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On competition and banking

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Chapter 10

Summary and conclusion

In this thesis we discussed several aspects of bank behavior under imperfect competition. As we argued in chapters 1 and 2, the loss of production and growth and the suboptimal welfare level resulting from imperfections in banking can only partly be explained by transaction costs and asymmetric information - the traditional justifications for financial intermediation. Empirical evidence suggests that banking markets are characterized by another imperfection: imperfect competition. Thus, the study of the strategic behavior of individual actors, i.e. banks, may yield further understanding of the functioning and development of banking markets. This issue is dealt with by the Industrial Organization (IO) approach to banking. In general, our study fits into this approach.

In chapter 1 we raised a number of important questions with respect to imperfect competition in banking that we aimed to deal with in this thesis. We grouped these questions into four sets, and treated each set or subtheme in a part of this thesis. The first part was concerned with the issue of competition in banking directly, summarizing the literature on the topic and showing how the competitiveness of banks can be measured. The second part focused on the theoretical modelling of imperfect competition in banking. In the third part, we assessed interest rate setting by banks, and in particular the responses to policy rate (or marginal cost) changes. Fourth, we addressed the issue of competition in banking from the banks' clients' (borrowers') point of view. This final chapter summarizes and concludes the study, presenting the main results of the different parts and indicating some general conclusions as well as suggestions for future research.

Summary

First, we discussed the issue of competition in banking by giving a survey of the literature on this topic in chapter 2. After discussing competition and its relation to market structure and treating different approaches to banking, we asked whether competition in banking is good or bad. On the one hand, standard IO literature suggests that strong competition is good in the sense that it leads to efficiency, low prices, and high welfare. On the other hand, though, the banking sector is special in many ways. In particular, a competitive banking sector is vulnerable to liquidity shocks which may lead to bank runs or panics. From the point of view of financial stability, some market power in banking may thus be desirable. In the second part of chapter 2 we reviewed the IO approach to banking. We discussed theoretical models of both quantity competition and price competition that have been applied to banks. Also, we examined various specific characteristics of banks that generally increase their market power, or make market power in banking particularly important. Finally, we reviewed empirical literature studying the competitiveness of banking sectors of various countries. The results from this literature suggest that competition in banking is imperfect in general, but below the level associated with a monopoly or perfect collusion.

As an illustration of this empirical approach, we estimated the competitiveness of the Dutch market for consumer credit in chapter 3. Before turning to the empirical analysis we discussed various methods that can be used to assess the degree of competition in a market. Our empirical results indicated that the Dutch consumer credit market was characterized by perfect competition. This conclusion deviates from the results of the above-mentioned literature. In particular, it differs from the results of studies of market power in banking sectors of several European countries (including The Netherlands), which commonly find evidence of monopolistic behavior or even collusive conduct.

In the second part, we turned to the theoretical modelling of imperfect competition in banking. We applied three oligopoly models from the standard IO literature to the banking case. That is, we incorporated into these models certain aspects that make banks special, i.e. different from ordinary firms. In our first two applications (chapters 4 and 5) we considered banks competing both for loans (outputs) and for deposits (inputs). In the third application (chapter 6) we argued that banks' marginal cost is determined (in part) by the policy rate set by

the central bank, and we studied the effects of monetary policy on bank behavior.

In chapter 4 we presented a general model, not focusing on the banking case, and described the effects of an industry-wide cost change in a Stackelberg leader-follower duopoly. The comparative static effects of such a cost change on the output of the firms indicated that although total output decreases after a cost increase, the individual output of the leader firm might *increase*. At the end of the chapter we reinterpreted the model and its result for the case of banks. There, the industry-wide marginal cost was interpreted as the policy rate set by the central bank. We showed that an increase in this policy rate may lead to the counter-intuitive effect that the leader bank increases its output in terms of the volumes of loans and deposits.

