

## A THEORY OF THE BANKING FIRM

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### Abstract

The theory of the banking firm proposed in this paper is essentially a version of the "New Theories of the Firm" based on product differentiation rather than price discrimination. The firm is assumed to exist because it has a cost-reducing role in the phases of the productive process which concern consumers' goods, just as the bank has a clear role in the allocation of productive resources. However, I shall maintain that the special role of the bank is successful only in a particular structure of financial markets. Transaction costs and uncertainty are shown to motivate the existence of the banking firm. The indispensable function of the bank is to supply to depositors non-neutrality of wallpaper, i.e. to supply liquidity. The decisions of bank depositors are analyzed and the cash-in-advance constraint is derived. Some bank behavior, such as the desire for deposits, the desire for collaboration with the State and the determination of financial and policy equality, are also studied. Formal demonstration is carried out of the Keynesian theory that the propensity to create liquidity can be either too high or too low in terms of the performance of the economy.

**Keywords:** Theory, Banking Firm, Financial, commercial.

### Background and Motivation

This chapter presents a new model of bank behavior. The objective is to understand the role and function of banks in the economy. This question has two related parts. On the first part, it is the claim of this chapter that banks exist to perform two distinct functions: the lending function and the creation of deposits. The lending function of a bank has not received a great deal of attention from theorists over the last fifteen years. Yet it is a function which is essentially peculiar to banks. It is other intermediaries that specialize in the lending function. To date, only the 'information-based models' developed by Allen and Gale, which formalize theories of relationship lending, or the 'monitoring models' of Douglas Diamond, capture this crucial feature of banking properly. We expect them to play an important role in future debates on bank behavior. The existence of deposit creation has, on the other hand, received a great deal of attention. When the

models that presume its nonexistence are dropped from the discussion paper, the soundness of the training makes the control sample even more implausible than as was reported. The objective of this chapter is to show that heterogeneous views on a much wider range of banking issues can coexist in a model where banks possess a virtually completely arbitrary menu of risks and self-select on this basis endogenously, both with and without banks.

The second part concerns the fate of the bank. To be sure, individual banks and even national banking systems fail occasionally, often with far-reaching consequences. Indeed, it forms a substantial part of the training bank historians and, of late, of a few banking economists, whose models contain bank runs and/or other forces of supreme collapse. Statements of Moderately Brave Survival mainly consist of the claim that the number of catastrophic failures is relatively small. The More Brave Heretics go

further and assert that when the occasional small crisis does occur, the entire system is not able to avoid it by means of immediately accessible interventions such as lender-of-last-resort facilities, deposit insurance schemes and the like. There is no country that does not have some combination of the two. What is more, the study presented above even suggests an explanation of this pattern of belief. It arises from a conjunction of the variety in the structure of the banking systems in the various countries of the world and in the education or self-education of bank historians and bank economists within these countries. These varying structures differ in almost every detail, both on a microeconomic and a macroeconomic level, not just to some extent, but each in every respect. These differences include: The development of the supply of basic banking functions over time, from at most a few large banks in 19th century Britain to a great many small banks in 20th century Germany.

### Research Objectives

The research objective is to achieve an optimum position in the credit market by developing a new theory of the banking firm. The explicit objective is to compare this theory with alternative theories in an effort to explain how and why commercial banks operate like commercial banks. While some candidates for an alternative theory of the banking firm will be discussed, it is not central to the development of the Credit-Granting Perspective. The primary emphasis of the monograph is on identifying the economic necessary and sufficient conditions for the existence of a specialized credit market component. Most contemporary theories of the banking firm employed by both financial persons and economists emphasize the commercial bank's position or specialization in the money-creation process, payments mechanism, and maturity-mismatch.

Commercial bank deposits are money, whether the deposits consist of conventional demand deposits, which are checkable deposits, or unconventional forms of demand deposits,

such as negotiable orders of withdrawal (NOW) deposits, or they have a time element, like time deposits of less than 18 months. These types of deposits are moneys of both the official and conventional definitions. The forms of commercial banks' lending activities place the commercial banks in the money-creating-shorthen area of the money creation process and effectively insulate Federal Reserve from making mistakes in Federal Open Market Committee (FOMC) policy, which could be interpreted publicly and political import actual behavior or intentions suggest that the money stock has expanded prior to the effectiveness of FOMC policy, and ending macroeconomic policy adjustment in the private capital market, which would otherwise be necessary to correct the mistake made by the Federal Reserve policymakers.

