven banks and among these seven banks there is always one who agrees to provide the finance sought, even though they get often turned down by at least on of their banks. He attributes this difference in attracting funding to their very formal approach to making decisions, based on detailed market research by outside consultants and similar documents.

Should Raffaello Pizzibaldi increase the number of banks he is dealing with, like the restaurant owners?

Indicative answer: *The way Raffaello Pizzibaldi conducts his business is very informal and for banks to assess his 'gut feeling' is very difficult, hence the lengthy discussions. Such discussions are costly for the bank as they require a substantial amount of time, which banks will have to recover through the loan rate, making loans more costly. If he were to deal with more banks, each bank would incur these costs, but their share of the loans would reduce, increasing the loan rate further. While having more banks would increase the chances of obtaining a loan as banks might differ in their assessment, these aspects have to be weighed up . It would therefore most likely not be optimal to increase the number of bank Raffaello Pizzibaldi deals with. The restaurant owner have a very different approach to their decision-making and provide structured documents to their banks, making the costs to banks of reaching a decision much lower. Thus they can easily use more banks without increasing loan costs too much and benefit from the higher chance of a loan being provided.*
Model(s) used: Ch. 11.2.4

Problem 136

A report to government on the competitiveness of the economy highlights that a significant fraction of companies and individuals use the same bank over long time periods, typically many years, a degree of loyalty that is much less common in other industries. It is suggested that the lack of competition between banks is harming the economy overall and keeps loan rates artificially high. In response, the government seeks to introduce measures to increase competition in the banking sector, from encouraging new entrants to reducing regulatory constraints. While most economists support the measures to increase competition between banks, some dissenting economists assert that such measures would not only fail to address the problem, but actually make the situation worse.

How would dissenting economists argue their case?

Indicative answer: *If competition between banks were to increase, banks would ordinarily make less profits. They will, however, seek to find sources of profits and this source can come from having an informational advantage over other bank. Such an informational advantage can be obtained through relationship banking by investing into gathering information on customers and offering them tailored products that meet their needs better, but also exploit the fact that because other banks do not hold this information and can thus compete less. The increase in competition will make relationship more widespread and most likely more companies and individuals will be captured. With increased competition relationship banking will be extended to companies and individuals about who there is less uncertainty.*
Model(s) used: Ch. 11.3.1

Problem 137

The advent of internet banking has made it easy to access bank services at banks that are not even operating locally. With more and more banks extending such online services to companies seeking loans, competition between banks has increased significantly. At the start of the process many bankers saw this development critically, not because of reducing profits for banks, but they in particular bemoaned that this would bring the end to traditional relationship banking. However, these concerns were unfounded. There is no evidence that relationship banking has become less important, although the nature of such relationships has changed with online interactions between banks and their customers becoming more and more important; overall it seems to play an as important role as ever.

Why have the concerns of the bankers on the demise of relationship banking not materialised?

Indicative answer: *Competition has two competing effects on relationship banking. On the one hand there are reduced profits from competing banks offering better conditions than before and forcing each bank to improve their offerings. These*

reduced profits have reduced the returns on relationship banking and will therefore have reduced the relevance of relationship banking for banks, leading to its reduction. There is, however, a second effect and that is that the informational advantage that relationship banking gives a bank cannot be eroded through competition as other banks do not have this information. It is therefore that in order to maintain profits, banks will seek to rely more on this informational advantage and relationship banking becomes more important as a source of profits and will be extended. It seems now that these two effects have approximately offset each other and relationship banking has maintained its status.
Model(s) used: Chs. 11.3.1, 11.3.2

Problem 138

After a prolonged period of economic growth, the small country of Matara, acting as a regional trading hub due to its location at a major shipping route, has become attractive to banks seeking to provide services to the companies operating in Matara and other countries nearby. The banking sector, not many years ago described as uncompetitive and sluggish, has become highly competitive and innovative with the advent of major foreign banks. Many, although not all, of the traditional traders located in Matara welcome the increased prosperity and appreciate the lower funding costs due to the competition between banks. However, at the same time they miss the close relationship they had with their banks, who would know their business well. Now traders need to explain even the basics of their business to banks if need a loan.

How can this development be explained?

Indicative answer: *Relationship banking in Matara has reduced due to the increased competition. More competition between banks has reduced loan rates and hence profits of banks. These lowered profits reduced the return from relationship banking, where consequently they invested less into relationship banking and consequently less companies were involved, leading to banks not routinely seeking and retaining information that is reused in the future; instead traders have to explain their business to the bank every time they require a loan.*
Model(s) used: Ch. 11.3.2

Problem 139

In order to promote economic growth during a recession, the government decides to offer guarantees to banks selling their loans to investors outside of the financial sector; these guarantees are offered at below market prices. The government is disappointed that banks have hardly taken up the offer and the amount of loans sold has actually reduced compared to periods before the guarantee was introduced.

How can you explain this observation?

Indicative answer: *The loan guarantee the government offers is not taken up as the price they request, the market price for such a guarantee is too high, giving the bank no benefit from this scheme of the government. The securitisation itself has reduced as the risks of the companies are most likely have increased due to the recession the country is in. In this case the credit enhancement offered by the bank, the guarantee the bank offers to purchasers of the loans, has to increase. Given that bank have limited equity to cover these guarantees, the amount that can be guaranteed will reduced, reducing the amount of loans that can be securitised.*
Model(s) used: Chs. 9.5, 13

Problem 140

After reforms giving banks full freedom to decide on who to provide loans to, rather than having to meet minimum quotas for certain industries, and allowing banks to operate freely nationwide, loan rates have considerably reduced and lending has been expanded to the point where for many banks capital requirements become a binding constraint on their ability to provide additional loans. Banks are now competing much more openly for customers and seeking minimal information from potential borrowers to make a decision, also not giving more detailed consideration to long-standing customers. At the same time, customers would prefer their banks to understand their business better and have increased the number of banks they are sharing their information with. Eszter Nagy, as owner of Nagy Ipar Kft., is one of those who now uses four banks rather than only two before the reforms. She says that she does so as a result of banks having ever less interest in obtaining detailed information.

Is her rationale correct?

Indicative answer: *The reforms have increased competition between banks which is evidenced by the reduced loan rates; this higher competition seems to have reduced the investment by banks into relationship banking. The reason is that the better conditions from other banks does not so easily allow a bank to recover the costs of collecting information about companies, reducing their investment into this process. This effect is stronger than the desire to maintain their profitability through informational advantages over their competitors. However, this is not the reason for customers such as Nagy Ipar Kft. seeking relationships with more banks than before. The reason can be found in the observation that lending has increased considerably and banks might be unable to provide a loan to a customers because it has met its capital constraint. To hedge against the risk of not being able to obtain a loan for this reason, companies seek more relationships such that at least one of their banks does not face a lending constraint.*
Model(s) used: Chs. 11.2.4, 11.3.1, 11.3.2

Problem sets for Part III

Problem 141

Garabito is dominated by two banks, which share the market for loans as well as deposits about equally and their characteristics are very similar. An economic crisis, brought on by the fall in the global market price for agricultural products, has increased the losses from loans to both banks. One bank, First Garabito Bank, is facing a bank run as depositors fear the safety of their deposits in light of the losses the bank has accumulated on its loans. The other bank, National Garabito Bank, does not experience a bank run. Experts at the central bank are unable to explain this observation as they can see no difference between the banks, losses are similar in both banks and even the characteristics of depositors are nearly identical.

Can you offer an explanation?

Indicative answer: *Depositors will withdraw their deposits if they believe they are not safe, that is by retaining them in the bank they will make a loss due to the losses of the bank from loans and the withdrawal of other depositors, reducing the cash reserve and increasing the losses of the bank through the forced sale of asset below their value. Future withdrawals of deposits cannot be observed but expectations must be formed. These expectations might differ between the two banks and can be crucial in a bank run being instigated. If the losses of banks are small, the banks will always be able to meet the demand of depositors by selling assets, even if they all withdraw; similarly if the losses are sufficiently high, losses will be too high to be able to meet the demands of all depositors, even if no deposits are withdrawn. In these cases a bank run would not (would) occur. There is an intermediate range of losses, however, where remaining depositors face a loss only if a sufficiently large number of depositors withdraws as in this case the accumulation of losses from loans and the sale of assets are large enough. If only few depositors were to withdraw, there are no losses for remaining depositors. In the case of Garabito, it seems that the expectations at First Garabito Bank are such that a large fraction of deposits will be withdrawn, while at National Garabito Bank this expectation is low and no bank run occurs. With expectations becoming self-fulfilling, and involving n^{th}-level reasoning*

about the behaviour of other depositors, minute differences between depositors might cause such different outcomes.
Model(s) used: Ch. 15.1.2

Problem 142

The banking system of Badenia is under significant stress. After the collapse of a large regional bank, depositors have been concerned about their bank failing and have been withdrawing deposits in large quantities, demanding cash or transferring their deposits overseas. Thus far the central bank has provided liquidity assistance to the banks affected, but the deposit withdrawals have not subsided despite assurances to the public that other banks are not affected in the same way as the regional bank and are safe. Prior to the recent events, the banks in Badenia were renowned for their conservative lending policy and have been criticised often for not taking sufficient risks. Foreign banks, hedge funds, insurance companies and pension funds observe the events in Badenia and see a good opportunity to purchase high-quality loans these banks have provided at a discount. The widespread interest in these loans makes discounts to their true value small, limiting the profits of these foreign buyers. While initially the purchase of loans by foreigners is seen negatively, once the discussion about these purchases becomes more widespread, deposit withdrawals stop as suddenly as they began.

Politicians explain this development with the desire of the population to prevent a foreign takeover of their banks. Are they correct?

Indicative answer: *The relatively high prices foreign buyers pay for the assets of banks, the loans, results in banks being able to generate cash easily, allowing them to repay deposits that are withdrawn without negatively affecting the claims of deposits retained with banks. This increases how much withdrawals are needed before remaining depositors make a loss, changing the overall expectations of depositors. If their expectations about deposit withdrawals falls below the critical threshold, the bank run stops and the banking system will stabilise. It is therefore not the patriotism of depositors that stopped the bank run, but the increased liquidity of assets increasing the threshold for expectations of banks runs, which was not exceeded any more.*
Model(s) used: Ch. 15.1.1

Problem 143

Northern Bank is known to provide loans to low-income households and newly established businesses, in line with its mission as a mutual bank to provide support for individuals and companies who find it difficult to access banking services and loans elsewhere. It also prides itself for offering deposit rates that are significantly higher than its more traditional competitors. Despite offering higher deposit rates, Northern Bank struggles to attract the amount of deposits required to sustain its lending.

Why does the higher deposit rate make Northern Bank not more attractive to depositors?

Indicative answer: *The risks Northern Bank takes is higher than that of other banks as they focus on loans that are less likely to be repaid due to the nature of their borrowers. This risk the bank takes, which will jeopardise their ability to repay deposits, has to be reflected in the deposit rate they offer. The struggle to attract deposits suggests that the offered deposit rate, while higher than that of other banks, is not sufficient to compensate fully for the risks involved.*
Model(s) used: Ch. 14.1

Problem 144

The companies obtaining loans from Oppermann Bank are known to be innovative, but unpredictable in their ability to repay loans. At times, companies turn out to be very successful and pose no meaningful credit risk, while at other times they severely struggle to maintain the payments on their loans. Oppermann Bank offers its depositors a deposit rate of only 2% p.a., but promises them a bonus if the bank is performing particularly well. In contrast to that, Targin Bank offers a higher deposit rate of 3.5% p.a., with comparable bonus arrangements. The borrowers of Targin Bank are all well known to the bank and they can well evaluate their credit risk. Despite this, the deposits of Targin Bank are not recommended for depositors seeking safety, while deposits at Oppermann Bank are.

How can you explain these recommendations?

Indicative answer: *The uncertainty at Oppermann Bank is such that the bank and depositors find it difficult to assess whether the loans provided are low-risk or high-risk. To account for this, Oppermann Bank offers a low deposit rate that they can be sure to repay in the worst-case scenario and then offer the bonus if they obtain higher repayments, thus deposits are agreed to be paid the stated interest and deemed safe; this is optimal as the difference between times where loan risks are high and low are substantial. In contrast to that, Targin bank offers a deposit rate that they might not be able to repay, hence the deposits are risky. As the bank knows the credit risk of their borrowers well, there is little uncertainty about the risks involved. In this case, the risks to depositors are known and they are adequately compensated for this risk, willing to take the risky deposits.*
Model(s) used: Ch. 14.2

Problem 145

You observe that in times of high uncertainty, such as recessions and major technological innovations, deposit rates offered by banks are low once adjusted for risks, but depositors rarely make losses. In contrast to that, during stable times with predictable risks, deposit rates are higher, again once adjusted for risk, but also some banks failed to meet their obligations. You are puzzled that deposits are safer in times of economic change than in more stable times.

How can you explain this observation?

Indicative answer: *If the uncertainty about the prospects of companies is high, banks will find it difficult to assess the credit risk associated with loans and these prospects will differ widely between companies. This makes it optimal for banks to offer safe deposits in that they provide terms they are certain to be able to meet, requiring a low deposit rate aligned with loans being high-risk. In calmer times, the return on loans will be much more predictable and banks will be more aggressive in their offers, promising higher returns; however, on some occasions, higher default rates on loans do not allow the banks to make the full payment they promised.*
Model(s) used: Ch. 14.2

Problem 146

For a long time, Foreman Bank has offered basic bank accounts only, keeping its costs down; for the same reason they have also not joined the deposit insurance scheme offered by a regulator for a fee. Their accounts offered only basic payments between accounts and the use of the bank's own cash machines. In order to expand their market, they consider offering more services to their customers, such as travel money, access to cash machines worldwide, preferential interest rates in loans for existing account holders. While these additional services are costly, they hope customers find them attractive and they can lower the deposit rate to retain their profitability. The management consultants hired to assess these plans, agree that the costs of the services could roughly be offset by lower deposit rates, but they do not expect an increase in profitability from this measure alone.

What can the management consultants suggest to increase the profitability of Foreman Bank?

Indicative answer: *The management consultants could suggest that Foreman Bank joins the deposit insurance scheme. While this will incur additional costs, the risks to depositors would reduce, allowing Foreman Bank to lower the deposit rate even further, recovering these costs. However, even more, by eliminating the risk to depositors, they can be assured to benefit fully from the added services, rather than only in case the abnk does not fail. This will further increase the benefits to the added services to depositors, allowing the bank to lower deposit rates even further*

and generate additional profits.
Model(s) used: Ch. 14.3

Problem 147

Abdo Saleh compares banks to open an account with and deposit his savings. He is surprised to see that the largest banks offer the lowest deposit rates, while smaller banks often offer better conditions. In his view it is obvious to choose the bank that offers the highest deposit rate, as long as it gives him an acceptable level of general service. His friend advises him that the different deposit rates might be related to different risks banks take, and hence if the deposit rate is high, this would probably imply that the bank is also more risky. While he sees this point, he is still baffled that large banks pay the lowest deposit rates.

How can his friend explain this finding?

Indicative answer: *Banks taking lower risks will be more attractive to depositors, given the same deposit rate. Therefore, banks providing high-risk loans will have to increase the deposit rate to remain attractive to depositors. However, unless they can increase the loan rate to the same extent to compensate for these higher costs, they will reduce their profits. Thus high-risk banks will have to trade off increasing deposit rates and thus lowering profits, against the market share, increasing profits. This trade-off is such that high-risk banks concentrate on those depositors that value their services most, while low-risk banks seek a larger market share and appeal to a wider range of depositors.*
Model(s) used: Ch. 14.4

Problem 148

The mountainous country of Naril is segmented into three regions, all separated by high mountain ranges and connected only through poorly maintained roads. The economy is developing separately in each of the three regions, with their own foci on agriculture, tourism, and technology, respectively. While there is only one bank that operates in all three regions, called Naril Bank, each region has their own small number of banks that only operate locally. The policy of Naril Bank is to grant loans only to companies that are well-established and whose business is financially sound. The policies of the local banks vary, however; those in Prasala, whose economy is mostly driven by agriculture, are only willing to provide loans to companies that are very safe and can provide collateral. This is in contrast to banks in Merkano, whose technology firms are highly innovative and thus banks are taking significantly higher risks when providing loans. The tourism sector in Serkano is well established, but subject to the usual seasonal fluctuations as well as changing international travel patterns, which is reflected in the loans banks provide. You observe that in Prasala the banking market is dominated by local banks, while Serkano sees Nasril Bank and local banks competing, and in Merkano local banks only play a minor role in the banking market. As the newly appointed Head of Strategy at Nasril Bank you are struggling to explain the different fortunes Nasril Bank has in each of the region.

Despite following the same strategy in each of the three regions, what is the reason for the different market position of Nasril Bank?