In chapter 5 we turned to double price competition, that is, banks competing in prices on the deposit market as well as on the loan market. The amount of funds that banks can lend is limited by their stock of deposits. In this context, we addressed the effects of the introduction of a reserve requirement. With such a requirement banks are obliged to hold a fraction of deposits as a non-interest bearing reserve at the central bank. This limits the funds available for lending. We argued that without a reserve, the equilibrium of the model may be inefficient in the sense that there is an excess stock of deposits and the lending rate is high. This occurs because if borrowers are not very responsive to lending rates, banks can exert market power and charge lending rates that are above the perfect-competition level. Then we showed that the introduction of a reserve requirement of a certain size may lead to a constrained efficient equilibrium without changing the lending rate. Since a reserve requirement decreases the excess of funds its introduction may force the bank to set its interest rate at the (constrained) perfect-competition level, thus achieving constrained efficiency.

Chapter 6 returned to the effects of policy rate changes, or more broadly the policy rate setting rule chosen by the central bank. The focus in this chapter was on the effect of the central bank's policy on banks' market power. The chapter can be seen as a microeconomic approach to monetary transmission or pass through, i.e. the response of bank lending rates to policy rate changes. It aimed to fill part of the gap that exists between the theoretical, microeconomic literature on market imperfections in banking and the mainly macroeconomic analyses of monetary transmission. In the context of a spatial competition model,

we analyzed interest rate setting by banks and the response of the banks' interest rate to the policy rate. We concentrated in particular on the banks' market power, i.e. their ability to charge a price (lending rate) above marginal cost (policy rate), which can be measured by the relative markup or Lerner index (the difference between the lending rate charged by the banks and the policy rate, as a fraction of the lending rate). Our results indicated that the Lerner index is negatively related to the policy rate, and thus a procyclical monetary policy implies a countercyclical movement of the Lerner index. Thus, the competitiveness of the banking sector may vary over the business cycle - due to the monetary policy rule. Also, market power in the banking sector as observed at a given point in time might be influenced by the central bank's policy rule.

In the third part of this study, we focused on bank lending rate adjustments following changes in an underlying interest rate. In particular, in chapter 7 we focused on the Dutch mortgage rate. We studied the responses of this rate to changes in the underlying interest rate (the capital market rate or the swap rate). We showed that these responses are asymmetric in the sense that the mortgage rate is more rigid downward than upward. An increase in the underlying interest rate is passed on to the mortgage rate faster than a decrease is. This finding is not unique to the Dutch mortgage market; other empirical studies suggest that the phenomenon of asymmetric price adjustments is widespread. We suggested various explanations for asymmetric price adjustments in general and discussed their validity for the mortgage rate in particular. From this, asymmetric mortgage rate adjustments may be explained in particular by tacit collusion, consumer search or switching costs, or varying markups over the business cycle. Other factors that may play a role in the mortgage market in particular are the prepayment risk (the risk that current clients may renew their mortgage and pay a lower rate if a bank lowers the mortgage rate), and the offer risk (which refers to the fact that a mortgage rate increase is not fully passed on to all future clients, because those clients with a non-expired offer may still obtain the mortgage at the old, low rate as specified in the offer).

Chapter 8 gave a theoretical background for an additional explanation of asymmetric price (or interest rate) adjustments. Firms may choose to offer a most-favored-customer (mfc) clause to their clients. With this clause, they promise their customers to reimburse the price difference if they lower their price within a certain period after the customer's purchase. Intuitively, one would expect firms offering the mfc

clause to be reluctant to decrease prices because of the cost of rebates incurred. This intuition was confirmed by our results. We found that prices respond more to cost increases than to decreases, that is, prices are more rigid downward in general. However, we showed that for some parameter values there will be more upward rigidity. This chapter thus gave an alternative explanation for asymmetry in price adjustments, where the asymmetry refers to more downward rigidity or, in some cases, more upward rigidity. Insofar as mortgage offers are similar to the mfc clause, these results also might help explain the empirical asymmetry found for the Dutch mortgage rate in chapter 7.