### Methodology

This might be criticized as a much too optimistic evaluation of a theory in which the models are carefully specified and solved. Yet in many ways, this is what is involved. The strength of models lies in that they often provide us with useful ways of viewing things, useful metaphors. Thus, the theorem that an increase in nominal balances supplied by banks, other things equal, leads to a proportional increase in prices could have been 'proved' without ever specifying a model. The belief in such a theorem need not be diminished by the fact that, upon the specification and solution of a model, one finds it does not apply to the real world and can usually be shown to be due to ridiculous assumptions.

However, I do not wish to present the models that are going to be discussed as merely providing us with means by which we can prove useful, though untested, propositions. Models can be constructed within a framework that embodies a philosophy of the banking firm. There are two philosophies of firms which have been popular in the literature, but neither is appropriate, both are elements of the truth. Firms are bureaucracy, firms are entrepreneurs:

every encyclopedia of economics will contain a discussion of the problems of the ad hoc hypothesis associated with using one model instead of the other. However, the remark can be made that there is more to the debate than 'which model to choose?'

## 2. Theoretical Foundations

"A Theory of the Banking Firm" makes the case for a discipline of banking firm economics. Postulating that relationships on both sides of the balance sheet are integral to banking, it contends that "banking firm economics" should be considered alongside microeconomics and institutional economics. Validation comes through historical and international illustrations that are unexplained by contemporary microeconomics. It points towards further reintegration of the financial economy and real sectors of microeconomics.

The discipline is manifest in a five-level hierarchy of financial intermediation: momentum, hypothesis, reinforcement, transmission, fundamental. These levels reflect the progressive contribution of relativity to shortsightedness, deregulated monopolistic competition, evolutionary modelling, institutional hypotheses, and finally relativity of stability, legal and policy intervention, as well as a facility to supply rather than just transform liquidity. The paper concludes with concerns on the support presently accorded to microeconomics.

### 2.1. Financial Intermediation Theory

Deduction of a theory of the banking firm. Originally, in the Old Institutional Economics (OIE), banks are credit creators, so should be treated in an original way. Their machinery to this end was their "inside money", issued in the form of loans expressed in money terms. Consequently, banks are financial intermediaries and cannot be placed in the same analytical category as firms that produce goods or render services. This paper examines the grounds on which the simplest financial intermediation model has made banks the

favorite children of institutionalists and the history of an old battle: the battle against the theory of the banking firm that culminated in the teachings of Modigliani and Miller. Then some conclusions are derived: the simplest financial intermediation model are greatly affected by external capital restrictions, which is going to affect the responses to tuition regulation, securitization and crises. Banks thus remain the story of the dog that didn't bark in financial economics.

The first to develop a theory of banking based upon the Old Cameralism perspective were Knapp (1905), and Schumpeter (1912). In "The State Theory of Money", Knapp founded the Law of Reflux, stating that credit money can only be created on the basis of the creation of goods first. Special rules and control were sound arguments to restrict the issuance of fiduciary media to the government. Both Schumpeter and Knapp considered credit's nature as a means of payment and the channel that bank money gives to circulation. Such institutional grounds for the behavior of banks, especially around macroeconomic issues, have been well developed by Knapp (1924) and perhaps provided in further detail and defended by Smithin (1993). Banks are unique in that for any given financial structure, banks enjoy being able to grant new loans, thus creating money.

### 2.2. Principal-Agent Theory

The standard model of contracting between shareholders (principal) and the manager (the agent) emphasizes the information advantage of the latter. This is in contrast to Stulz (1988) where the manager is better informed about fine deviations between the interest of the firm and the respective interests of the shareholders, the creditors, the superior firm (the parent), and the can intensive inputs being specific and therefore having no alternative use. Realization of the potential conflict arises only if the firm is incapable of making specific investments in human capital in the pursuit of the objectives of these residual (including the creditors in his residual interest model).