Indicative answer: *We can identify Nasril Bank as having low risk, local banks in Merkano as high risk, Serkano as intermediate risk and Prasala as very low risk. It follows from that the high risk of local banks in Merkano makes them much less attractive for depositors than the safer Nasril Bank; with few deposits attracted, they will not be able to lend a large amount and the market will be dominated by Nasril Bank. In Serkano the risks of Nasril Bank and the local banks are roughly comparable and hence they are similarly attractive, resulting in them both attracting depositors and hence being able to lend. The situation in Merkano is the opposite to that in Prasala, here the local banks are safer and will therefore be more attractive to depositors.*
Model(s) used: Ch. 14.4

Problem 149

The economy of Tanastin has very quickly developed from an agricultural society to the development of cutting-edge software solutions thanks to its well-funded education system. The very nature of the industry dominating Tanastin is that companies are mostly small and failing frequently, while new companies are set up to explore new ideas. Banks are playing an important role in financing these companies, but they are small and not attractive to depositors given the risks these banks have to take. Each bank seems to operate in a small niche market and attract a specific type of customer, some cater for the needs to young customers, others for the older generation, but much of the market is served not at all or poorly. The government establishes a deposit insurance scheme which is available to banks for a premium reflecting their risk. The government had expected that providing deposit insurance would increase competition between banks, but the situation remained unchanged with deposit insurance not being taken up by banks.

Why is the deposit insurance a failure and how would its success have increased competition?

Indicative answer: *Deposit insurance would have reduced the risks to depositors; this would have made it more attractive to depositors, even if the services provided do not appeal to them that well. The possibility to earn interest on deposits at a low or no risk would have outweighed the costs from not offering appealing account services. This would have lead to multiple banks competing for all depositors and not only a few depositors in niche markets. This deposit insurance is not taken up*

because the benefits to depositors from the accounts are not sufficiently large such that banks can recover the costs of the deposit insurance. This might be the result of only catering to niche markets and the situation might change if banks start to offer services that appeal more widely.
Model(s) used: Chs. 14.3, 14.4

Problem 150

Rural & Agricultural Bank is in competition with Morgan Bank, but their business models are very much different. While Rural & Agricultural Bank has long-established relationships with their borrowers and therefore knows them very well, some borrowers being more risky than others, their overall lending policy can only be described as conservative and safe. Morgan Bank, on the other hand, finances newly formed and innovative companies it knows relatively little about; consequently this bank is regarded taking high and at times unpredictable risks. Having such a reputation, Morgan Bank has never gained significant market share and Rural & Agricultural Bank dominates the market. Seeing the value of the funding that Morgan Bank provides, the banking regulator suggests to them that they take up their offer of a deposit insurance. A similar offer had been made to Rural & Agricultural Bank, who turned it down. Morgan Bank is initially reluctant to take up the offer as the premium payable would be substantial. It is only after the regulator initiates another, unlinked initiative to introduce minimum standards for deposit account services, that Morgan Bank agrees. Once Morgan Bank had improved the account services and taken up the deposit insurance, their market share grew quickly at the cost of the market share of Rural & Agricultural Bank. Rural & Agricultural Bank does not have to make adjustments to its account services as it already complies with the minimum requirements and despite the loss in market share does not consider taking up the deposit insurance.

How can you explain these changes observed?

Indicative answer: *There are a number of developments that lead to the final result. Firstly, Morgan Bank only takes up the deposit insurance once it had to improve the quality of its account services such that it was worth more to its depositors. This increased value, accompanied with the high risk of Morgan Bank, makes the purchase of deposit insurance beneficial as this would increase these benefits to depositors more and allow the bank to reduce its deposit rates, increasing profits despite paying for deposit insurance. The benefits to the accounts held at Rural & Agricultural Bank were already high, but this did not trigger the purchase of deposit insurance as this bank has lower risks, making the benefits of its purchase smaller and in this case clearly not outweighing the costs of its purchase. This might also be reinformed by the fact that as the companies are they are lending to are well known and hence risks are well established and hence will offer safe deposits based on the highest possible risk, while Morgan Bank has less knowledge about their borrowers*

and will offer risky deposits. The result is that from a depositor's perspective, Morgan Bank has become low-risk, similar to Rural & Agricultural Bank. This will make both banks similarly attractive to depositors and they will compete with each other; previously the high risks of Morgan Bank made it not attractive to depositors and they were only active in small markets for depositors whose exact needs they meet. As deposits are required to lend, this effect in the deposit market translates into the loan market as well.
Model(s) used: Chs. 14.2, 14.3, 14.4

Problem 151

Mid-morning Banca Loranta SpA sees a sudden surge in demand for their internet banking through apps and their website. It is not only that a larger number of customers than usual are logging in, they are transferring most of their funds to other banks; their branches and cash machines also see a higher than usual demand for cash withdrawals. Alerted to this development, the senior management of Banca Loranta SpA convenes an emergency meeting to discuss these developments. Everyone is baffled by the events and can see no reason why customers would withdraw their deposits. It is only after a while that the personal assistant of one of the managers shows them a message widely circulating on social media that is not much more than a headline and reads 'Loranta wants loans from other banks'. Confused the assembled managers look at each other and remark that it is normal to get interbank loans and they do not see the relevance of the post, especially as comments right under the post said 'Banks do this all the time, so what, it's normal', and the original poster then said 'Oh, in that case, all is fine.'. The last comment received many thousands of upvotes.

How would the assistant explain that this post is instrumental in explaining the withdrawal of deposits?

Indicative answer: *The social media post indicates that some depositors had concerns about the financial situation of Banca Loranta SpA as they probably have interpreted that obtaining loans from other banks points towards financial distress. While the comment makes it clear that this is not the case, it could have lead some depositors to believe that other depositors will withdraw their funds and this would make it rational for them to withdraw their deposits, too and a bank run emerges. It is clear this is bank run is not based on actual information, not even on inaccurate information, as the comments have been widely seen and acknowledged. It is merely the expectations of the reaction of others to the social media post that makes customers withdraw their deposits.*
Model(s) used: Ch. 15.1.1

Problem 152

After a long and deep recession, Lurberdea is on the path to recovery, and seeks to rebuild its economy. Aside from rebuilding the industrial base that has suffered multiple bankruptcies and loss of expertise due to emigration, its financial sector has also been affected with the failure of many banks. At the central bank a working group has been assembled to look into the causes of some banks failing while others have survived, even if facing capital shortages at this stage, which makes any lending on a larger scale impossible. Collecting basic data for a first rough analysis, the following observations are noted: All banks faced significant reductions in deposits as customers sought to make ends meet and some less affected transferred their funds abroad. It was banks that were generally regarded as providing the safest loans that survived, while those providing more risky loans were struggling to meet the demands of depositors to withdraw. Interestingly, some banks that were providing loans of intermediate risk were failing due to a sudden increase in deposit withdrawals, while other banks managed to survive and did not face exceptionally high deposit withdrawals. There seems to be no discernable difference between banks in this category.

How can you explain these very preliminary findings?

Indicative answer: *Low-risk banks will have loans that are highly valued and hence they can sell them at high prices, generating sufficient liquidity to repay depositors, while maintaining sufficient funds to fully repay those that do not withdraw their funds; thus these banks do not see a bank run and do not fail. Risky banks will not be able to sell their loans at high prices and thus will not be able to generate sufficient liquidity to pay off all depositors that are withdrawing and thus fail. In the intermediate-risk range, banks would be able to repay all depositors withdrawing as the funds they can generate from selling loans are sufficient and if no more depositors were to withdraw, those remaining could also be repaid; however if more depositors were to withdraw this would not be possible. It is thus a coordination problem, if depositors think others will withdraw they will withdraw too and a bank run emerges causing the bank to fail, other wise no bank run occurs and the bank does not fail. Thus some banks survived as they coordination worked in that depositors were not withdrawing more funds, while for other banks the coordination resulted in them withdrawing and the bank failing.*
Model(s) used: Ch. 15.1.2

Problem 153

With weak supervision of banks, the trust of depositors in their viability is low. It is therefore not uncommon to see that bank runs occur due to unfounded rumours or simple herd mentality of depositors at a bank, although they are usually isolated events that affect a single bank only. Over time you observe that some banks react quickly to any rumours emerging and generate additional liquidity even if a bank run is not certain to occur; these banks generally survive the developing bank run. Other banks, however, do not seek to obtain additional liquidity until they experience the bank run; these bank subsequently fail.

Is it correct to attribute the failure of banks to their unwillingness to react promptly to rumours and generate liquidity?

Indicative answer: *Those bank that ultimately fail, would also fail if they were to raise liquidity promptly. The observed correlation between the prompt reaction to a potential bank run and the failure of the bank in a bank run has its origin in the ability to withstand a liquidity shock in any case. Banks whose asset values are sufficiently high such that they can survive the deposit withdrawal will find it beneficial to preempt any bank run and generate liquidity by selling assets. The limited liability of banks makes this approach not beneficial for banks that would not be able to survive a bank run; hence these banks would not incur losses by selling assets to preempt such a bank run as there are no benefits for them, given they will fail if it materialises. Hence, we see only banks that would survive take preemptive action to protect their future profits, while those banks that would fail anyway, do not see benefits from doing so. Hence the root origin is that banks who fail, would fail if a bank run occurs and then not be able to sell their assets, and banks that survive would also be able to sell their assets during a bank run and survive.*
Model(s) used: Ch. 15.1.3

Problem 154

Berisha Bank sees first signs of an emerging bank run with rumours about their liquidity and long-term viability spreading and first enquiries to move deposits to other banks. To ensure they can meet the anticipated liquidity needs from deposit withdrawals, they seek to liquidate some assets they hold, but find it impossible to agree a price with potential buyers. This is very much in contrast to similar times in the past, where they quickly agreed a price and thus averted to fail. Berisha Bank attributes their inability to agree a price with buyers as those buyer's attempt to force Berisha Bank to fail such that they could purchase the assets in their liquidation at a lower price.

Why would potential buyers not purchase assets now when in the past they did under similar circumstances?

Indicative answer: *The probability of a bank run could be higher than in previous times. This would imply that buyers indeed see greater benefits in waiting for the bank to fail and then purchasing the assets at a lower price; the higher chances of a bank run occurring makes it more likely that they can obtain the assets at a lower price later rather then remaining empty-handed. If the probability of a bank run occurring in the past was seen as less likely, purchasers would have found it less attractive to wait as the assets would not have been offered in case no bank run*

occurs, which was more likely.
Model(s) used: Ch. 15.1.3

Problem 155

During the recent recession, Tonic Bank Corp. has experienced increased default rates on loans they have given. Although the default rates are still regarded as low and the regulator assesses the bank as being sound, some depositors have started to withdraw their funds to other banks. While Tonic Bank Corp. is convinced these withdrawals can easily be covered by their existing liquidity reserves and if needed the sale of some assets, there is some fear that withdrawals might spread and a bank run could emerge if fear grips depositors. To reassure depositors, Tonic Bank Corp. decide to increase their liquidity by selling some of the more risky loans to institutional investors. To their surprise, they find it difficult to agree a price on these loans with investors, who let it be known that they assess the possibility of a bank run occurring as substantial.

Why can the sale of loans not easily be agreed?

Indicative answer: *The increased risks that Tonic Bank Corp. is exposed to from the higher default rates, has opened up the possibility that a bank run can occur if depositors coordinate, thus no bank run might occur if depositors expect no bank run to occur, but it will occur if it is expected. It is this high risk of a bank run occurring that will make institutional investors reluctant to purchase the loans as they could obtain them at a lower price once the bank run is emerging and the bank is forced to sell assets. For this reason purchasers of the loan prefer to wait and do not obtain the loans now.*
Model(s) used: Chs. 15.1.2, 15.1.3

Problem 156

Through friends at his bank, Ratomir Predić has received reliable information that his bank is struggling to obtain additional funding after their largest two depositors suddenly withdrew all their funding. Despite obtaining this information, he does not rush to withdraw his deposits, but tells you that he will let them earn interest a few more weeks as other banks offer lower deposit rates. You think that this is way too risky and suggest to him to take the money out instantly.

What would Ratomir Predić reply to your advice?

Indicative answer: *The information Ratomir Predić has obtained is not widely available and he can reasonably assume that this will only trickle through to the market slowly. The bank will therefore not face large deposit withdrawals instantly*

and hence be able to repay deposits for a while. This approach might be risky is information might be revealed faster than expected, but this will have to be balanced against the additional interest Ratomir Predić earns during that time. In his calculation, this additional interest outweighs the risks of the bank failing.
Model(s) used: Ch. 15.2.1

Problem 157

Haravayin Bank OJSC has severed its relationship with the most important deposit broker and has therefore suffered a large outflow of deposits, which it struggles to replace. There is serious concern within Haravayin Bank OJSC that without replacing the lost deposits, it will not be able to honour the upcoming wage payments its mainly corporate customers make at the end of the month. So far the information about the precarious situation at Haravayin Bank OJSC has not spread widely and those few customers that know are not withdrawing additional funds in significant amounts. The situation at Arevelyan Bank OJSC a few years back was very different, their depositors learning of the liquidity shortage started to withdraw larger amounts very quickly.

Why is the situation in Haravayin Bank OJSC and Arevelyan Bank OJSC so different?

Indicative answer: *In the case of Haravayin Bank OJSC the information about the liquidity shortage is spreading only very slowly and hence they balance the additional interest they can earn on the deposits against the low risk of the bank failing before they withdraw their funds; this leads them to retain deposits for considerable periods of time. The fast withdrawals of deposits at Arevelyan Bank OJSC in the past suggests that depositors thought that the information would spread more quickly; consequently they fear more withdrawals faster and will themselves withdraw deposits sooner as not to expose them to too high risks of loosing their deposits.*
Model(s) used: Ch. 15.2.1

Problem 158

It has been disclosed that some of the largest hedge funds have withdrawn from using Shin Bank plc as the bank used to deposit any temporary excess funds. Prior to this information being publicly revealed, Shin Bank plc noticed a slow trickle of deposits being withdrawn from customers who somehow seemed to have become aware of this information, but as the disclosure of their loss of the hedge funds as customers was disclosed, they were also able to disclose that a number of oil companies have agreed to deposit their funds at Shin Bank plc, although the amount they pledged was lower than the deposits lost from hedge funds. The withdrawal of deposits stopped completely at that time.

How can you explain the initial slow withdrawal of deposits prior to the public disclosure and its stopping afterwards?

Indicative answer: *The initial withdrawal of deposits at Shin Bank plc were the result of the information some depositors had and they feared that this information would spread, causing withdrawals in the future. As the information was not widely available, they did not expect deposits to be withdrawn quickly and hence were in no rush to do so themselves. After the disclosure the information was available, but with the additional information that the lost deposits are replaced at least partially, depositors were reassured that the bank would not face a liquidity shortage and thus a bank run would not be rational anymore, stopping these withdrawals and those newly informed about the situation at Shin Bank plc see no need to withdraw their deposits.*
Model(s) used: Chs. 15.1.1, 15.2.1

Problem 159

In its latest financial stability report, the Moravian Central Bank warns of an increased risk to the banking system from bank runs. They argue that while the market consensus is that the overall risks of banks have not increased, despite an increasing fraction of market commentators mention an increased downside risk in the loans that have been provided by banks in recent years. There is a smaller fraction of market analysts, however, that believe that the risks are overstated and the economy is in good health.

With these assessments, how can the risks of a bank run increase as claimed by the Moravian Central Bank?

Indicative answer: *If the view of market commentators are reflected in the views of depositors, then those depositors that see an increased downside risk will be offset by those having a more positive outlook, leaving the overall assessment in the market unchanged. For bank runs to become more likely, it is necessary that more depositors take a sufficiently negative view than before and thus seek to withdraw their deposits. These more negative outlooks will be only slightly negative, but sufficient for these depositors to be withdrawing funds. These more negative outlooks will have to be compensated by other depositors having more positive outlooks on the risk of loans; these positive outlooks will have to be shared by fewer depositors than the negative assessments, but they need to be more positive than those being negative such that the fewer positive views are offset by the more frequent negative views.*
Model(s) used: Ch. 15.2.2

Problem 160

Grotius Bank is experiencing a slow withdrawal of deposits. It seems however, that depositors are hesitant to withdraw. While some depositors mention the increased risks that they believe Grotius Bank faces, this view is only spreading slowly and not shared by all. Even those that share this view are in no rush to transfer their deposits, while others with a different assessment of the bank's risk do not withdraw funds at all. This changes once they realise that the withdrawals of depositors are not subsiding but continuing at a slow and steady pace; once they realise this, they withdraw their deposits quickly, even though they believe the bank to be sound.

Why does Grotius Bank experience an initially slow bank run which then suddenly accelerates?