As a fourth issue, we considered the effects of imperfect competition in banking on the banks' clients, i.e. borrowers. In order to analyze this issue, chapter 9 turned to bank-firm relationships. In contrast to most of the bank relationship literature we did not analyze the optimal number of bank relationships for a firm or its relation to firm performance, but asked instead which bank a firm would like to borrow from. We presented a model in which firms first choose a bank to do business with. Then, they get a loan from their bank which they invest in a certain project, and they compete in the output market. The type of competition is not specified explicitly but a firm's marginal return to investment is assumed to be either decreasing or increasing in the other firm's investment in the equilibrium of the competition subgame. In this setup, we showed that competing firms prefer to choose the same bank, thus inducing a banking monopoly (at least for their sector). We explained this by referring to the commitment effect of choosing the same bank. A monopolist bank is capable of capturing a larger part of the firms' operating profits. But total operating profits will be higher when both firms borrow from the same bank, since a monopolist bank takes external effects of investment by a firm on the competitor's profits into account. Therefore, the monopolist bank ensures that the firms do not over- or underinvest. In the model of chapter 9, the latter effect dominates. Thus, we showed that banks' clients may actually prefer a less competitive (more concentrated) banking industry.

General conclusions and issues for further research

The above overview illustrates that we covered a wide range of different topics in this study. However, some subject matters come into prominence throughout larger parts of the thesis.

First, the IO approach to banking used in the greater part of this thesis is a fruitful one. By studying the behavior of individual banks it yields important insights into the functioning and development of banking markets. It adds to other (more macroeconomic) approaches to banking, which often treat the banking sector as a static, passive aggregate. Often, in these approaches, the banking sector is simply assumed to be characterized by perfect competition or monopoly. The sector is then modeled as an aggregate that is assumed to behave as standard theory predicts for a perfectly competitive (or monopolistic, respectively) industry. This ignores the fact that banks are different from ordinary firms in many respects and may not behave as in standard models. The IO approach to banking focuses on the strategic behavior of individual banks instead. It considers optimizing behavior and interactions among banks, and makes explicit how banks respond to each other. In particular, the IO approach thus takes imperfect competition (i.e. different degrees of oligopoly) in banking into account. Empirical evidence suggests that this is an important characteristic of banking markets. Incorporating it into banking models therefore may yield insights that could not have been obtained under the assumption of either perfect competition or monopoly often used in other approaches to banking.

Admittedly, the IO approach generally ignores some important issues in banking as well, such as the justification of financial intermediation. Also, new insights are sometimes derived using strict and perhaps somewhat unrealistic assumptions (e.g. the assumption that there are only two banks, as in chapters 4, 5, and 9). The strategic interactions involved in IO models often imply serious complications and therefore may force the researcher to resort to this kind of simplifications. Further, empirical testing of the models is hard in many cases because of both the aforementioned difficulties and the focus on the firm level, which implies that data requirements are difficult to meet. But, as we argued above, the approach allows for the development of simple theoretical models that can be used to analyze aspects of a variety of interesting (real-world) phenomena. In this way, it permits the development of intuition on a wide range of issues. This comes to the fore in particular in chapters 4-6 where we applied existing IO competition models to banking in order to analyze the effects of policy rate changes on interest rate setting by banks and competition among banks, and the effects of the introduction of a reserve requirement on interest rates and the efficiency properties of the resulting equilibrium.

Second, as a related point, we stress here once more that one should be careful copying insights from the general IO literature to banking. Sometimes, standard IO models can be straightly applied to banking. This is illustrated by chapter 4 where we developed results for a Stackelberg model of competition that could easily be copied to the case of banks. Even so, this is not always possible in general. One must be careful to take the specific nature of banks into account. For example, chapter 5 illustrated that banks competing in prices do not always end up in an efficient, zero-profit equilibrium where price equals marginal cost as predicted by the standard Bertrand model. Since banks are intermediaries, they compete in prices on both the input (deposit) market and the output (loan) market. This type of double Bertrand competition may well result in inefficiency and a price that is above marginal cost. This example illustrates that one should realize that a bank is special in various respects (e.g., it is an intermediary) and take care that any theoretical or empirical banking model includes the required specific characteristics.

Third, in this study we illustrated how microeconomic or IO models can be used to analyze monetary transmission. We focused predominantly on the response of bank lending rates to marginal cost, or the policy rate as set by the central bank. That is, we concentrated on the pass through of policy rate changes to bank lending rates. Obviously, the way in which banks determine lending rates is related to loan market competition and IO models of competition may therefore be helpful in studying how lending rates respond to policy rate changes. This approach was taken explicitly in chapter 6. Chapters 4, 7, and 8, which examine bank behavior in the context of policy or money market rate changes, are related as well.