## 1 Theory

If the banking firm, as a form of bodying is efficient at internalizing the conflicting interests of various groups in the pursuit of the objective function of the firm, then there would appear to be a crucial difference between firms: those capable of providing these "corporate benefits" to the group of participants – be it through superior management, superior financial strength, the internalization of monitoring costs or any other form of capitalism, the weakness of the Anglo-Saxon bank-based systems, where the participants have to rely on the risk associated with corporate control market.

### 2.3. Transaction Cost Economics

Laffont, Rochet, and Tirole model the process by which a) a promise of future financial services from the banker, K, to an agent, M, becomes credible, and b) the customer, M, turns over control of sufficient resources (considered as finance, investment, and employment) to the banker, K, to guarantee compliance with the contract between K and M: investments required by the agent's contract distributed over the time period of the contract. They consider explicitly the effects of proprietary technologies in the custody and assurance problems.

The property rights problem between K and M is that K invests in assurance, K is gone, and M is left with the consequences of the investment. Not only do these considerations matter for the division of investment between K and M in the previous section of the theory, such custody and assurance considerations provide another explanation for the reduction of transaction costs by custody – contributing both to reduced cost of providing services of one given type and to K's vertical integration of further links in the contracts that would be necessary if the obligations were done by different agents.

### 3. Banking Firm Objectives

What are the objectives of the banking firm? Why are these objectives peculiar to banks? In the standard theory of monopoly industries, the

monopolist earns its position by reducing output and driving up price. Are banks competing by increasing joint profits at the expense of consumers? Or could it be that the banking firm is unique, neither in terms of monopoly or competition, possessing goals both of which are unrealistic as guides to industrial regulation? The main distinction between banking from ordinary business, savings from consumption, has no relevance at all in defining the banking from other service industries, is efficient in financing harmoniously expanding industries with available cash. This is quite irrelevant in an overall measure of the "social" desirability of these industries which have compatible disposititis or even our wants.

With this in mind, let us first ask if banking – the keeping safe and transferring of money, credit expansion, etc. – occur in connection with saving from consumption, could it be these are carried out by unique organizations, serving special clientele interests? The answer here is clearly no. A marketing firm offers a composite product worth the discounted value of the quantities of output sold. In the case of advertisement under uncertainty, the consumer acquires survival insurance at a competitive rate for delivery through product services, or later, he can rely on security deposit arrangement against loss of the service at some proper time. Trustees, rent collectors, etc., can be expected to come from many sources. There is really nothing much a specialized banking institution can do so uniquely or purely.

### 3.1. Profit Maximization vs. Stakeholder Theory

Many people attribute the absence of a specific, all-encompassing stakeholder theory of the firm to the claim of some normative paradigm of the profit-maximizing firm. For example, "If we still have, then, the traditional objective of the firm, that of profit maximization, what makes modern US firms appear to demonstrate so much more social interest in their behavior?" While it may be true that neoclassical economics assumes that firms are profit maximizers, such an assumption cannot

account for corporations exhibiting a concern for employees, the environment, and the like. Often, the so-called 'behavioral' assumptions are used to explain away this tension. I believe that this is wrong. The behavior of corporations - the entries into social contracts, the provision of safe products, the investment in training and worker skills as well as in social unrest as the price of conflict - all make sense in a well-developed framework of profit-maximizing behavior.

The simplest statement of the tension between maintaining significant social encounters between the firm and its customers, employees, and other interested parties is what Jensen and Meckling call the stakeholders problem. In this model, individuals involved in the firm's contracting processes are infected by hometownitis. That is, these contracting individuals have fostered incomplete markets because they are unable to enter into Pareto preferred contracts with other relevant people. We want managers to invest in firm-specific skills, to specialize in function, and to facilitate an efficient communications network that gets information from production departments to the top - to take on the firm as their own. The actual bodies that assume the roles do not capture all the gains from enterprise control and get bad at producing goods efficiently - getting lazy, shirking, or otherwise behaving in a manner that misdirects resources and decreases the value of what the corporation produces.