Indicative answer: *Initially only those depositors which had information suggesting the bank was in financial difficulties would withdraw their funds as other depositors saw no reason to do so. As this information seems to have spread slowly only, these depositors did not withdraw their funds immediately but thought it was safe to benefit from earning interest on their before withdrawing them in time before the bank will have used up their liquidity reserves. Those depositors not sharing the negative views on Grotius Bank then still withdraw their funds once they realise that the withdrawals will be substantial and the bank will eventually fail. This is not based on the information they have about the bank but their inference on the withdrawals by other depositors.*
Model(s) used: Chs. 15.1.1, 15.2.1, 15.2.2

Problem 161

Due to unfounded rumours about the risks to deposits at banks in Jórvik, the central bank advises banks to increase their deposit rates to improve the trust of depositors and avert bank runs. While many banks follow the advice of the central bank, Jórvik Första Bank keeps their deposit rates unchanged as it is widely seen as the safest of banks in Jórvik and does not see the need for such a measure; instead it is providing detailed information on the risks of loans it has provided. It is subsequently that only Jórvik Första Bank expriences a bank run, while all the other, more risky, banks did not face bank runs. While Jórvik Första Bank puts this down to bad luck, the central bank argues that not heeding their advice was the main cause of them experiencing a bank run.

Is the central bank right in their assertion that not increasing the deposit rate is the cause for the bank run at Jórvik Första Bank?

Indicative answer: *Increasing the deposit rate could have reduced the risk of a bank run for Jórvik Första Bank as withdrawing deposits would have become less attractive due to the higher deposit rate. However, providing information on the risks has the same effect. The information provided reduces the uncertainty about the*

future risks of the bank and thus depositors will be re-assured of the low risks of Jórvik Första Bank, making the withdrawal of deposits less attractive. That a bank run occurred despite these measures taken by Jórvik Första Bank could be down to a more negative than expected assessment of the bank's risks. This could have happened with a higher deposit rate as much as with the increased transparency.
Model(s) used: Ch. 15.2.3

Problem 162

After a strategy review, Volhynia Bank decides to reduce the risks of its loan portfolio, allowing it to reduce its deposit rate; their analysis suggests that this would increase their profits as they can exploit the risk-return relationship. However, they are warned that they might not be able to realise the reduction in the deposit rate if they want to avoid a bank run.

Why might this be the case?

Indicative answer: *The risks of Volhynia Bank are reduced, so in principle they should be able to reduce the deposit rate as the risks to deposits are also reduced. However, this reduced deposit rate also makes it less costly to withdraw deposits as the lost interest is lower. With some uncertainty about the risks of the bank, as is natural, this might make some depositors with negative information to withdraw deposits and other depositors knowing that this might happen would withdraw their deposits to prevent them making even larger losses from retaining their deposits. The low deposit rate then gives little incentive to not make this step, increasing the risk of a bank run.*
Model(s) used: Ch. 15.2.3

Problem 163

All banks in Viguera were subject to a bank run that could only be stopped with the intervention of the central bank. The trigger for this bank run is assumed to be the information that bank loans were more risky than expected due to a downturn in the economy as a whole; this increase in risks was higher than anticipated. The government, however, blames the media for reporting overtly negatively about the risks of banks and not giving sufficient prominence that they had provided a guarantee to banks for the first 20% of any loan losses.

Is the government correct to assert that media pointing out the government guarantee more prominently could have prevented a bank run?

Indicative answer: *The government guarantee might have actually been the reason for the bank run to occur. The guarantee reduces the incentives for the bank to*

manage risks and hence risks might have increased as a consequence, more than offsetting the benefits of the guarantee that reduces risks to depositors from the higher repayments that can be made. Hence, it is not the media coverage that is ultimately responsible for the bank run, but the provision of guarantee might have caused it and if it did not cause it, it probably would not have reduced the likelihood of a bank run.
Model(s) used: Ch. 15.2.4

Problem 164

Having been a significant provider of loans to companies in the shipping industry, Trapeza Rovas A.E. had to increase their write-offs for loans significantly after prices for shipping containers had plummeted. Many of the loans that Trapeza Rovas A.E. has provided are now categorised as high-risk and the banking regulator is concerned for the viability of the bank, even though the regulator notices that they are working well with the companies to avoid loan defaults. The fear is that with the information becoming public, Trapeza Rovas A.E. might face a bank run as depositors are not willing to accept such high risks. In coordination with the government and central bank, the regulator seeks to offer guarantees for much of the loans to shipping companies and has secured funding of €25bn to support outstanding loans of €134bn. Trapeza Rovas A.E. does not think it needs such a guarantee, but tells the regulator that if they provide one, it should cover the full amount of the outstanding loans, otherwise it will not be effective in preventing a bank run. With the guarantee not being increased after discussions, Trapeza Rovas A.E. rejects the offer, even though no premium would be required.

Why does Trapeza Rovas A.E. refuse the low guarentee and pressed for a larger one?

Indicative answer: *The guarantee is covering only a small fraction of the outstanding loans and as such its provision might actually increase the risks that Trapeza Rovas A.E. is taking, or at least that could be the inference of depositors. The guarantee reduces the losses to Trapeza Rovas A.E. and this will reduce their incentives to work with shipping companies to maintain loan payments, increasing risks. With such risks correctly anticipated by depositors, the guarantee might trigger a bank run as the lower effort by the bank would not be compensated by the small guarantee. Only once the guarantee is sufficiently high, will the increased payments from the guarantee outweigh the higher risks from less monitoring effort. It is thus that only a high guarantee would reduce the overall risks to depositors and reduce the threat of a bank run.*
Model(s) used: Ch. 15.2.4

Problem 165

Waldon Bank plc. seeks government support to avert a possible bank run. Recent losses on loans have raised doubts about the safety of deposits with regulators and once this information becomes public, they believe a bank run is possible. The bank believes that a guarantee for loans of approximately 20% of the whole loan portfolio would compensate for the increased risks and allow them to maintain their low deposit rate and thus retain profitability.

Should Waldon Bank plc. proceed to apply for such a guarantee and/or are other measures more likely to avert a bank run?

Indicative answer: *If applying for a small guarantee, Waldon Bank plc. would have strong incentives to reduce the monitoring of loans and this would increase the risks, potentially more than offsetting the benefits of the guarantee from the depositor's perspective. Applying for a guarantee that covers a larger proportion of potential losses would be needed to reduce the risks to depositors; while this reduces monitoring efforts of the bank even more, the guarantee more than compensates for this effect. Another risk for the possibility of a bank run is the low deposit rate, which makes the early withdrawal of deposits attractive as not much interest is lost when doing so. Increasing the deposit rate would help to avert a bank run, although this comes at the cost of lower profits to Walden Bank plc.*
Model(s) used: Chs. 15.2.3, 15.2.4

Problem 166

After several bank runs in neighbouring countries, the banking association suggests to its members that they make the withdrawal of deposits less attractive. An initial proposal to increase deposit rates throughout were rejected by banks as this would reduce their profits too much. However, banks suggest that they will maintain the overall payments on deposits, but will differentiate more between different deposits.

How could banks structure they deposit rates such that the likelihood of bank runs is reduced while maintaining their profitability?

Indicative answer: *The banks could lower the deposit rate on deposits in general, but then offer a bonus for all those deposits that are retained for a longer time period. This would give an incentive to depositors to not withdraw their funds as they would only earn low interest, while maintaining the deposit for a longer period of time would give depositors a higher return.*
Model(s) used: Ch. 15.3

Problem 167

The banks in Nekor are not competitive and charge high loan rates while offering low deposit rates; however, unlike some of their neighbouring countries, the few banks that operate in Nekor are regarded as being safe and well-managed, thus attracting some deposits from these countries. In order to increase the attractiveness of their banks to increase foreign deposits, the government introduces measures to increase competition between banks. The aim is to raise deposit rates and through more competition increase lending to domestic companies, accelerating economic growth. After measures have been implemented, deposit rates indeed increase and lending increases slightly, but the increase in foreign deposits does not only not materialise, they have reduced. The government is puzzled why foreign deposits are reducing rather than increasing, despite the higher deposit rates.

How can you explain this result?

Indicative answer: *The competition has not only increased deposit rates, but the reduced profit margins will also have increased the amount of deposits that are lent out, lowering the amount of cash reserves. As the amount of cash reserves are reduced, banks are less resilient against bank runs as smaller withdrawals will cause banks to use up their liquidity reserves. Thus the risk of a bank run and losses to depositors has increased, more than offsetting the benefits of higher deposit rates for foreign depositors, who subsequently withdraw them.*
Model(s) used: Ch. 15.4

Problem 168

A trade agreement between Buyeo and Lazica does not only envisage the reduction of tariffs on goods but also the liberalisation of services, including the banking sector; both countries allow each other's banks to operate freely in their own country. In both countries banks have warned against this liberalisation of their respective markets without additional safeguards as it would increase the costs to consumers. These concerns have been ignored as an attempt by banks to retain their profits by limiting competition.

Was it correct to dismiss the concerns of banks as being driven by their desire to maintain profits?

Indicative answer: *The opening of the banking market will increase profits and in this sense banks will be concerned about their profits, however, the lower profits of banks will lead to them seeking to compensate by increasing their lending. This will lead to less cash reserves being held and this banks will be less able to accommodate the unexpected withdrawal of deposits, making them more vulnerable to bank runs. This is the additional risk that banks were referring to. Whether the decision to dismiss these concerns and hence the risk of bank runs was correct will depend on the benefits of increased lending and lower loan rates as well as higher deposit rates*

and the costs from a higher likelihood of bank runs. If the benefits overall outweigh the costs, the decision was correct, otherwise remedies might have to be taken to reduce the risk of bank runs.
Model(s) used: Ch. 15.4

Problem 169

You observe that banks offer demand deposits, deposits that can be withdrawn at any time, at lower rates than term deposits, which require depositors to give three to six months notice of withdrawing them. The difference between the deposit rates are substantial and you do not feel that they can be fully explained by depositors of term deposits giving up the ability to access them for cash immediately. You also notice a curiosity in that banks with lower cash reserves pay lower deposit rates on demand deposits and higher deposit rates on term deposits than banks with higher cash reserves. You find this peculiar as you would expect that banks with less cash reserves are paying higher deposit rates to ensure they are not withdrawn easily.

How can you explain this observation?

Indicative answer: *Banks offering a higher deposit rate on demand deposits require larger funds if deposits are withdrawn and therefore have to hold higher cash reserves. These higher cash reserves limit the amount of loans that can be provided and therefore the profits the bank can make, allowing them to pay less interest on term deposits. It is therefore that to avoid bank runs, paying a higher deposit rate on demand deposits banks hold higher cash reserves, allowing them to pay lower interest on term deposits. Another effect is that a higher deposit rate on demand deposits makes their withdrawal costly to depositors and they will therefore be more reluctant to make such withdrawals, protecting the lower cash reserves held.*
Model(s) used: Ch. 15.3

Problem 170

It has been observed that with increasing wealth, deposits at banks in Funan have steadily increased, not least as there is no bond and stock market available for investment. While banks have traditionally been very conservative in their lending policies to limit the risk of loan defaults, this caution has become less and less dominant as banks sought to invest the deposits they are holding and had to provide loans to more risky companies. This, however, has increased economic growth, but has also resulted in some economists questioning the stability of the banking system. As a consequence of such concerns, the government has reassured depositors that it backs deposits held at all domestic banks; however, significant doubts remain about the ability of the government to make these payments if required. This intervention of the government did affect deposit rates. Short-term deposits that could be withdrawn at any time saw lower deposit rates, while those of long-term deposits that could only be withdrawn with a notice of three months and longer, were increasing. The government attributes the lowering of the short-term deposit rate to the provision of the government guarantee of deposits, however this does not explain the increase in deposit rates for long-term deposits that were also covered by the guarantee.

How can these changes of the deposit rate be explained?

Indicative answer: *In principle the deposit rates should fall in response to the government guarantee, but as the market is skeptical bout the ability of the government to meet its obligations, the impact of this guarantee will be minimal. The announcement by the government, however, might have sent a signal about the risks that banks are taking and thus the perception might be that risks are higher than what they were assessed to be before this announcement. This would have led banks to reduce the deposit rate on short-term deposits so that banks are perceived to be able to meet any withdrawals and do not need to hold larger cash reserves. The lower cash reserves allow banks to invest into more loans, allowing them to increase their profits, which can then be used to increase deposit rates on long-term deposits. The perceived higher risk of banks made this move necessary as the higher risks left less funds to repay short-term deposits, necessitating the reduction of the deposit rate to reduce the risk of the bank not being able to meet its obligations from withdrawn short-term deposits.*
Model(s) used: Chs. 14.1, 15.4

Problem 171

Parthia & Co. Bank faces a temporary liquidity shortage due to one of its major customers making a large transfer to another bank to pay an outstanding bill. Knowing that soon the same customer, as well as other customers, will obtain payments on bills they have issued, they seek to obtain an interbank loan to ensure their liquidity reserves are sufficient to cover the fluctuations of payments from smaller customers. Seeking an interbank loan of £400m, they are not successful in agreeing terms that are beneficial to them. It is only once they are dividing the loan up into four loans of £100m each, that they can agree interbank loans with four different banks.

Why could Parthia & Co. Bank not secure a single interbank loan of £400m?

Indicative answer: *In order for an interbank loan to be agreed between banks it is necessary that the size of the loan is not too big. In particular, the excess liquidity of the bank providing this loan must be higher than the interbank loan sought. As no loan terms could be agreed with another bank for the full amount of the liquidity shortage, it is reasonable to infer that none of the other banks will have excess liquidity of this amount. At least some banks have smaller excess liquidity of at least £100m and that is how Parthia & Co. Bank could secure its four loans for this*

amount.
Model(s) used: Ch. 16.1

Problem 172

Seeking quotes from various banks to provide loans in the interbank market, you observe that the loan rates banks are willing to accept differ between banks. You attribute this differences in loan rates between banks to the intransparency of the interbank market where loan rates are not published centrally, but agreed bilaterally between banks directly and resulting agreements not published. This, in your view limits competition between banks.

Would a more transparent market with loan rates being publicly available, ensure loan rates in the interbank market are more homogeneous?

Indicative answer: *The loan rates at which banks are willing to borrow depend mainly on two parameters, the preferences for liquidity and the liquidity shortage of a bank. Hence, loan rates at which banks are willing to borrow at will differ. Even if we neglect the case of bank having different preferences for liquidity, they will reasonably have different liquidity shortages and thus different reservation loan rates they are willing to accept. A transparent market with loan rates being published would not affect this circumstance.*
Model(s) used: Ch. 16.1

Problem 173

The interbank loan rate in Valychia has steadily increased in recent years. This increase is not matched by any observed change in the characteristics of loans provided by banks or the conditions they offer for loans. Market commentators widely agree that the higher interbank loan rate is the result of increasing risks in the banking system and banks, having inside knowledge of the market, will be aware of these risks, resulting in the observed increase in interbank loan rates. Szymon Brzezinski is known for often taking an opposite view on a wide range of issues in the banking market and he has been accused of doing so merely to attract publicity. He takes the view that the increase in interbank loan rates is not an indication of higher bank risks.

What would be his explanation for the increase in the interbank loan?

Indicative answer: *The interbank loan rate, on the one hand, is affected by the demand for interbank loans, as determined through the withdrawal rate of deposits from banks, which can lead to liquidity shortages. Hence, a higher loan rate could indicate that deposit movements between banks have become more volatile with*

depositors moving their funds more frequently between banks. On the other hand, the interbank loan rate is also affected by the availability of cash reserves; lower cash reserves indicate that banks will require more interbank loans to avoid a liquidity shortage while at the same time other banks will have less cash reserves they can lend out. Both factors will increase the interbank loan rate. It is therefore not that necessarily bank take higher risks that is reflected in higher interbank loan rates, it could be an indication of higher demand for interbank lending due to more volitile deposit movements and smaller cash reserves being held by banks.
Model(s) used: Ch. 16.2

Problem 174

Depositors with banks in Colonia are mostly retaining their deposits with the same bank, using deposit balances mainly to make and receive payments; they are not very sensitive to the deposit rates offered or the quality of services that banks provide, rarely moving their deposits to another bank offering better conditions. This is very much in contrast to depositors in Aken, who are more than willing to move deposits to banks that offer them better conditions; consequently banks in Aken regularly observe large amounts of deposits moved between banks. Both banking systems are deemed to be safe as banks manage any liquidity shortages between themselves efficiently.

How would you expect the interbank loan rate to differ between Colonia and Aken?

Indicative answer: *The expected withdrawal rate of deposits in Colonia will be low as depositors rarely move funds across banks, it is therefore that the demand for interbank loans will be low and therefore interbank loans rates will be low. In contrast to that, demand in the interbank loan market of Aken will be high due to depositors moving their entire funds between banks frequently. This will result in higher and more frequent cash shortages by some banks and thus demand for interbank loans will be high, resulting in a much higher interbank loan rate than in Colonia. This difference in the interbank loan rates is the result of the different demands of banks for cash reserves, not a sign for the risk of the banking system.*
Model(s) used: Ch. 16.2

Problem 175

’Rather than using deposit insurance to prevent bank runs, we should develop the interbank market and the threat of bank runs disappears.’

Has this statement merit?