Comparing this overview of our methods and main conclusions to the discussion of the literature on (the IO approach to) banking, it is clear that our study has its limitations. In chapter 2 we already argued that the IO approach to banking does not and cannot study all aspects of banking. Since this study fits into the IO approach, similar remarks can be made here. A comparison to the literature on the IO approach to banking itself also learns that we have left several important aspects of banking mainly undiscussed. For example, we did not model uncertainty, risk management, and asymmetric information in banking. Also, we did not incorporate network effects. Further, although we modeled product differentiation in chapters 6 and 8, the discussion in chapter 2 shows that

a lot more can be said about product differentiation and specialization in banking. Thus, including these issues in some of our models might yield further interesting results.

Several other topics for future research can be derived from this study. For example, the results of chapter 3 showed that the Dutch market for consumer credit is characterized by perfect competition, although several authors have shown that Dutch banks do have market power on other markets. Thus, it would be interesting to assess the competitiveness of various other banking (sub)markets, and in particular, to try to explain the observed differences. In chapter 6 we studied the effects of a monetary policy focusing on output stabilization, and indicated that it would be interesting to extend that analysis to the case in which the central bank is (also) concerned with price stability. Such an extension would more closely resemble the case of the European Central Bank (ECB) and might allow for an analysis of the effects of the start Economic and Monetary Union (EMU) and the ECB's common monetary policy on bank behavior. Also, our theoretical hypotheses on the relationship between monetary policy and bank behavior could be tested empirically. Chapter 9 provides another subject matter for further empirical research, predicting that competing firms may prefer to borrow from the same bank because this allows them to commit not to over- or underinvest. It is an empirical fact that competing firms often borrow from the same bank(s), and that banks sometimes specialize in certain industries. This is commonly attributed to informational advantages, but as our theoretical analysis suggests this may not be the complete story. Future research could yield insight into the empirical relevance of this argument, if it can find a way to distinguish empirically between informational and commitment effects.

The IO approach to banking covers such a wide range of banking issues (see section 2.4). However, one particular issue is likely to become increasingly important in the years to come. From the current IO-banking literature we have learned a lot on how banks compete and how they behave in particular circumstances. Also, the effects of bank competition on production, growth, and welfare have been studied. Despite this, research on the effects of bank behavior on banks' clients has remained limited. The current literature gives some insights into the effects on profits and welfare of borrowers, but the issue of effects of bank behavior on the strategic behavior of borrowers has hardly been touched upon. Exceptions are the studies by Spagnolo (2000), who argues that

collusion can spread from the banking sector to product markets; and Kildegaard and Williams (2002), who suggest that bank-based financial systems by favoring diversified borrowers imply higher industrial concentration. We also touched upon this issue when we argued that borrowing from the same bank may allow firms to commit to less aggressive competition in the product market (chapter 9). As we argued above, market power in banking does not only imply the standard results of higher prices (interest rates), lower output, and lower social welfare, but it affects the effectiveness of monetary policy as well as the stability of the financial sector as a whole. Furthermore, as we explained here, it may affect the strategic behavior of borrowers, yielding additional effects on output, growth, prices, and social welfare among other things. Therefore, further research on this issue is needed.

Banks in Europe, as well as the environment in which they operate, are continuously changing. The deregulation, internationalization, and globalization trends triggered by the path towards EMU and the Euro will not stop here. Disintermediation and the development of information technology will continue to affect banks' operations. Banks go on introducing new product lines for risk diversification purposes; new players (such as insurance companies and non-financial firms) keep entering the traditional banking markets; and incumbents continue to merge or engage in joint networks (e.g. the common automated clearing house Interpay in The Netherlands) in order to improve their strategic positions. This illustrates that the institutional setting as well as the competitive environment of banks, and therefore their behavior, is subject to continuous change. Thus, the issues touched upon in this thesis in particular, and in the IO approach to banking in general, will be ongoing topics of research and discussion.