### 3.2. Risk Management and Capital Adequacy

While the conventional view is that bank capital ensures the security of deposits, this argument does not make sense, and any collateral or guarantees deposited by risky firms are much more reliable. Instead, we argue that the real function of capital is to act as insurance for depositors who may need to make withdrawals at times when banks have only low yielding assets. If all banks invest all funds in long-term instruments such as discount paper, there is no need for capital, and the bank is already 100

percent funded. However, if it invests in any short-term claims such as deposits, it needs to be able to cope with deposit outflows, which are hard to forecast. The fundamental dilemma is therefore the choice between liquid but low-yield assets and illiquid but high-yield assets, with an associated risk of liquidity crisis.

This poses the potential threat to the efficient functioning of financial intermediation through banks, since the risk of a financial crisis may require that a bank reassume its banking privileges in an emergency even when it operates as a normal firm, a risk that cannot be borne but which will require the government to act as an implicit back-up guarantor. In such a situation, the firm will use its favorable position to bid for funds which do not reflect fully the market risk of its borrowing.

### 4. Banking Firm Activities

One of the first things that a student of any business enterprise wants to explore is its substantive and operative operational content. The learning process, at least an important part of it, involves learning about what a firm does. Business schools, as professional schools, expect their students to be concerned with substantive issues in the theory courses as well as the functional ones. There seem to me to be two sorts of good reasons for expecting to learn about the substantive activities of a business in the process of mastering a subject about which such learning later can be expected to be useful and valuable.

First, the chief benefit which a business degree confers upon its recipient is the ability to do things in the business world. It is not merely an exercise in words. We expect set theory in a mathematics degree and footnoting in a law degree, but business is not a liberal art. I do not out of any of these in apparent elitism, merely an emphasis upon utility and actuality. The normative content raises the second good reason for concentrating upon the substantive activities of business. It is because the theory of the firm seems first and foremost to be about the optimal way of choosing functions for the

firm to perform. This is both descriptive and normative. Business is mandatory; what is done in business is an entirely different matter.

#### 4.1. Deposit-Taking and Lending

The activities of financial intermediaries – especially where the commercial banking system is based – are generally described as taking deposits and making loans. These activities are certainly crucial to the functioning of the banking sector, but is a banking firm necessarily defined as an institution that provides both of these services? Some of the largest and most successful banks are single-market institutions concentrating entirely on one of these two functions. Other institutions, certainly, provide both of these services, but are hardly banks at all – individual savers – including you and me – who lend to individual borrowers. An answer to this question comes, in part, from what makes banks special – what functions do banking institutions and, as we shall be discussing in the next section, other financial firms perform or, to put it in terms that reveal our focus, what is it that interposes a bank or banks in between the preferences and the circumstances of the individual savers and borrowing and applying the funds of the final end-users.

In this environment, with potentially money-creating banks, the pay-for-intermediation – the spread – will be much smaller than in the absence of money-creation. This is especially true along the flat portion of the demand for money; there, changes in intermediation do not have a sizable effect on the level of economic activity. This is the combination of risk, maturity transformation, and expense that almost certainly must be involved in the explanation of what it is that banks and other financial institutions do. Money-creating or not, it is, after all, not obvious what it is that banks or other financial institutions actually do with the funds deposited with them.

#### 4.2. Fee-Based Services

We have thus far confined our attention to the initial allocation by the bank of investable funds, and we have neglected many areas of banking beyond the interest of the investor in the initial procurement of shares in the bank. Apart from accepting funds from different sources and investing in different assets, there are scores of fee-based services that result from the existence of banks. These range from basic services like accepting and executing orders for the purchase or sale of equity shares, bonds, or other assets, to more complex services like the establishment of commercial letters of credit and foreign exchange trading. Each bank will differ in its dedication to the provision of various services, and there is a wide possibility for differentiation by banks in both the volume and quality of services that they offer. The reason for this lies in the fact that operating profits from the provision of fee-based services are also subject to diminishing incremental costs, although the cost functions and requirements are different.

#### 4.3. Capital Markets Activities

John Mercer reports some evidence from Canada on the question of how competitive banks would reach the "optimal allocation" of capital. Mercer compared the allocations of a group of large "financial institutions" with a group of large "industrial corporations." He observed that the former "could not, in fact, be characterized as an equity-dominated" group. Mercer found evidence that banks used a system of nationalized insurance and a system of government guarantees to obtain a preferred allocation position for insured deposits and that in order to maintain that position, vault cash had to be used to acquire capital stock. Vault cash usage rose as capital grew indicating that additional credit could not be given in the private markets where the banks competed with other equity investors. Dividend payments on capital stock could not be financed out of operating cash flows. Rather, banks used the corporate and tax opportunities provided by

legal accounting rules and the ability to formally declare dividends of up to 80% of the purchase level of non-cumulative, non-dividend participating, preferred capital stock, and used the full range of parent-subsidiary relationships allowed by the existing bank regulations in order to avoid formally declaring retained earnings.