Indicative answer: *Interbank markets are beneficial if there are cash shortages and excess cash holdings within the banking system; banks with cash shortages can borrow from banks with excess cash. This, however, requires that these excess cash positions and cash shortages are balanced, which will be the case if depositors move their funds between banks. However, if funds are removed from the banking sector, for example through increased cash holding by depositors, investment into other assets, or transfer of funds abroad, the cash shortage of those banks losing deposits are not accompanied by other banks having excess cash and banks cannot obtain sufficient funds, making a bank run possible even in the presence of an interbank market. Thus, interbank markets only prevent bank runs if the deposits remain within the banking system, in any other cases it is ineffective to prevent bank runs.*
Model(s) used: Chs. 15.1.1, 16.2

Problem 176

Sogram Bank faces an unexpected outflow of deposits due to the relocation of a customer with significant cash holdings, much of which was held as deposits at Sogram Bank. The total loss of deposits is \$400m, exceeding its cash reserves of \$250m. In order to ensure that Sogram Bank does not fail due to this deposit withdrawal, the three other banks in Sogram offer interbank loans with a total value of \$450m. Only days after these arrangements have been finalised, a military coup in Sogram leads to many depositors transferring their deposits overseas, leading to deposit withdrawals of \$200m for each bank, exceeding their cash reserves by \$90m. As a result of these withdrawals, all banks but Sogram Bank fail. Not without glee does the newly appointed finance minister announce the failure of all four banks and accusing three of them of recklessly supporting another bank that was already failing over and above what was needed by depleting their own safety net and closes his remarks with the comment that it serves them right.

Is the finance minister right to say that the three banks providing interbank loans to Sogram Bank were reckless?

Indicative answer: *The finance minister is correct that without the support for Sogram Bank exceeding their immediate cash demands, the other banks would have survived as they have started out with sufficient cash reserves of \$260m. They gave interbank loans of \$150m each, leaving them with \$ 110m; had they given just sufficient amounts of interbank loans to ensure Sogram Bank did not fail, they would have provided interbank loans of \$50 each, leaving them with \$210m cash reserves, sufficient to survive the deposit withdrawal of \$200m. Sogram Bank had cash reserves of \$250m and the interbank loans totalling \$450m brings their cash reserves to \$250m, enough to survive the common liquidity shock. However, it was rational for the three banks to provide larger loans as that would ensure that Sogram bank could survive other liquidity shocks. Unfortunately the size of the experienced liquidity shock was such that the other banks failed and Sogram Bank managed to*

survive. It was therefor not reckless to provide these loans, but was done to ensure that the interbank loans could be repaid in case of another liquidity shock.
Model(s) used: Ch. 16.3

Problem 177

In Thassalia banking crises have become a rare occurrence due to strict regulations of the banking sector introduced a few years ago. However, since the regulation has become much more stringent and banking crises have become much less common, any individual bank facing a temporary liquidity shortage finds it much more difficult than before to obtain funding from other banks unaffected from liquidity squeezes, even for smaller liquidity shortfalls. The central bank suggests that this development shows that the banking market is not functioning properly and it needs to intervene more often than before these regulations were introduced.

Is this a fair assessment of the banking market by the central bank?

Indicative answer: *The market for interbank loans is failing in the sense that banks are providing support to banks only for smaller liquidity shocks than would be socially optimal due to the small probability of a banking crisis emerging. Providing interbank loans for smaller liquidity shocks a bank faces is not profitable as the size of the loan is sufficient small to not affect the probability of surviving a subsequent banking crisis significantly to compensate for the potential loss of this loan. It is therefore that such smaller interbank loans are not forthcoming from banks and the central bank needs to intervene in order to provide liquidity to the bank facing the liquidity shortage.*
Model(s) used: Ch. 16.3

Problem 178

Banks in Forusha are well regulated and the credit risk they are allowed to take is highly restricted; this very much in contrast to banks in Burandu whose banking regulation is minimal, but benefits from well qualified managers in all banks. While the banking systems in both countries are seen as being safe, banks in Forusha struggle to cover liquidity shortfalls from deposit transfers between banks in the interbank market, they more often sell assets in the open market. In contrast to that, the much more heterogeneous banks in Burandu can in most instances meet their liquidity needs through interbank loans. Regulators in both countries are surprised as they would have expected the safety of banks in Forusha would make interbank loans more attractive than in Burandu, where some banks are more safe than others due to the different lending strategies they pursue.

How can you explain the seemingly surprising results seen here?

Indicative answer: *The banks in Forusha are tightly regulated and as such not only very safe, but also very similar to each other. This implies that all the risks banks are taking will be very similar, making adverse selection between banks nearly absent. This implies that banks can sell their assets at a low discount, making this way to raise additional liquidity more attractive than relying on interbank loans, which will also give a profit to the bank providing such a loan. In Burusha, however, banks are very different and hence adverse selection between banks not knowing their risks, requiring a larger discount when selling assets and hence interbank loans become more attractive.*
Model(s) used: Ch. 16.4

Problem 179

Reacting to banking crises in neighbouring countries, the government of Ruthenia decides to introduce a deposit insurance scheme to promote economic growth through building more trust in the banking system. Banks are required to pay a premium of 0.4% of their average deposits for the previous three years towards financing the deposit insurance, which will be government-backed, but operated privately through a designated company. The premium of 0.4% has been determined by actuaries on the basis of past risks banks have taken when giving loans as well as the leverage of banks. After five years operating the deposit insurance scheme, it is audited and the actuaries involved in assessing the adequacy of the premium charged, report that the risks banks take have increased and therefore a premium of 0.55% of deposits would be more adequate. The central bank as the relevant banking regulator objects to this increase in the deposit insurance premium by claiming that in the next audit the actuaries will return and demand an even higher premium and therefore suggest that the premium should be increased even more.

Is the central bank right in their demand?

Indicative answer: *On the one hand they are right, the premium most likely will increase after the next audit, but this will be the case for any premium that has been fixed in this way; it does not provide a long-term solution. Banks facing a fixed deposit insurance premium have an incentive to recover these costs by providing loans which yield a higher return; such higher returns are only possible if the risks are increased, necessitating a higher deposit insurance premium. Alternatively they might seek to provide more loans, increasing their leverage, and that way increase the risk of bank failure. Hence the risks will increase with a higher deposit insurance premium, necessitating an ever higher premium, entering a vicious cycle. For a long-term solution, the deposit insurance premium must be tailored to the risks the bank is taking.*
Model(s) used: Ch. 18.1.1

Problem 180

Lodomia has a banking system that caters on the one hand to its domestic population, but it is also a major off-shore centre seeking to attract wealthy individuals. While all banks are serving both types of customers, they are by law required to provide banking services to any legal resident demanding it, they have different degrees of reliance on one or the other market. To improve the trust in the banking system by local residents and foreign residents alike, the government of Lodomia has decided to introduce deposit insurance for all banks. This decision was driven by a number of bank failures in neighbouring countries that lead to an increased anxiety in Lodomia about the stability of their banks. During the consultation with banks about the introduction of the deposit insurance scheme, banks were generally opposed and urged the government to include only retail deposits of domestic depositors..

Why are banks opposed to the introduction of deposit insurance, even if provided for free?

Indicative answer: *Deposit insurance increases competition between banks as with deposit insurance deposits become more valuable due to the lack of default risk and hence relative to the value of other services, deposit rates become more important for depositors. This will increase competition between banks for deposits, resulting in higher deposit rates that reduce bank profits. It is therefore that banks will seek to limit the amount of deposits that are covered as much as possible to limit the increase in competition between banks.*
Model(s) used: Ch. 18.2.1

Problem 181

A recent recession saw an increase in the risk of loans overall, which was mainly due to previously low-risk companies becoming high-risk, while high-risk companies were much less affected. The higher risks of banks caused some depositors to switch their funds to other banks or to invest into other assets, causing more frequent liquidity shortages and excess liquidity in banks. While prior to the recession the interbank market was active and banks could easily cover any liquidity shortages there, this has become a less active market now. It is mainly high-risk banks that obtain loans to cover liquidity shortages while banks regarded as low-risk liquidate some assets to raise additional funds where needed.

Why do low-risk banks do not obtain interbank loans during the recession?

Indicative answer: *During the recession the number of banks being classified as high-risk will have increased due to companies changing their type, thus the probability of a bank being low-risk has decreased during the recession. This smaller number of low-risk banks increases the interbank loan rate as these interbank loans might not be repaid and this makes the sale of loans attractive to banks that can achieve a high price, the low-risk banks. Hence, low-risk banks will no longer demand interbank*

loans and the market will be dominated by the demand of high-risk banks paying a high loan rate.
Model(s) used: Ch. 16.4

Problem 182

Vosgau Bank AG and Raiffeisenbank Vosgau eG are local banks in a region where the collapse of the largest local employer will lead to many more bankruptcies of companies and also individuals will struggle to repay their loans and mortgages, together with falling house prices. While projections on the impact of the collapse on the local economy have not yet been made and the general public only slowly appreciates the impact this event will have on banks, observers notice that Vosgau Bank AG is now borrowing from Raiffeisenbank Vosgau eG in the interbank loan market, obtaining coverage for some liquidity shortages, while previously they were not lending to each other. Vosgau Bank AG soon starts to experience a slow withdrawal of deposits, while Raiffeisenbank Vosgau eG sees no sustained outflow of deposits beyond the usual movements of deposits as funds get spent and salaries are paid.

How do you explain the commencement of interbank lending from Raiffeisenbank Vosgau eG to Vosgau Bank AG?

Indicative answer: *Vosgau Bank AG sees a slow withdrawal of deposits, which suggests that depositors receive negative information about Vosgau Bank AG and this information is acted on with some delay as it is not yet that widely spread. No such deposit withdrawals are seen at Raiffeisenbank Vosgau eG, suggesting that no negative information has been received. This implies now that there are sufficient differences in the risks between these two banks that makes it attractive for Vosgau Bank AG to obtain an interbank loan from Raiffeisenbank Vosgau eG rather than liquidate some assets to cover liquidity shortages. Previously the two banks were having too similar risk profiles and it was therefore more attractive for Vosgau bank AG to sell assets than obtain an interbank loan.*
Model(s) used: Chs. 15.2.1, 16.4

Problem 183

Banca del Norte SpA experiences an unexpected high outflow of deposits for reasons they have not been able ascertain. In order to ensure their liquidity is sufficient to meet the demands of continuing their operations, they seek interbank loans from other banks, but are not able to secure such a loan. It is therefore that they approach the central bank for an emergency loan, which is provided. After providing the loan, the central bank convenes a meeting of all banks and chastises them for not providing interbank loans to Banca del Norte SpA as it gives a poor impression to the general public that Banca del Norte SpA had to rely on the central bank to intervene.

How will the banks justify their refusal to provide interbank loans to Banca del Norte SpA while the central bank saw it as beneficial?

Indicative answer: *The liquidity shock experiences by Banca del Norte SpA was substantial and providing such large interbank loans exposes them to substantial risks if Banca del Norte SpA was facing further deposit withdrawals and would thus not be able to repay this loan, in addition, the reduction in their own liquidity reserve will increase the risks they face from being subjected to deposit withdrawals. It is for this reason that banks did not provide the loans. The central bank has not to concern itself with these risks but can purely act in the best interest of the banking system as a whole and provide the loan. The fact that they did, suggests that the central bank views the risks of further deposit withdrawals as low and hence it was able to step in where banks would not find it beneficial.*
Model(s) used: Ch. 16.3

Problem 184

Banka Anadolu A.Ş. is well known for its knowledge about companies in the technology and gaming sector. Many companies approach Banka Anadolu A.Ş. to obtain a loan, which other banks are usually refusing to give as they cannot assess their business plans properly. However, limits on the funds they have available does not allow them to provide loans to all the companies they assess as being creditworthy. With a requirement to hold 5% of their deposits as liquidity reserve, they seem to have exhausted their ability to provide additional loans, while other banks struggle to find enough creditworthy borrowers. In confidence a regulator tells them that while they have to hold the liquidity reserve, there is nothing to stop them from making better use of that reserve.

What was the regulator referring to?

Indicative answer: *The liquidity reserve could be used as collateral for an interbank loan, which is not classified as a deposit and thus could be lent out fully. The proceeds of these loans could then again be used as collateral to obtain additional interbank loans, and so on. This way, Banka Anadolu A.Ş. can expand their lending and other banks should be willing to provide interbank loans to them as they do no have sufficient lending opportunities themselves.*
Model(s) used: Ch. 16.5

Problem 185

Sauter Bank has attracted large deposits through a broker from a hedge fund which has agreed to provide these funds for at least twelve months. The bank plans to use these new deposits providing short-term loans of three to six months benefitting businesses that are having temporary cash-flow problems. Given the size of the deposit obtained, the bank is not able to provide loans of that amount instantly and purchases short-term government bonds in the first instance to earn some interest on the unused funds. They plan to sell the government bonds over the next few weeks as they provide loans to businesses.

The bank treasurer proposes a better way of providing these loans, what would that be?

Indicative answer: *Sauter Bank could agree a repurchase agreement with another bank for the government bond they have invested in. This would give them a higher price for the bond than an outright sale and thus allow them to provide larger loans, generating more profits. With the repurchase date set at the time of the brokered deposit might be withdrawn, the bank can be assured to have the liquidity required to repay these deposits.*
Model(s) used: Ch. 17.1

Problem 186

Bank Seranagan is aware that some of their larger customers may withdraw deposits, but discussions with them about retaining these have not yet been concluded and the time when they plan to withdraw deposits, if at all, remains uncertain. As a measure to ensure sufficient liquidity in case these deposits are withdrawn, Bank Seranagan has chosen to retain more cash reserves than they usually hold. The treasurer of Bank Seranagan wants to invest the excess liquidity into short-term treasury bills, which they can sell at any time to generate cash reserves if needed. Concerned about the low return on treasury bills, the chief executive of Bank Seranagan suggests to engage in a repurchase agreement instead as that is more beneficial.

Do you agree that a repurchase agreement is preferable to purchasing treasury bills?

Indicative answer: *Unless repurchase agreements have a time to maturity of one day, they might not be suitable in these circumstances. While they might be useful as a store for additional liquidity, the fixed time to maturity of repurchase agreements do not make them suitable in cases where it is uncertain when liquidity will be required again; Bank Seranagan may be exposed to liquidity risk if deposits are withdrawn before the repurchase agreement has reached maturity. Thus, unless repurchase agreements have a maturity of a single day or at most the minimum notice period the bank will obtain before deposits are withdrawn, the purchase of treasury bills*

would be more appropriate.
Model(s) used: Ch. 17.1

Problem 187

The International Bank of Nortinga has for years relied on repurchase agreements to finance their loans. Having to comply with complex rules about liquidity requirements, they have found that purchasing government securities can be part of the required liquidity and the use of repurchase agreements involving these securities does not affect their status as liquidity reserve, provided the maturity of such repurchase agreements is not exceeding one week. This arrangement has been working for years without problems and the International Bank of Nortinga relies to a significant degree on these repurchase agreements being extended, which has never been in doubt. However, one of the main providers of repurchase agreements has now declared that they will not extend the current arrangement as their business focus has changed.

Will International Bank of Nortinga find it easy to engage with another bank in a new repurchase agreement?

Indicative answer: *Given that repurchase agreements have been extended without problems for years, the likelihood of these rollovers must be assessed as being close to 1. It is therefore that International Bank of Nortinga will have a large amount of loans provided based on these repurchase agreements and will therefore have a large liquidity shortfall. Such a large liquidity shortfall requires the provision of significant collateral. Given that banks will take a haircut on collateral and not accept it at its face value, International Bank of Nortinga is unlikely to have sufficient collateral to obtain a new repurchase agreement.*
Model(s) used: Ch. 17.2

Problem 188

Based on rumours amongst banks about the risks associated with the loans that Provident Bank Ltd. has provided in the recent past, the bank faces significant liquidity problems. They had extended their lending aggressively by seeking additional funds through interbank markets and repurchase agreements with hedge funds. As the rumours spread, interbank loans are not extended, causing a significant shortfall in liquidity, while hedge funds are willing to roll over existing repurchase agreements in full knowledge of these rumours. Facing the prospects of having to seek an emergency loan from the central bank, the senior management of Provident Bank Ltd. refutes any concerns about the risks of recent loans and accuses other banks of trying to benefit from their possible failure, while praising hedge funds for their continued support.

Why would interbank loans be withdrawn but hedge funds continue to roll over repurchase agreements?

Indicative answer: *The rumours about the qualities of loans at Provident Bank Ltd. has put the bank, in the view of other banks, in the category of being high risk, or at least being very likely to be of high risk. This has increased the credit risk for interbank loans and for this reason they are not willing to supply them anymore. While hedge funds might share the assessment of Provident Bank Ltd., their repurchase agreements are secured by collateral, which is not based on these loans but other securities. Thus, even if Provident Bank Ltd. were to fail, they would be able to retain the collateral and are therefore not facing credit risk. Therefore repurchase agreements continue to be offered.*
Model(s) used: Chs. 16.4, 17.2

Problem 189

Reliable Insurance SA seeks to expand their business into new markets and explore the possibility of offering deposit insurance. However, in contrast to other deposit insurance schemes, the insurance is not provided to banks, but to depositors directly. Advisors suggest to not proceed with their idea as banks would increase their risks, making the insurance not profitable. Managers at Reliable Insurance SA dismiss this advice.

Are they justified in doing so?

Indicative answer: *The deposit insurance as envisaged by Reliable Insurance SA does not affect the incentives of banks directly. It is not banks that benefit from the payment of the insurance, but only depositors. As no payments are made to the bank, this insurance would not affect the outcome for banks and hence their incentives to take risks in lending would not be affected.*
Model(s) used: Ch. 18.1.1

Problem 190

Every five years the regulator determines the deposit insurance premium of banks. After assessing Koningen Mutual Bank, it is charged a deposit insurance premium of 0.56% of its deposits, while Fresning Bank plc is only charged 0.47%. Koningen Mutual Bank complains to the regulator in what it sees as a discrimination against mutual banks in favour profit-driven businesses. They point out that the assessment has shown that the average risk of the loans given by both banks are nearly identical and they also argue that Koningen Mutual Bank has an equity ratio of 7%, while Fresning Bank plc only has 6.5%. They believe that this should result in Koningen Mutual Bank to be charged a lower deposit insurance premium. The regulator insists that their assessment is fair to both banks and points out that Koningen Mutual Bank operates a business model that, while not inherently more risky than that of Fresning Bank plc., relies on a small number of local businesses to lend to, whereas Fresning Bank plc provides loans to a large number small business and individuals.

Why would the deposit insurance premium charged to Koningen Mutual Bank be fair?

Indicative answer: *The risks of loans that both banks provide are similar, suggesting at first sight a similar deposit insurance premium. The lower leverage of Koningen Mutual Bank would mean that risks to the deposit insurance is lower here, implying that the deposit insurance should therefore smaller for Koningen Mutual Bank. However, the important difference is that Koningen Mutual Bank lends only to a small number of businesses and will therefore not be well diversified, while Fresning Bank plc. lends to a wide range of borrowers, thus being well diversified. This diversification will reduce the risk of Fresning Bank plc. significantly and justify the lower deposit insurance premium.*
Model(s) used: Ch. 18.1.2

Problem 191

Kitava Bank PLC has seen its deposit insurance premium increase from the previous year. While they appreciate that they have acquired new customers that were more risky, they do not see that this would justify the size of the increase in the premium they have been given. They point out that Kitava Bank PLC is highly profitable, making better use of its resources than previously. For example, they have reduced the excess liquidity they had and used the released funds to increase their lending, without increasing their deposits.

How can the deposit insurer justify the increase in the deposit insurance premium they have quoted?

Indicative answer: *While the risks of the banks have not changed significantly from the new borrowers to justify the increase in the deposit insurance premium, Kitava Bank PLC has also increased its leverage. As it has provided more loans by releasing some of the liquidity reserve, which is generally regarded as risk-free, the overall risk of the bank will have increased.*
Model(s) used: Ch. 18.1.2

Problem 192

Until recently, Banca Fontana SpA was a specialist lender to artisans and independent shops selling their products, a sector which other banks were not actively involved in. As profit margins for lending to such businesses were low, they have acquired another bank, Banca Populare Fontana, which is a slightly smaller mutual bank operating a mainstream lending model with higher profit margins, comparable to most other banks. The risks of the loan portfolio of Banca Populare Fontana are slightly lower than those of Banca Fontana SpA, but overall their cautious lending policies are compatible with each other. The financial regulator charges banks a deposit insurance fee based on the characteristics of their business. Banca Fontana SpA used to be charged a deposit insurance premium equivalent to 0.27% of their deposits and this has now increased to 0.42% for the new entity. As a mutual bank, Banca Populare Fontana was not part of the deposit insurance scheme, which only applies to non-mutual banks. The management of Banca Fontana SpA are at a loss as to how the deposit insurance premium could increase so much, when the new entity has overall the same characteristics as its predecessor.

Why has the deposit insurance premium of Banca Fontana SpA increased?

Indicative answer: *While the overall characteristics of Banca Fontana SpA after the merger has not changed significantly, the risk even seems to have reduced slightly, the newly merged bank is no longer a specialist lender, but one that through the acquired bank has become a mainstream lender, and as such their correlation with other banks will have increased significantly. Thus, the risks of Banca Fontana SpA failing together with other mainstream banks has increased, increasing the potential social costs and making the need for a bailout more likely. The new deposit insurance premium will take into account these additional social costs, which lead to the increase in the deposit insurance premium.*
Model(s) used: Ch. 18.1.3

Problem 193

Makuria is a country where companies are highly dependent on bank loans to finance investments and deposits are the main form individuals keep their savings. The neighbouring Kingdom of Farussia, in contrast, has a well developed bond and stock market that not only is the main source of funding for companies, but is also widely used by individuals to invest their savings; banks do exist, but play a much less prominent role in the economy than in Makuria. The banking system in Makuria is characterised by all banks having similar policies and operating in all markets, making banks mostly indistinguishable from each other, while in the Kingdom of Farussia each bank operates its individual nice market, with only limited degrees of overlap. Investigating the reasons for this difference, you cannot find any other distinguishing features between the two countries, which both operate deposit insurance schemes where banks are charged the full costs of any failures as a premium, so there are no differences in the risk to depositors in either country. In both countries there are a large number of banks, none is dominating the market, therefore you attribute the observed differences in the bank strategies to different business cultures.

Is there another possible explanation for banks behaving very differently?

Indicative answer: *One key difference between the two countries is the importance of banks in the economy. Banks play a key role in Makuria as they provide nearly all loans to companies and individuals rely on them for their savings; in such a situation it would be very costly for allow banks to fail, especially if there are multiple banks failing simultaneously. These high social costs will lead to a situation in which the failure of multiple banks will result in them being bailed out. While an individual bank might not be bailed out, this is likely to happen if multiple banks fail. It is therefore that banks will follow similar strategies such that if they fail, other banks are likely to be affected similarly and hence will also fail, causing a bailout by the government. In contrast to this, the minor role banks are playing in the Kingdom of Farussia means that the social costs of banks failing are low, making a bailout unlikely. The deposit insurance in this case will incentivise banks to follow different business strategies and avoid large-scale failures of banks. The high social costs in Marukia were giving a too strong incentive for banks to ensure a bailout is firthcoming in case of widespread failures and the deposit insurance was not able to overcome these incentives.*

Model(s) used: Ch. 18.1.3

Problem 194

With banks generating record-level profits, a discussion has emerged about the implicit government guarantee for deposits. A statement during a banking crisis seven years ago made it clear that the government would ensure that no depositor will loose money if a bank would fail. It was acknowledged at the time that this would put potentially significant strains on public finances if this guarantee was ever called upon, but it was seen as necessary at the time to avoid having to bailout banks suffering deposit withdrawals; it is generally understood that this commitment by the government is still valid. As banks were never charged a fee for this guarantee and they are highly profitable now, it has been suggested that banks should make a contribution to these costs and an additional tax of 5% on their profits has been proposed by some politicians. Critics of this approach claim that such a move would be counterproductive and increase the chances of another banking crisis; instead the guarantee should be withdrawn.

Is this criticism justified and should the guarantee be abolished?

Indicative answer: *It has to be noted that the proposed tax represents a deposit insurance fee that is not based on the risk of the bank. As such the bank would have*

an incentive to increase its risk by granting more risky loans and increase their leverage. However, the deposit insurance is already in place, hence the incentive do exist already. By charging the additional tax, however, banks might seek to recover the lower post-tax profits and this will generally be only possible by increasing risks as these would generate higher returns. The consequence would be that banks become more risky, contributing to a higher possibility of a future banking crisis as banks are more likely to fail and hence more likely for multiple banks to fail. Withdrawing the guarantee would eliminate the incentives to increase risks and reduce the risk to individual banks as well as the banking system as a whole. A second effect of the deposit insurance with a deposit insurance premium independent of the risks banks take, maybe to increase the risk as banks will align their strategies to secure a bailout in case they are failing through triggering a banking crisis. This risk is, however, independent of the amount of the fee charged, or whether a deposit insurance exists in the first place, and hence the tax would not change this incentive. In order to reduce this risk, a deposit insurance premium that reflects the risk of causing a banking crisis should be applied, but this is not proposed. Hence, overall, the introduction of the tax would slightly increase the incentive for banks to increase their risks further, while abolishing it would likely reduce the risks banks take. The strength of each effect is difficult to assess, hence it might well be that the effect is sufficiently small and the introduction of the tax is overall beneficial.
Model(s) used: Chs. 18.1.1, 18.1.3

Problem 195

The Financial Regulatory Institute is the financial regulator in Samaril and seeks to protect depositors from banks failing. Their initial plan in a consultation paper is to charge banks a flat fee of 0.16% of the relevant deposits as an insurance premium and cover the deposits of all private depositors as well as offer a reserve fund for potential bailouts if bank failures become more widespread. Their proposal has been criticised from many experts, it included a criticism of the level of the fee as not taking into account the effect the deposit insurance has on banks' behaviour, which will increase the risks they are taking. A suggestion that was made multiple times is to base the fee that each banks is charged on the risks the banks takes when providing loans.

Would this change to the way the deposit insurance premium is determined solve the problem of banks increasing risks?

Indicative answer: *With a fee based on the risks of the individual bank, if priced appropriately, the incentives for banks to increase their individual risks will indeed be addressed. However, as the deposit insurance is set up, it is proposed that funds are accumulated to finance bailouts of banks. Knowing that bailouts can happen will give banks incentives to align their businesses such that either none or all of them fail, to ensure a bailout is forthcoming, as it is only available if a banking crisis*

emerges, that is the failure of multiple banks. Hence the deposit insurance premium has to take not only into account the individual risk of a bank, but also the risk, and costs, of a bailout to avoid incentives for banks to increase the probability of a banking crisis.
Model(s) used: Chs. 18.1.1, 18.1.2, 18.1.3

Problem 196

'We do not need deposit insurance, the free market has found a solution, it is called the interbank market. As always, if regulators interfere, however well-meaning they are, they will make things worse.' This statement was made during a discussion about reforms of the banking sector by libertarian economist Marc Roeckel.

Is there substance to this statement?

Indicative answer: *The interbank market can act as a deposit insurance only in some instances. Most notably it allows banks to obtain liquidity if they face a withdrawal of deposits, while other banks have excess liquidity reserves; this will most notably be the case if depositors transfer their bank from one bank to other banks. Those banks receiving additional deposits could lend their excess liquidity reserve to the bank facing this withdrawal. However, this mechanism will not work if there is widespread withdrawal of funds out of the banking system, either into other assets and cash or to banks abroad; in this case other banks will not obtain excess liquidity reserves they can lend to the bank affected. Furthermore, interbank markets only work sufficiently well if banks are seen as safe by other banks; banks seen as having a high credit risk and facing deposit withdrawals for this reason will not be able to secure interbank loans. In these cases, the only way depositors can be protected is through deposit insurance. Deposit insurance is, however, not without its challenges. If the pricing of deposit insurance is not reflecting the risk a bank is taking, it might incentivise the bank to increase its risk. In addition the price of deposit insurance premium needs to take into account the social costs of a banking crisis and the costs of bailouts as banks have an incentive to align their strategies to fail or succeed together and in the former case trigger a bailout, something which the failure of a single bank may not trigger.*
Model(s) used: Chs. 16.2, 18.1.1, 18.1.3

Problem 197

A pamphlet issued by the Banking Association of Eyalat states that 'Your deposits are safe in our member banks. If a bank comes under pressure because depositors worry about the safety of their deposits, other banks will support it by providing them with additional loans to ensure your deposits are safe and accessible at all times. Therefore, there is nothing to worry about, you are in safe hands.'

Is this statement correct?

Indicative answer: *It is true that if a bank faces deposit withdrawals, other banks might provide it with interbank loans. However, they are only able to do so if they have excess liquidity themselves, thus it requires a transfer of deposits from the affected bank to other banks; a withdrawal of funds from the banking system, for example into cash or overseas, would not generate the excess liquidity in other banks needed to be able to provide such interbank loans. Without other banks have excess liquidity, their ability to provide interbank loans to such a liquidity shock is limited, although they might do so, but this will reduce their own liquidity reserves, put themselves under more risk of failing if any subsequent liquidity shocks occur to them. Furthermore, if the withdrawal of deposits if based on negative information about the value of the assets of the banks, for example a high default rate on its loans, then the credit risk to other banks will be substantial and they would not be willing to lend to this bank, even though they might have the excess liquidity from transferred deposits. Thus the statement is only true in the specific circumstances where a bank faces the withdrawal of deposits, these deposits are received by other banks and there is no negative information about this bank.*

Model(s) used: Chs. 16.2, 16.3, 16.4

Problem 198

The Association of Bank Customers, a group representing the interests of private bank customers, has commissioned a report that recommends to increase the limits for deposit insurance from currently £60,000 to £150,000. Market commentators are surprised by the group pursuing this agenda as having deposits in excess of £60,000 is well outside the scope of their interest group.

Why would the Association of Bank Customers seek an increase in the limit for deposit insurance, even through their interest group are unaffected by this change?

Indicative answer: *It is true that those depositors the Association of Bank Customers represents will not directly benefit from the deposit insurance. However, they will indirectly benefit from the reduced risks to larger deposits as this increases competition between banks for deposits, making deposit rates more important than bank services for the utility of depositors as the value of deposits increase. Hence competition for larger deposits will have a positive effect on smaller deposits.*

Model(s) used: Ch. 18.2.1

Problem 199

The deposit insurance in Rolturia is provided by a private company, which is government-backed and charges a fair premium to banks. Each bank can decide whether they want to participate in the scheme or remain uninsured. As the deposit insurance scheme is voluntary, until recently very few banks were participating and the coverage they provided was for small amounts only. However, during the last few years a number of new banks have been opened, some as subsidiaries of foreign banks and other backed by local investors, which mostly participate in the deposit insurance scheme. These banks are all small and specialising in lending to underprivileged groups, such a low-income families, or providing services to newly founded companies; to gain market share, they have priced their loans very competitively. The established banks have mostly neglected this market segment and focussed on mainstream borrowers, with a main focus on mortgages and other secured lending. It has been suggested that the new banks seek deposit insurance because as newcomers they do not have sufficient reputation with depositors and they seek to reassure them through deposit insurance that they are safe banks.

Do the newly established banks take out deposit insurance to reassure depositors about their safety?

Indicative answer: *The reason for the use of deposit insurance is not to build confidence, but is rooted in the risk these banks are taking. By focussing on more risky loans to high-risk groups like disadvantaged people and the usually more risky new companies, the risks they are taking, makes it beneficial to take out deposit insurance. While deposit insurance is costly, the banks benefit from being able to offer lower deposit rates, which given the higher default rates on their loans will reduce significantly, more than outweighing the costs of the deposit insurance; given the competitive pricing of loans, the high default rate will make the losses from reduced lending relatively small compared to the benefits from lower deposit rates. The established banks are very safe, given their loan focus, and hence there would not be much benefit from, the reduction in the deposit rate; consequently they do not take out deposit insurance.*
Model(s) used: Ch. 18.2.2

Problem 200

Kornato Bank has started to reposition itself in the market. While it was established as a bank providing loans to agricultural enterprises and farmers, usually backed by mortgages on farmland and using machines as collateral, they have now expanded into firms developing and selling environmentally friendly electricity, a much more volatile business offering few collateral against the loans they provide. They found that the lack of competition in this market allows them to provide loans at much higher margins than in their previous lines of business. While for a short time they considered to seek comprehensive deposit insurance, they decided to not incur these costs and instead pay higher deposit rates to compensate for the higher risks they are taking and limit themselves to insuring only a small fraction of their deposits provided by private individuals.

Why has Kornato Bank considered taking out full deposit insurance but then decided against it?

Indicative answer: *While the higher risk the bank is now suggesting that deposit insurance might be beneficial, they have also been able to provide loans at high loan rates given their strong market position. As the condition to provide widespread deposit insurance if that* $\pi^2(1 + r_L) < 1$, *the increase in the loan rate will have been sufficient to not meet this condition, despite the risks increasing* (π *reducing).*
Model(s) used: Ch. 18.2.2

Problem 201

The National Deposit Guarantee Scheme offers all banks to insure deposits for a fixed annual fee of 0.17% of the insured assets. It is at the discretion of banks which types of deposits they include into this insurance, the only requirement is that depositors must be made aware whether they are covered by the National Deposit Guarantee Scheme or not. For years Old Wessex Bank has not provided deposit insurance to their deposits but now seeks to fall in line with other banks and they include basic salary accounts with a balance up to $5,000, which represents about 80% of the deposits they are holding. Many loyal customer see this move as a result of an increasingly competitive banking market, which not only has eroded profit margins, but has also left Old Wessex Bank struggling to hold on to depositors as well as traditional and well-established borrowers, instead having to resort to finance start-up companies as well. The management of Old Wessex Bank justifies taking up deposit insurance as a measure to provide small depositors with additional security and not be at a competitive disadvantage in attracting deposits and retaining those well-established borrowers that have not switch to other banks.