The "competitiveness" of the supplying capital, which the first two papers in this section claim to be no problem, was dealt with by: (i) the undue competition of prior holders of guaranteed liabilities with other suppliers of loss-absorbing capital to the bank being classed as "undue access" creating a moral hazard; (ii) supply reductions were to be considered to be the result of the activities of regulatory and examination pressures to ensure that proceeds from the sale of these equity forms never "leak out of the institution;" (iii) capital assessors, like credit departments, were, if they did their job properly, insoluble.

## 5. Regulation and Supervision

Given disputes in the literature over the existence and desirability of capital requirements on non-deposit financial institutions, and their importance for distinguishing bank from non-bank financial institutions, it is worth stressing that the role of capital requirements in our analysis is to provide the regulator with a "stick" to enforce the institution's commitment to depositors. In the absence of capital requirements, one could conceivably rely on the fact that equity can be used to absorb losses which, combined with the threat of costly dilution, would lead owners to run their institution so as to virtually avoid insolvency. Short of external fraud, surely no self-interested management would run down its capital until it approached zero. Of course, if bank assets have appreciable risk, then once the institution's capital is sufficiently eroded, incentives for managerial exploitation might well overtake the conflict-of-interest problem. However, these incentives could be mitigated somewhat by requiring high returns to equity

(thereby effectively increasing the capital requirement) for extremely thin-capital institutions.

One might thus wonder whether the sizable capital requirements imposed in actual practice have much point, particularly in an environment where creditors and shareholders of banks are aware of and respond to risks facing the institution in a manner that could be expected of non-bank financial institutions which may be virtually run by agents or which may have dispersed ownership. The thesis developed in this paper is that this is indeed the case. In an economy where agents have superior information, impartial deposit insurance, combined with the inability of the market to adequately monitor both the composition and risk of bank assets, may lead to an inefficiently large banking system. Since equity can absorb only small shocks, the institution may be tempted to incur particularly risky investments even relative to non-bank rivals, in a manner reminiscent of demand deposit/payment float bondholders. While moral hazard issues arise with non-bank financial institutions as well, the explicit subsidy offered by deposit insurance can be significant, grossly differentiating the banking and non-banking industries.

### 5.1. Role of Central Banks

Many authors have developed motives for building and conserving reserves in the banking system. These reserves may be included in the analysis presented above as they help banks manage their liquidity. They form a floor for some operations that banks may want to develop with the non-bank public. They facilitate clearing among banks and through the central bank. These motives have a corollary - an institution that is able to manage reserves and provide the reserves needed by the system tends to be built. That is, there is a tendency to build and expand central banks. As we show in the next section, this last point does not hold in all countries.

It may be that the evolution of central banks came after the development of the banking system, as a response to the inability of the banking system to clear its rules. Initial reserves might, in this sense, come from the national government. It also might be that private institutions started to play some roles that are now performed by current central banks. In a certain sense, a central bank can be viewed as a "pooling" of those reserves. At a larger scale, also for the system as a whole, a depositor can view their deposit at the banking system as a liquid form of reserves. No further liquidity is required. Only the benefits of the payments system are required.

### 5.2. Prudential Regulation

Prudential regulation aims to protect deposit insurance funds from losses, to protect other creditors from bank losses, and to protect the overall economy from the consequences of bank insolvency. The common features of prudential regulation include capital adequacy requirements, minimum liquidity requirements, legal restrictions or prohibitions on the composition of a bank's investment portfolio, caps on lending rates, minimum capital requirements, and notice and licensing requirements. The objective of prudential regulation is typically realized in terms of minimum thresholds. Although all banks may make money, at least some of the time in a short-term sense, regardless of size or level of capitalization, all banks are exposed to a penalty for insolvency. It is this possibility of insolvency reflected in the deposit and other interest rates that prudential regulation aims to influence.