Will taking up the deposit insurance stop the competitive pressure on Old Wessex Bank and will its risk-taking stabilise?

Indicative answer: *Firstly,. the use of deposit insurance will not change the competitive pressures that Old Wessex Bank is under; the deposit insurance will allow it to reduce deposit rates as the risk to depositors has reduced, but this is merely adjusting for risks. The reason for taking up deposit insurance is that over time the risks that Old Wessex Bank takes has increased and it is now optimal for their profits to include some degree of deposit insurance; the higher risks, combined with the lower profits margins, hence loan rates not increasing in line with risks, makes loans less valuable and the reduced lending due to the additional costs from deposit insurance premium payments are more than compensated by the lower deposit rate. While taking up deposit insurance has no effect on the competitive position of Old*

Wessex Bank with respect to deposits and loans, the fixed fee nature of the deposit insurance will provide incentives to Old Wessex Bank increasing its risk further. Thus the increase in risk-taking will most likely continue.
Model(s) used: Chs. 18.1.1, 18.2.2

Problem 202

Having given highly risky loans to finance the acquisition of commercial property by a number of property development firms, Ongerto Construction Bank plc. has suffered significant losses from defaults after property prices collapsed and the value of the property on which the mortgages were based could not be realised. The accumulated losses are such that Ongerto Construction Bank plc. is bankrupt and fails to make payments to their depositors. Based on a previous pledge by the Ministry of Finance that depositors will never suffer from poor decisions of banks, the government agrees to bailout depositors and repay them their deposits. This decision leads to a debate in parliament where a number of opposition members criticize the government, not for making payments to depositors, but that this payment comes out of public funds and is not paid by the banks themselves. The Minister of Finance agrees that this is an unacceptable situation and promises to consult on the introduction of a special tax on banks which is paid into a fund to finance such payments to depositors. Unsurprisingly, banks are opposed to such a tax.

How would banks argue against the use of this tax to finance future payouts to depositors?

Indicative answer: *The government has provided a guarantee to depositors, thus effectively provided deposit insurance, but they have not charged banks for this provision. The tax proposed is very much like the government levying a deposit insurance tax on banks. This could be detrimental to future economic growth as banks would have to pay this tax out of the funds they have available, their equity, and thus they would have to reduce lending as they will face a limit on their lending, relative to the amount of equity. Given this leverage, the amount of lending that is reduced exceed the amount of tax collected by many times. This significantly reduced lending will reduce investment by companies and thus reduce future economic growth. If, however, the deposit insurance premium is provided through general taxation, the effect will be only to reduce deposits by the amount the tax raises from depositors, and no effect arises from non-depositors paying tax, which is not subject to this leverage effect, giving a much lower impact on lending.*
Model(s) used: Ch. 18.3

Problem 203

Libertarian president Edoardo Mancini seeks to abolish as many regulations as possible and allow the economy to regulate itself. Amongst many other targets for his policy is the banking sector and here he suggests to abolish any lending restrictions, including leverage constraints. His argument is that through competition banks will have to pay adequate deposit rates to compensate for the risks banks take and the higher deposit rate will give an incentive to limit the leverage and thereby the risk that banks take. To placate critics, at least in the short term, he proposes that banks set up a deposit insurance scheme, financed by banks themselves, depositors making a contribution, and as a sign of goodwill he agrees to small tax to subsidize this fund.

Will the deposit insurance scheme work?

Indicative answer: *It would be optimal for the deposit insurance to be financed out of general taxation only. That way the lending of banks could be maximized by not reducing resources available for lending, either from banks' equity or deposits. If this money is coming out of taxation levied on funds not available to banks, bank lending would be maximized and the benefits this generally brings can be used optimally. However, as bank lending is providing better returns than other investments, all funds will be provided by banks. This would leave no basis for a tax on non-bank investments, no tax revenue would be raised and the deposit insurance would have no funds to repay depositors if needed.*
Model(s) used: Ch. 18.3

Problem 204

A heated discussion in a parliamentary debate on the introduction of deposit insurance leads Marc Hardcliff, well known for his proximity to the banking sector as a former senior manager in several leading banks, to say: 'Banks don't want it and if you think you need to force it down their throats, they should not pay for it.' On the shouted intervention 'Who will pay it then?', the bluntly replies: 'Everyone should pay it through their taxes.'

Does Marc Hardcliff represent purely the position of banks or would his suggestions be overall beneficial to the economy?

Indicative answer: *His position on banks not wanting deposit insurance is clearly the position of banks and not the wider public, nearly of whom will be depositors as well. In this part of his statement is acts as a lobbyist for the banking sector and goes against the interests of depositors. However, once it comes to the payment of the deposit insurance, if introduced, his suggestions of paying for the deposit insurance through taxation is for the wider economic benefit. Requiring banks to pay for deposit insurance will reduce their equity and hence limit their ability to lend, which will reduce significantly due to the high leverage they have, while taxation will have much less effect on lending; while lending is reduced, depsoitoprs and other investors are*

not subject to the leverage and hence the effect on bank lending is much smaller.
Model(s) used: Chs. 18.2.1, 18.3

Problem 205

A meeting of the treasury strategy group discusses issues in the short-term and medium-term financing of Mariska Bank plc. for the nearing Christmas period, which always sees a lot of fluctuations from payments between companies but also from individual customers transferring funds and making purchases. Quickly the discussion settles on the question of whether to fill any liquidity shortages with interbank loans or repurchase agreements with other banks. The same discussion then also ensues for how to make use of any excess liquidity reserves. Quickly two groups of people emerge, one claiming that interbank loans and repurchase agreement are essential the same, while others claim they are quite different.

Which group is correct?

Indicative answer: *In many ways interbank loans and repurchase agreements are similar; both can be used to obtain additional liquidity from other bank at short notice, or use excess liquidity to provide a loan to other banks. In a first instance, the main difference is that repurchase agreements are collaterised, while interbank loans are usually unsecured. Thus the use of repurchase agreements to obtain liquidity would depend on the ability of suitable securities that can act as collateral, which is a constraint not faced with interbank loans. Of course, with interbank loans being unsecured, credit risk becomes more important and may lead to a bank not being able to secure funding if they are deemed to be of too high risk, while with a repurchase agreement this should not be a constraint as long as collateral is available. However, in addition, the collateral that has been obtained, actually been sold to the bank providing the collateral, can now be used as collateral itself to obtain liquidity, for example if the liquidity situation of the bank changes or it seeks to pursue other investments. Thus the collateral from repurchase agreements can be used for rehypothecation, something that is not possible with interbank loans. Interbank loans can however, be used to fund additional investments and these investments can be used as collateral to obtain an additional loan in a collateral pyramid. A final difference is that in practice repurchase agreements are usually more long-term than interbank loans, but this can be negotiated individual and very short-term repurchase agreement exist as well as more long-term interbank loans.*
Model(s) used: Chs. 9.3, 16.3, 16.5, 17.1

Problem 206

The competition regulator is concerned about the increasing cooperation between banks to provide account services to customers of other banks. They see this cooperation as undermining competition between banks by establishing, in principle, a single large bank. The latest announcement was that a group of seven banks already cooperating have reached an agreement with another group of five banks, that are also cooperating, to offer a access to each other, making a group of twelve banks cooperating.

Why are these two bank groups seeking to cooperate and is this detrimental to customers?

Indicative answer: *It is probably that due to the increasing availability of services through cash machines and banking hubs that a wider cooperation between banks is beneficial. Technological progress allows banks to offer more and more services, reducing the need to visit bank branches for customers; the cooperation between banks is a reaction tho this technological development. The benefits to customers are that they have easier access to such services and it also increases competition between banks, benefitting customers, although this will be partially offset by banks knowing of these benefits to customers and reducing deposit rates. Nevertheless, overall customers benefits due to reduces costs to access services.*
Model(s) used: Ch. 19.1.1

Problem 207

A group of mutual banks offers their customers free access to each other's facilities to obtain cash, access account data, and obtain basic advice on banking services. The same arrangements are in place for customers of savings banks, who can obtain services at any other savings bank. For a long time, mutual and savings banks have refused to consider a more widespread cooperation to allow access to each others' customers. After a meeting between some of their respective banks, it has been suggested that such cooperation should be considered.

Why would such mutual access between these two groups of banks be of interest now?

Indicative answer: *There are two ways this can be achieved. Firstly the cooperation could be emerge as a result of technological advances or changed behaviour of customers, who require more frequent access to bank services remotely, such as cash machines or bank service points. In this case, it is optimal for banks to offer better access to such services as the increased competition between banks and the resulting higher deposit rates is outweighed by the ability to attract customers because of the access to a large banking network, in this case by cooperation between mutual and savings banks. Such cooperation to the benefit of customers could also emerge if the banks could agree a fee for customers to access such services at each other's banks. Such a fee would make the cooperation beneficial to banks as the additional fee income compensates them for the increased competition between them, which increases deposit rates.*
Model(s) used: Ch. 19.1.1

Problem 208

Consumer groups complain that banks do not offer sufficient access points for banking services, especially in rural areas. They commence a campaign for banks to provide more electronic kiosks, accessible to customers of all banks, offering access to cash, advice through secure video links, and other services, but banks refuse to do so as they claim this is not cost-effective, despite the fact that banks are paid a fee for customers of other banks using their access points. Banks demand a subsidy to cover the costs of such access points.

Would a subsidy be effective in providing more access points to banking services for customers?

Indicative answer: *A subsidy would reduce the costs of providing each access point, and while this increases the socially optimal number of access points and the reduced interchange fee banks pay each other for the use of each others' access points, it will increase the number of access points. This increase in access points provided by banks is more than the increase of the social optimum and hence, the subsidy would result in a number of access points closer to the social optimum than before.*
Model(s) used: Ch. 19.1.2

Problem 209

A group of three banks agrees to provide banking kiosks across the country from which basic banking services can be conducted by their customers; most of these kiosks are located in existing bank branches. A few months later, another group of three banks joins together offering the same service. It is after a number of years that these six banks join forces and allow access to all their customers at all their banking kiosks. However, a large number of such banking kiosks are closed, leaving only slightly more kiosks in operation than before two bank groups allowed access to each other's facilities. Many commentators see these closures as a sign of lacking competition due to banks colluding in withdrawing services.

Is this view justified?

Indicative answer: *The withdrawal of banking kiosks is not a sign of banks colluding but a result of having an excessive number after they have been made available to customers of more banks. While it might have been optimal before to have this number of banking kiosks as those belonging to the same group were further apart than they would be now that customers have access to any banking kiosk. Given the costs of operating such kiosks, it would therefore be optimal to reduce the number of kiosks, still resulting in a higher density of banking kiosks before the merger.*
Model(s) used: Ch. 19.1.2

Problem 210

Banks have for a long time cooperated to provide remote access to banking services for all their customers, initially through cash machines and then through banking kiosks and now through the provision of a banking hub, where in a dedicated building facilities for all banks are provided. These remote access points have initially increased significantly, but since the advent of internet banking have reduced again.

How can you explain this initial increase in the number of remote access point and the subsequent reduction?

Indicative answer: *If the costs of providing these remote access points reduces over time, as is reasonable to assume, then their number would have increased. This will explain the increasing number of remote access point in the initial phase. It is unlikely that these costs will have increased, even with the increase in banking hubs. However, the advent of internet banking will have made the costs of not having access to kiosks lower and given the convenience of internet banking from home will have increased the costs of visiting one to the remote banking services, making it optimal for banks to reduce their number again. It is thus that the initial increase in number of facilities was driven by the lowering costs to banks offering these and their withdrawal was driven by the increased relative costs of customers visiting them.*
Model(s) used: Ch. 19.1.2

Problem 211

Through legislation, the seven nationally operating banks are required to retain access to a physical branch in every town exceeding 25,000 inhabitants and locally operating banks have to do so in every town with more than 10,000 inhabitants within their local area. How such a physical branch operates has not been determined and it has been found that some banks share facilities by operating counters next to each other in a single building, or even offering only a single counter where all banks are represented. The nationally operating banks have formed three groups that in larger towns share a branch and are often joined by local banks; in smaller towns it is often only the local bank being present, although in some instances one of the groups of nationally operating banks are represented, too. For fear of falling foul of competition law, banks share costs of these branches, but they do not conduct the transactions for each other. However, in a clarification, the competition authority has made it clear that it would not regard it as an anticompetitive measure if a bank cooperates with another bank to conduct its business at a branch where they both are represented, as long as the bank conducting the business on the other bank's behalf is adequately compensated. Before this ruling, towns had at least three bank branches from each of the nationally operating banks, and in some cases there were four with a local bank operating alone; since that ruling, most towns only have a single branch, although some have retained two branches, but they are all offering access to all banks.

Why has this ruling caused such a change to the branch network?

Indicative answer: *Prior to the ruling, banks were only partially cooperating in the operation of the branch networks, thus was presumably optimal given the demand for such services and the associated benefits as banks did not seek to compete too aggressively and reduce profits. The ruling then has changed the behaviour of banks in that they were allowed to pay access fees, or an interchange fee. This creates additional revenue for banks to conduct the customer business on behalf of the other bank. The result is that all banks are fully cooperating and we have in principle a single branch in each town. However, customers might find it more attractive to have banks in different locations, so not all branches in excess of the minimum requirements were removed, but some were retained.*
Model(s) used: Chs. 19.1.1, 19.1.2

Problem 212

Viggo Pedersen is an economic consultant to the finance ministry and his main focus is on the banking sector. For a long time he has criticised the lack of competition between banks. One result of this low competition between banks, in his view, is that they are very conservative and introduce innovative banking services and innovative ways of providing such services only with substantial delay until there is a clear demand by customers, especially in cases where such changes would increase competition between banks. As he once put it, 'It is not banks that drive innovations, banks are forced to adopt innovations.' As a result he has long promoted ideas to increase competition between banks. Banks, on the other hand, cite concerns about the safety of innovative ideas that necessitate a long development phase and then subsequent testing.

Is there merit in either Viggo Pedersen's assessment of bank competition or the bank's stance that safety concerns delay the adoption of innovative ideas?

Indicative answer: *The level of competition between is irrelevant for the adoption of new banking technologies, high levels of competition affect the level of profits banks are making and the introduction of innovative ideas will not affect directly affect the competition between banks itself. What drives the decision to introduce an innovative service or a new way of delivering services is the demand. If the demand is increasing, it offers the change for a bank to differentiate themselves from other banks by offering it and thereby increasing their market share at the costs of those banks not offering these new services or delivering their services only in traditional formats. If such innovative services are increasing competition, banks would weigh the increased market share against the increased competition. Once the demand is*

sufficiently high, banks not offering a new service would lose too much market share and despite the increase in competition offer it. There is no concern about the safety of innovations, this is only brought up by banks as a justification for not offering the service, not the actual reason.
Model(s) used: Ch. 19.1.3

Problem 213

Bank customers have become used to having banking apps on their phones, but as each bank has their own app, it has become difficult for some customers with accounts at different banks to keep an overview over their account balances and payments in deposit and savings accounts across banks. The use of multiple apps is made even more difficult by banks having different log-in processes, different layouts of apps, and different ways of using the services offered in apps. Velia Inc. has developed an app that allows to manage all accounts by accessing the apps of individual banks and then use a single interface to access all relevant information and conduct transactions. This app has been offered to banks previously but it had been rejected by them as not being needed as their customers were satisfied with the app they were currently provided with. However, with customers becoming more and more aware of different offers of banks and opening more accounts to take advantage of these features, Velia Inc. believes their app is more important than ever.

Is the app, or a similar app, likely to succeed in the future?

Indicative answer: *The app requires the cooperation between banks to provide access to this app, otherwise it will not become widely used. Such cooperation between banks is only forthcoming if the demand by customers is sufficiently high, that is not providing access to its account on the app would give it a competitive disadvantage in attracting customers. The more inconveniences customers are by the lack of such an app allowing them an overview of all their accounts, a high cost in its absence, the more likely banks are to agree sharing the information with this app. It is thus that once demand is sufficiently high and the inconvenience to customers of not having the app becomes high, a small group of banks will see it beneficial to cooperate and offer access to the app, getting a competitive advantage over other banks. As the app will make it easier to compare conditions of accounts and transfer funds, it will increase competition and thus erode the profits of banks. It is thus only once the demand is sufficiently high and/or the inconvenience substantial that all banks will allow access to the app.*
Model(s) used: Chs. 19.1.1, 19.1.3

Problem 214

First Trust Bank Inc. has traditionally appealed to older and more conservative customers that value a personal service in conveniently located branches near town centres. In contrast to that InnoBank plc. has a reputation to be at the forefront of technological advances and offer the latest innovations at the costs of abandoning traditional ways of banking. It is therefore mostly attracting younger customers who rarely visit the bank but prefer to interact online through apps and chats; for this reason they have no branches. Management consultants have been asked by both, First Trust Bank Inc. and InnoBank plc. to assess their strategy and suggest ways of increasing their respective market shares. With both banks being the main banks available to customers, management consultants in First Trust Bank Inc.'s case consider suggesting to offer online banking facilities, while for InnoBank plc. they contemplate the opening of traditional branches.

Would these suggested strategies be beneficial to either bank?

Indicative answer: *Taking one view, in order for the strategy to increase profits, there needs to be sufficient demand for the innovative services from those banking with First Trust Inc. and sufficient demand for branches in the case of customers from InnoBank plc. Both is unlikely to be the case with their own customers and hence there is no benefit from doing so. However, these services are attractive to those customers at the other bank and hence they might attract customers. However, it needs to be jusdged how likely customers are to switch banks for such a strategy to be beneficial. If it is a case of each bank attracting customers of the other bank, there will only be an increase in competition with no benefit for either bank. It will thus depend on whether one bank will find to make this move profitable with the aim of attracting customers of the other bank. This will increase competition between banks and reduce their profits, so the increased market share needs to outweigh this effect. Whether the other bank then reacts by seeking to attract new customers, too, will depend on the degree of customers they lose and how likely they are to attract new customers.*
Model(s) used: Ch. 19.1.3

Problem 215

Kim Song-yan complains about the behaviour of his bank. He is on a low income but lives frugally and manages to save small amounts every month to cover the costs of unexpected expenses, such as repairs to kitchen goods or his small car; every month his bank charges him KRW 10,000 for his current account. In contrast to that, he knows through friends that Hwang Ye-yun, proliferate spender, who is on a much larger income and is constantly battling debts, pays only a nominal fee of KRW 500. Kim Song-yan acknowledges that on the two occasions in the last 5 years he had to relay on a loan, one to replace his car and the other when his washing machine and fridge broke down within days of each other, he paid interest of only 7.5% p.a., while Hwang Ye-yun usually pays 10 or 11% p.a., but he attributes this to him being the more prudent one and posing less of a risk to his bank. He complains that banks are supporting reckless spenders over those trying to make ends meet.

Is he right in his claim that banks prefer spenders like Hwang Ye-yun and for this reason charge him a higher fee to maintain his account?

Indicative answer: *Banks will charge Hwang Ye-yun a lower account fee as they can make additional profits from his lending, while Kim Song-yan does not generate much income for the bank from loans. However, in contrast to claiming that the higher loan rate is only due to the higher risk Hwang Ye-yun poses to the bank, it could also reflect a different pricing strategy by the bank in that it will charge Hwang Ye-yun a low fee but high interest on loans, while for Kim Song-yan the loan rate is lower, but the bank generates its income from the account fee.*
Model(s) used: Ch. 19.1.4

Problem 216

Kreditbank AG offers customers free current accounts, while the Volksbank Murrenningen eG charges a fixed fee of €7.50 per month. Your friend says that it is a no-brainer where to open a current account, while you believe that the market will ensure that you are not overcharged if opening an account with the Volksbank Murrenningen eG.

Are you correct in your assertion?

Indicative answer: *If we assume that these two banks are competing such that the profits they generate from customers are identical, then it would indeed be irrelevant where you open your account. The fee charged by Volksbank Murrenningen eG will be offset through better conditions for other bank services, for example when requiring a loan, the loan rate might be lower than at Kreditbank AG. This lower loan rate, or lower costs for other services, should offset the higher account costs.*
Model(s) used: Ch. 19.1.4

Problem 217

'Banks give to the rich and take from the poor. Just look at Salaris Bank's fees: €10 per month for accounts with an average balance below €5,000, €5 for averages balances between €5,000 and €20,000, and no fee for average balances over €20,000. This is just an example, which normal person has even €5,000 in their bank account?. We all know why they do this, rich people easily switch banks, while poor people lack the knowledge and the time for that.' This was the comment of

Alessandro Novelli from the left-wing party Ala Sinistra. He carries on with his criticism of banks and that they need to be brought to heel and develop a social conscience.

Are banks exploiting the fact that poorer depositors are less likely to change banks in response to higher fees?

Indicative answer: *It is not the ability or willingness to switch banks that drives this results. It is simply that larger deposits are more attractive to banks as they will generate more profits by the simple fact that they are larger. It is therefore that banks seek to compete for these deposits and charging a fee would not be optimal for them as another bank could easily undercut their fee and obtain deposits from them. For smaller deposits, the same possibility exists, but as the deposits affected are smaller, the losses from losing these deposits affect their profits less and hence they maintain a higher fee.*
Model(s) used: Ch. 19.1.5

Problem 218

Banks in Zamek are seen to be highly competitive, while in neighbouring Palak two quasi-monopolistic banks enjoy government protection from competitors. However, many see the banking system in Palak as fairer, because every customer has to pay the same fee for their account, while in Zamek such fees are only paid by those with small account balances and their fees are higher than in Palak. The Banker's Association in Zamek disputes that the high fees for small depositors are unfair and point to the high degree of competition between banks, who would have eroded any such fees if they were not justified.

Why do small depositors in Zamek pay higher fees than those in Palak, while large depositors pay no fees in Zamek?

Indicative answer: *The reason is actually in the different levels of competition. In both cases banks are attracted to large deposits and primarily seek to attract them. However, with lower competition between banks in Palak, they are not lowering account fees to attract these larger deposits as this would reduce their revenue without increasing the amount of deposits significantly, reducing profits overall. In contrast with more competition, banks are more aggressively competing for deposits and seek to increase their market share through lowering account fees. However, to compensate for the reduced income from this competition, they increase the fees on small deposits who are less attractive and thus less competed for. Hence the differences in the charging for accounts is actually the result of different levels of competition between banks, benefitting large depositors to the detriment of small depositors.*
Model(s) used: Ch. 19.1.5

Problem 219

Analysing the fees bank charge for current accounts for a consumer magazine, you observe that banks charge higher fees to customers on low income, with wealthier customers often charged lower fees or no fees at all. However, you also find that, relative to their risk, low-income customers face lower loan rates than wealthier customers; these lower loan rates do not fully compensate for the higher fees, however.

How can you explain these observations?

Indicative answer: *Banks seek to make adequate profits from customers and this will be a combination of fee income and the income from the provision of loans, we can thus see banks having different strategies on how they achieve this. Some banks will charge higher fees, but then offer loan rates, while other banks might charge lower fees and then offer only higher loan rates. In principle these two effects should offset each other. However, there is an additional effect in that only small deposits get charged a fee, while larger deposits are not. This is due to the competition of attracting large deposits, which due to their size are more attractive than small deposits. Combining these two effects, we see that customers with large deposits, on average, face lower costs than those with small deposits.*
Model(s) used: Chs. 19.1.4, 19.1.5

Problem 220

Everyman Ltd. has as its aim to provide access to credit cards for everyone and issues these through banks mainly to customers on steady, but low incomes. At the opposite end of the market, the Cardinal Diamond credit card, issued by Cardinal Inc. is available exclusively to customers with incomes in the top 1% of the population. While Cardinal Diamond credit card is universally accepted in nearly all shops, the cards issued by Everyman Ltd. can only be used in selected shops. Those shops not accepting Everyman credit cards are frequently accused of snobbery as they do not want to sell to customers of low incomes.

Is there an alternative explanation for the reluctance of shops to accept Everyman credit cards?

Indicative answer: *Everyman credit cards are issued to customers on low incomes and thus after making purchases the credit risk to the Everyman Ltd. will be significant, while for those customers obtaining the Cardinal Diamond credit card they high income will make defaults unlikely. This higher default risk of Everyman Ltd. will result in shops (merchants) being charged a high fee to ensure the bank does break even. This higher fee may make it not profitable for shops to accept this card as their profit margin might not be enough to cover these costs. The much lower default risk on the Cardinal Diamond credit card will result in a lower fee charged to shops and hence their profits are unlikely to be full;y eroded, making them more willing to*

accept this card.
Model(s) used: Ch. 19.2.1

Problem 221

It has become a talking point among shop owners that for many years all major credit cards have increased the fees they are charging shops accepting them as payments. As credit cards have become ever more widespread, once the preserve of the wealthy and now available to people even on lower than average incomes, not accepting them has become a drain on sales, while accepting them drains their profit margins. The Association of Retail Shops has urged the government to conduct an investigation into the behaviour of credit card firms and their abuse of the market power they have.

Will such an inquiry likely show that credit card companies are exploiting their widespread use by increasing fees to shops or is there an alternative explanation?

Indicative answer: *With the availability of credit cards increasing to customers with lower and lower income, the credit risk to the issuers of credit cards increases. This is because low-income customers are commonly seen as more risky and these risks the banks seek to cover through the fee they charge the shops as no interest income is generated. It is this lowering of income requirements and thus increase of risks that have contributed to the increase in fees over time. This might explain the observation, rather than an abuse of market power.*
Model(s) used: Ch. 19.2.1

Problem 222

A major selling point for banks when seeking to attract depositors is the availability of credit cards at no costs. However retailers complain that while buyers benefit from an interest-free time period, they are charged exorbitant fees by their bank to accept credit cards and finance the purchase of their customers. The banks defend the charges to retailers by the fee they are charged by the bank of the card issuer for initiating payments to the retailer.

Why is the fee charged to retailer so high?

Indicative answer: *The sensitivity of depositors, those using their cards to make purchases, makes it impossible to charge them a fee; competition for their custom, through bank accounts will cause this outcome. The costs of the bank issuing the credit card will be covered by the interchange fee without a contribution by the depositors (purchasers) and this interchange fee is then a costs to the bank of the retailer, who will have to recover it through its fee to the retailer, in addition to their own costs. It is therefore that the retailer has to bear the full costs. It is that the low*

sensitivity by retailers to such costs due to fearing to lose sales is responsible for them bearing the full costs of issuing payment cards.
Model(s) used: Ch. 19.2.2

Problem 223

With new banks entering the market in Gramedon, competition for deposits between banks has increased with depositors benefitting from increased services and easier access to account benefits. Once the preserve of a few privileged customers, competition has forced banks to offer credit cards to an increasingly wider range of their customers as part of the account package without being able to increase account fees. In contrast to this, banks in Laurentia are not competing as fiercely as in Grameda and account packages that include credit cards are usually attracting a higher account fee. Retailers in Gramedon complain about the high costs of accepting payment cards despite the competition between banks, where banks are also competing for their custom, noting that the costs of retailers in Laurentia are much lower.

Why are costs for retailers to accept card payments in Grameda higher?

Indicative answer: *It seems that competition for depositors between banks in Grameda has made it impossible to charge a fee for credit cards to depositors and it is therefore reasonable to assume that their sensitivity to any banks doing so will lead to them switching account to another bank; this will then the issuing bank to recover any costs through the interchange fee, which the banks of the retailers will turn charge to them. In Laurentia, however, it is common for depositors to pay a fee for credit cards, at least indirectly through account packages, thus they seem to be less sensitive to these fees and the issuing will charge a lower interchange fee and thus the banks of the retailers will have less costs to charge retailers, making the fee lower. It is thus that competition between banks in Grameda causes the costs of credit vards to be charged to retailers rather than depositors as in Laurentia.*
Model(s) used: Ch. 19.2.2

Problem 224

In order to attract new customers, Harrier Cards plc. has introduced a new credit card, the Harrier Basic. It is aimed at young professionals at the start of their careers, while its main product the Harrier Executive is aimed at those in mid-ranking and higher professional positions. The new Harrier Basic is offered with higher credit limits than other comparable cards, but an annual fee of \$100 is charged, while the credit cards of competitors are usually provided free of charge. Retailers are charged 0.2% of the transaction value with a minimum fee of \$0.25 per transaction, this fee is comparable to other credit cards, including the Harrier Executive.

Why is the charge to retailers for the new credit card similar to that of other cards?

Indicative answer: *The credit limit on the Harrier Basic is higher than that of competitors, which implies that Harrier Cards plc. faces higher credit risk. This higher credit risk needs to be recovered through fees, which are typically charged to the retailer, implying that the fees should be higher. However, the credit card comes with an annual fee and this additional income that accrues to Harrier Cards plc. will not have to be recovered through the interbank fee, reducing the fee to retailers such that its is comparable to other cards. This arrangement is only possible if depositors are not very sensitive to the price of credit cards, which is reasonable to assume here as the credit limit on the Harrier Basic is higher than other cards, making it more attractive to the target market.*
Model(s) used: Chs. 19.2.1, 19.2.2

Problem 225

Ophira Bank plc. offers current accounts that feature unlimited account transactions and access to the Ophira credit card, issued by its own credit card subsidiary and equipped with a credit limit of 3 monthly salaries, for a monthly fee of $12. In addition, they quote a typical loan rate for an average borrower of 7.75% p.a. For more price sensitive customers, they also offer a conventional account, comparable to the conditions found at most other banks, with a monthly fee of only $3 and they offer a credit card by Remark with a credit limit of 1 monthly salary; with this account the typical loan rate would be 8.5% p.a. While many customers found the account featuring a $12 fee attractive, they soon found that many shops they went to were asking them if they had another card they could pay with instead. This left many customers confused and writing to newspapers about their experience, an expert on banking explains the reasons for their experiences.

What would this explanation be?

Indicative answer: *First, the different account fees need to be explained and the implications be discussed. The high-fee account comes with the benefit of a higher credit card limit and lower loans rates. Now it can be proposed that the additional fee income of the banks accounts for the lower loan rate and is not a fee to pay for the benefits of the credit card. If that is the case, then the higher limit of the credit card on that account is imposes a higher credit risk on Ophira Bank plc., which needs to be recovered through fees. If we assume that the fee mostly pays for the lower loan rate that is offered, then the only way to recover these higher costs is through a higher interchange fee which is charged to the banks of the retailers, who in turn will charge this fee to the retailers. The lower risk of the Remark credit card will have a lower risk and hence the amount that needs to be recovered from the retailer will be lower, making this card cheaper. It is thus that retailers know that using the Ophira card imposes higher costs on them, reducing their profits, they ask customers to use*

another card which has lower costs.
Model(s) used: Chs. 19.1.4, 19.2.2

Problem 226

Jyrki Salminen complains to his bank that the payment to a friend he submitted last week had not arrived for three days, while payment by his brother for the same amount to the same person submitted just minutes earlier did arrive the next day. The bank employee points out that Jyrki Salminen is on a basic account which charges no fees and while he is not allowed to divulge details, customers on fee-paying accounts obtain priority when making payments. Jyrki Salminen is not satisfied with this response as he believes that it makes no difference how long a payment takes to be credited to the recipient's account.

Why could it matter that Jyrki Salminen's account does not charge a fee, while his brother is charged a fee?

Indicative answer: *If a bank does not receive a fee for making the payment, it faces no direct costs in the form of lost revenue from withholding the payment for a while, while those paying a fee for such transactions expect payments to be made promptly, hence delaying these payments can result in the loss of revenue to the bank. It will therefore be that banks prioritise these payments over those that are conducted for free. It is not efficient for the bank to hold higher cash reserves as making the payment by Jyrki Salminen in time does not generate the bank and revenue, while that of his brother does.*
Model(s) used: Ch. 19.3.1

Problem 227

Commercial Bank plc offers its customer two form of payments to accounts at other banks, the standard payment costs TWD 10 and the payment will reach the recipient within 4 working days, while the fast payment costs 1% of the payment value with a minimum fee of TWD 1000 and is guaranteed to reach the recipient the next working day.

Why is the fast payment more expensive than the basic payment?

Indicative answer: *In order to make payments, banks have to hold sufficient cash reserves, which is costly. If the payment is paid for by a sufficiently high fee, the fee income outweighs these costs and the payment is guaranteed to be made. However, payments that attract only a small fee will not cover the costs of holding additional cash reserves and it might therefore not be able to conduct this payment, it will may be delayed until the bank needs to make less payments and sufficient cash reserves*

are available.
Model(s) used: Ch. 19.3.1

Problem 228

Calpurnia's banking system has matured over the last 20 years. Through regulation based on more advanced economies and strict requirements in the qualifications of senior bank managers, the risks of banks have not only declined overall, but the widely varying levels of risks banks took, often out of ignorance and poor management decisions, have also reduced. While banks are still taking different risks due to different target markets, these risks are adequately managed and it is mostly known which risk levels banks accept when providing loans. As part of the modernisation of the banking system and in reaction to significantly increased payments between accounts held at different banks, the banking regulator considers a significant change to the way payments between banks are settled.

Is Calpurnia's banking system in a phase where the transition from the current gross settlement system to a net settlement system should be made?

Indicative answer: *The evidence suggests that Calpurnia's banks have changed significantly in the last two decades. While the risks they took previously was not only high but also varied hugely between banks,this is not lower and, evenly important, the differences of risks between banks are reduced. These two aspects favour a net settlement system that has lower liquidity requirements, allowing banks to provide more loans and promoting economic growth. The restraints on banks providing high-risk loans due to these higher liquidity requirements, will also become less desirable as overall these risks have reduced.*
Model(s) used: Ch. 19.3.2

Problem 229

Banks lobby the regulator to allow them implementing a net settlement systems for payment between them, a move that is opposed by consumer groups. Even as banks point out that the lower liquidity requirements with net settlement will allow banks to pay higher deposit rates as they can provide more loans, making them more profitable and allowing them to distribute some of these profits to depositors, consumer groups remain opposed.

Why do consumer groups oppose this move to a net settlement system?

Indicative answer: *Banks have to hold less liquidity reserves in a net settlement system compared to a gross settlement system, this also means that banks might take more risks by providing more loans; if these increased loans are high-risk this is*

not necessarily good for depositors. They might see higher liquidity requirements in gross settlement systems as beneficial to their returns on deposits with poorly performing banks performing less poorly. This will have to be weighed against the benefits of potentially higher retuirns from low-risk banks, but ina situation where high-risk banks are taking substantially more risks than low-risk banks and they are relatively common, a net settlement system is detrimental to depositors overall. It is most likely this scenario that leads consumer groups opposing the move to a net settlement system.
Model(s) used: Ch. 19.3.2

Problem 230

Natufian has a nascent financial system where banking services are only emerging and bank managers lack experience. The system to settle payments between banks is inefficient as banks use different IT systems that are not compatible and payments are advised by phone message and recorded by hand in some instances, making it subject to many errors. Attempts to link banks electronically have failed due to the high costs involved. Apart from the local banks, there are two foreign-owned banks that have a very good understanding of the banking system and the challenges local banks face, probably a better knowledge than the local banks themselves; in addition they have an IT system that is broadly compatible with most local banks. At the reception of the governor of the central bank, the heads of these banks suggest to improve the payment system in Natufian.

What would their suggestion be?

Indicative answer: *The foreign banks may suggest that they act as clearing banks to support the payment system. There is evidence to suggest that the foreign banks have a good understanding of the local banks and should therefore be able to identify those that will face liquidity constraints in the near future. In addition, they have a cost advantage in that they have an IT system that is compatible with local banks, or could be made compatible at relatively low costs. This would allow to settle payments more efficiently. As the cost advantage of the foreign banks is substantial it will probably be that all payments between banks are conducted through them.*
Model(s) used: Ch. 19.3.3

Problem 231

In the early stages of the development of Yavoi, payments between banks were conducted through clearing banks, that were specifically established with government support for this purpose after frequent liquidity shortages gave rise to delays in payment processing. However, over time liquidity shortages have become rare and the use of clearing banks has reduced, with many banks not using them at all and it has now come to the point where these banks propose to the central bank that they cease to offer the clearing service and banks will have to settle their payments directly.

How can you explain this change in the way payments are settled?

Indicative answer: *With government support, it is reasonable to assume that the clearing banks had distinct cost advantages over other banks and settling payments through them was beneficial, also to assess potential liquidity shortages by banks and prevent losses from payments not honoured. However, as Yavoi has developed its banks will have become more sophisticated and the probability of liquidity shortages has reduced. With technological advances, the costs of direct settlement will also have reduced for banks, even to the point where direct settlement might be cheaper than the use of clearing banks, which involves at least two transactions, from the banking making the payment to the clearing bank and from there to the recipient bank. Yavoi has thus moved from a situation where direct settlement was expensive to where it is cheap, resulting in this change. The role of clearing banks in identifying banks with a potential liquidity problem in the future might have haven been reduced with liquidity shortages becoming rare, undermining their other competitive advantage.*
Model(s) used: Ch. 19.3.3

Problem 232

Nearly all banks in Viguera are local banks operating in individual towns and some in entire regions, where these regions are more rural. The only nationally operating bank, Viguera Commercial Bank, is operating branches in virtually every town and region and as a tradition its branch managers collect systematically information on the economy in general within their respective areas, but their competitors, the local banks, in particular. That way they have established a good picture of all banks they are competing with. Ever since its formation as a national bank from a number of failing mid-sized banks in the aftermath of a previous banking crises, regional banks have conducted all payments between them through Viguera Commercial Bank. They cite that this is much more cost effective than making arrangements directly with other banks; while Viguera Commercial Bank charges a substantial fee for their services, the overall costs to local banks are lower than what they would face otherwise. Their own analysis has shown that the use of Viguera Commercial Bank reduces their liquidity requirements by more than half, which contributes to a significant reduction in costs.

How do you explain these benefits of making payments through Viguera Commercial Bank?

Indicative answer: *The cost advantage of using Viguera Commercial Bank makes them a clearing bank and all banks prefer using this clearing bank as the costs are lower than direct settlement. While the fee Viguera Commercial Bank charges local*

banks for this service is described as substantial, the reduction in required liquidity reserves outweighs these. These lower costs probably arise because with Viguera Commercial Bank they use a net settlement system, while with direct settlement a gross settlement system would be applied. The knowledge of Viguera Commercial Bank about local banks, and they are the only ones making and receiving payments, makes net settlement beneficial, while in direct settlement the local nature of banks will probably mean that significant uncertainties about the risk banks take are present, necessitating a gross settlement system, which requires higher liquidity reserves to be held.
Model(s) used: Chs. 19.3.2, 19.3.3

Problem 233

The owner of Nail & More Ltd., Lydia Provost, observes that payments submitted to her bank in the morning are in most cases not processed until later in the day and funds are available to the recipient only the next day. As a small business owner paying other small businesses for their specialist suppliers, this has given rise to disputes on several occasions where other businesses claimed the invoice was not paid on the due date. These disputes arose as suppliers mostly work with larger companies and their payments always come through in the morning.

Why are the payments made by Nail& More Ltd. frequently delayed?

Indicative answer: *Nail& More Ltd. is a small business and as such will not have much leverage with its bank. Delaying their payments until the afternoon will have cause little costs to the bank; a larger customer, in contrast, might complain and the perceived poor quality of service might lead to them losing the business altogether or having to provide compensation for the delay. It is thus that the costs of delaying the payments of Nail& More Ltd. are lower than the costs of larger companies and the costs of obtaining additional liquidity reserves to make these small payments are higher than the consequences of Nail& More Ltd. being delayed. For larger companies these costs are substantially more and therefore their payments are normally not delayed.*
Model(s) used: Ch. 19.3.4

Problem 234

The payment system between banks in Duklia used to frequently experience breakdowns in that no banks would process payments between customers in the morning, but all payments would only be made before the afternoon, leaving some customers without access to funds during the day, even though these had been sent early that morning. Such a situation usually occurred at times when liquidity was scarce in the banking system and interbank loan rates were unusually high. Banking specialists have commented that the gross settlement system is to blame for this situation as it requires high liquidity reserves.

Would switching to a net settlement system improve the reliability of Duklia's payment system?

Indicative answer: *A net settlement system would reduce the requirements for liquidity reserves, and might improve the blockage of the payment system. The lower liquidity requirements will make it less costly to process payments immediately as less liquidity reserves need to be retained, on average. It will not, however, avoid blockages completely. A full suspension of early payments may still occur, although it is less likely due to the reduced costs. However, what might occur is that some stop processing payments to save on liquidity reserves, while other banks will still process payments. It will be as likely that some form of delays remain in the payment system, but they will not often not be delays affecting all banks, but only some.*
Model(s) used: Ch. 19.3.4

Problem 235

In the early hours of the morning, for reasons not yet known, FTR Bank AD has stopped processing payments to other banks and at this stage it is unclear if it will commence making payments at a later stage in the day. While the news that FTR Bank AD has stopped processing payments spreads, all banks suspend the processing of payments between them. Alarmed about the paralysis in the payment system, the central bank seeks to reassure banks by pointing out FTR Bank AD is not a major bank and banks have sufficient liquidity to continue making payments in an orderly manner. This comment has no effect and payments between banks remain suspended.

What action might the central bank take to ensure that payments are processed again?

Indicative answer: *There are two elements that might help overcoming this liquidity crunch. The first is the costs for banks delaying the processing of payments; here the central bank can increase these costs through statements to the effect that there is no reason to stop processing payments, leading to reputational loss if they do so. They may also be able to promise central bank loans to those who continue processing payments at preferential rates in the future, while those stopping processing payments will have to pay a higher rate; this increases the costs of stopping the processing of payments. The second element is the costs of banks failing if FTR Bank AD does not commence making payments and due to not receiving their payments, a bank faces a liquidity shortage. The central bank can intervene here by committing to provide any bank in that situation a central bank loan, allowing to avoid failure. It is thus not enough to point out that there are enough liquidity reserves in the banking system, but the bank might have to affect costs of banks through measures that gives them*

sufficient incentives to continue processing payments.
Model(s) used: Ch. 19.3.5

Problem 236

Two banks have experienced the sudden and unanticipated withdrawal of deposits from large depositors abroad. The reason for the withdrawal of deposits is not yet known and rumours about the two affected banks facing large losses are as much spreading as an explanation that the depositors were rebalancing their international investment portfolios. The central bank is known to be in discussion with these two banks to provide liquidity support and until these talks have finished all payments from these two banks are suspended. It is well known that the central bank has a clear policy of only providing liquidity support to banks that are financially sound and its initial reaction has made it clear that there is no intention to deviate from this policy. At the same time the central bank reiterated that the banking system overall has sufficient liquidity to commence operations as normal. Despite these reassurances, banks stop processing any payments between them. Noticing this development, the central bank contacts banks again more confidentially and makes it clear that even though some banks might face a liquidity shortage due to the lack of funds arriving from the two affected banks, the overall liquidity reserves are sufficient to continue with making payments as scheduled and the central bank will not provide additional funds.

How can be ensured that payments between bank are processed again?

Indicative answer: *Banks face a liquidity crunch; they have sufficient liquidity to make any payments now but are concerned about the lack of payments from the affected banks such that at a later time they might face a liquidity shortage. For this reason they stop processing payments now to preserve liquidity and avoid failure at a later stage. As there is no question about the stability of the unaffected banks, this is a pure liquidity shortage, or anticipated liquidity shortage. Overall there is also sufficient lliquidity in the banking system to process payments as necessary, it might just not be at the right place. Without the central bank providing additional liquidity, banks can resort to interbank loans to redistribute liquidity within the banking system as needed.*
Model(s) used: Chs. 16.2, 16.3, 19.3.5

Problem 237

Inflation in Debarth has increased from 6% p.a. two months ago, to 9% p.a. in the previous month, and the latest publication of figures will show that inflation increased further to 14% p.a. The central bank sees this development primarily as the result of wage increases agreed between employers and trade unions in recent months on the back of a booming economy. Having hesitated previously, they now decide to increase the lending rate to banks from 7% p.a. to 15% p.a. No one foresaw an increase of the interest rate by the central bank of this magnitude and as the announcement is made at 8am before business commences, some banks react by suspending the processing of payments customers have initiated, although the majority of banks initially continue to conduct their business as usual. As soon as it becomes known that some banks have suspended their payments temporarily, all other banks also suspend processing payments. Seeking a briefing about the reaction of banks, the governor of the central bank asks for an explanation on the causes of these developments.

What would this explanation contain?

Indicative answer: *The sudden and unanticipated increase in the interest rate has made borrowing from the central bank much more expensive. These higher costs has led some banks to to suspend processing payments in order to save liquidity; they are able to do so as they might not have to seek a central bank loan to increase their liquidity reserves. This increase in costs to obtain liquidity, if needed, outweighs the costs of delaying the payments, such as reputational loss with customer or compensation payments. Clearly, this was seen as preferable only by some banks, most likely dependent on the type of customers they serve, with those serving individuals less affected than those serving large companies. This suspension of payments by some banks has then caused concern with banks who are not receiving the payments from these banks, causing them a liquidity shortage. They then have themselves sought the save liquidity for future payments and avoid liquidity shortage then, even though now they have sufficient liquidity to continue processing payments.*
Model(s) used: Chs. 19.3.4, 19.3.5

Problem 238

A panel discussion on the challenges in regulating banks has for most of the time focussed on credit risk and the adequacy of capital to cover such losses and how it should be adjusted to account for the risk appetite of banks. It is only towards the end that Vasileos Varakianis seeks to introduce a different point by provocatively stating 'The main risk these days is coming from loans, securities, property, and whatever fancy assets banks might get into, this is well regulated and monitored. What we have not paid any attention to here, and most regulators don't either, is the risks arising from the liability side of banks. I know that those without a banking background might find it strange to talk about risks from liabilities, but I think these are not only overlooked, but also poorly understood.'

What risks might Vasileos Varakianis have referred to?

Indicative answer: *There are four main risks for banks associated with liabilities and indirectly they all impact liquidity, but in a much less manageable way than in non-*

bank companies. Liabilities of banks are typically short-term and can be withdrawn at any time, while assets, loans and other investments, are to a large degree long-term and relatively illiquid. The main liabilities of a bank are its deposits. Here the risk of a bank run is ever present if depositors only change their expectations about the stability of a banks, or even their expectations about what other expect about the stability of a bank. The same problem is also present with interbank loans, which for some banks form a major source of funding, while for other banks their importance is minor. While interbank loans can be useful to overcome liquidity shortage, banks may also face a liquidity crunch if interbank loans are not extended. The same principle with repurchase agreements, they might also not be extended in what is a referred to a repo run. All these issues surround the sudden withdrawal, or absence of extensions, of loans to the bank by different parties, depositors, other banks, other institutional investors. Finally, deposits are not only subject to runs, transfer of deposits between banks as custom,ers make payments for goods and services can also lead to the failure of banks if payments cannot be made due to a liquidity shortage in other banks, causing failures to spread. Compared to credit risk and market risk, these risks are receiving much less attention and are less well undnerstood as well as less well regulated.
Model(s) used: Chs. 15.1.1, 16.4, 17.2, 19.3.4, 19.3.5

Problem 239

Looking at the interbank loan rates, the spread to the government yield curve is increasing with time to maturity, even though there is no evidence of the bank taking on additional loan risks for longer time horizons.

How can you explain this observation?

Indicative answer: *Particularly long-term interbank loans can be seen as an investment rather than the provision of liquidity to another bank facing a liquidity shortage. Such loans would commonly be agreed, depending on the benefits that this investment provides to the bank granting such an interbank loan and the benefits obtained for the bank receiving the loan. While the credit risk arising from the provision of loans and the therefore possible failure of banks has to be included in this calculation, it would lead to a a constant difference to the yield curve of government bonds, with the stated assumption that these risks are not increasing. What needs to be included in the interest agreed, however, is the possibility of a bank run and the subsequent failure of the bank for that reason. The longer the time to maturity, the higher the chances of such a bank run as it gives more time for self-fulfilling expectations to form.*
Model(s) used: Chs. 15.3, 16.1

Problem 240

Competition between banks has eroded any account fees charged to depositors and basic bank services, including transfers between banks, are free. Compared to a time previously when fees were charged for each transaction, the public perception is that the service banks provide, has deteriorated. It is often that transfers to other banks by a customer is not acted upon promptly, increasing the average time until a payment is received from 2 days many years ago to over 4 days now. Banks blame the outdated gross settlement system for these delays and point out that they have been lobbying for the switch to a net settlement system for years. The central bank has refused such a step pointing out that some banks take, in their view, excessive risks, and higher liquidity reserves are reducing these risks.

Would such a switch to a net settlement system improve the transfer time between banks and be generally preferable?

Indicative answer: *The problem is with a gross settlement system that the low fee charged by banks, or in this case no fee being charged, provides no incentives for banks to make the transfer as it does not generate revenue. The bank will, however, incur costs when making a transaction as it needs to hold a liquidity reserve to be able to make payments, which is costly to banks. Switching to a net settlement reduces the costs as incoming payments can be used to make payments, reducing the amount of liquidity reserves that banks are required to hold. In this sense it might help speeding up the payment. There are, however, downsides to a net settlement system in that the lower liquidity reserves required allow banks to provide more loans. This can be positive in the case that loans are low-risk and overall beneficial, however for high-risk loans that are socially not desirable, net settlement systems might be overall detrimental. It is thus that a net settlement system has its benefits, faster payments here, but might also have its down side in the expansion of high-risk loans the central bank is not supportive of.*

Model(s) used: Chs. 19.3.1, 19.3.2

Andreas Krause

Theoretical Foundations of Commercial Banking

This book provides readers with a comprehensive and state-of-the-art overview of the theories of banking. It presents theories on lending decisions and any conditions associated with it, as well as deposit-taking and the challenges such short-term funding poses to banks. We use a consistent and coherent framework in modelling bank behaviour that allows combining different theories to develop more comprehensive analysis of developments in this important industry. Going beyond the core activities of banks, this book also includes an analysis of the competition between banks, their employment practices and strategies. How banks can contribute to systemic risk will also be considered and the regulation of banks, partly introduced to prevent individual banks from failing and imposing losses on depositors, but also used to curb systemic risk. Finally some macroeconomic implications arising from the presence of banks in an economy are discussed.

This *accompaniment* to the textbook contains indicative answers to all problems, including references to the models that can be used to develop these answers.