The purpose of capital adequacy requirements is to align the costs and benefits of bank behavior with those of society. The cost of prudential regulation is the distortion imposed by the efforts of banks to maintain regulatory compliance,

### 5.3. Market Discipline

One of the most important results is the possibility of a form of market discipline that can help detect and prevent widespread insolvency in the banking industry. The idea underlying market discipline is simple. There are no market signals that can perfectly measure the fundamental solvency of a large banking conglomerate such as Citibank, Chase Manhattan, or J.P. Morgan. In the circumstance of small banks and bank holding companies, however, we can use market prices to help monitor the effectiveness of different strategies and the behavior of the banking industry. When people believe that bank assets are fundamentally worthless relative to a large fraction of bank liabilities, then they will sell off the bank's assets or equity.

When depositors worry and try to withdraw funds and the bank does not face temporary liquidity problems or 'runs', the bank or investment bank will sell assets. Protecting uninsured depositors will help preserve value for subordinated debt and other bank 'liabilities'; external values other than CDO, credit card, and other assets 'risk avoided' can be preserved during the uneasy or crisis decade of economic unrest or discomfort. None of this is guaranteed in the framework. Movements in the asset side of the world's banks and investment banks do not occur without consequences. The observable behavior of banks and bank holding companies will react strongly to actual or potential market signals.

### 6. Banking Firm Performance

On the one hand, upright self-interested behavior of profit-maximizing bankers and the repeated pattern of business ties fostered by relation-specific transactions make the banking firm a more efficient main financing technology than its main rivals, the formal capital market and the financial contract market, for previous and new projects of the firm customer. On the other hand, the incumbent capital scarcity rent causes banks to only partially internalize the effect of their credit allocation decisions on a



firm customer's level of investment in new projects. When a deposit banking firm's capital is costly, it will take less risk than other, non-bank rivals in lending for new projects. In both examples, bank-specific performance differences are caused by the integration of an inside and outside output.

The release of the immediate short-run constancy of main balance sheet relative prices imposes a medium-run discipline on aggregate balanced banking firm customer claims, which is guided by a risk-averting financial management with ex ante some financial capital.

### 6.1. Measuring Financial Performance

It is useful to measure financial performance to see how well a firm has done at pursuing its goals. Also, financial performance measures are often used to evaluate how well managers do their jobs. Profit is often used as a measure of how well a firm has done at pursuing its goals.

An alternative to profit as a measure of how well a financial intermediation firm has done is to measure how effectively it creates external network benefits of money pooling, payment system, and information production. For this alternative to profit to be useful, it is necessary for there to be some sort of "double entry ledger" showing what financial claims are created and what resources are put up as collateral.

Many different profit accounting measures can be constructed. One of the oldest is the income statement that shows gross profit as the difference between sales and the cost of goods sold, and net profit as the difference between gross profit and other costs. Another is the balance sheet that shows the difference between the book value of assets and external claims. The simplest and most often used measure of accounting profit is the flow of funds to stockholders through remittances and dividends. Banking firms often do not distribute much of their "profits" to stockholders – typically

less than 20 percent of company earnings is remitted as dividends.

### 7. Technological Innovation in Banking

That technological change generates investment opportunities is a familiar idea in the literature on growth and development. The banking firm's knowledge-driven, information-based technology can be organized so that innovative capacity is replaceable when new opportunities appear, and technological progress transforms the economy both by creating new possibilities for investment and by altering existing investment opportunities. Banking is then an industry possibly free from diminishing returns at a time when this problem is attracting most attention. A banking system not restricted by geographical or national borders is also a possibility. Thus, the idea of diminishing returns is challenged by proposing that the requisite economies of scale, economies of diversification, and availability of bank loans at a reasonable margin can be established more easily than is generally supposed.

The remarkable fact is not the apparently vast heterogeneity of demands met by banking firms, but rather that almost all of the advances in the use of inherited knowledge involve banking organization. Competition, concentrating market power, and growth are the rule even though a great mixture of safety and soundness regulation all affect banks in most of the more advanced countries. Distinctions within the banking industry as traditionally defined have proved to be small as law-breaking ventures have been developed. The resulting degree of commonality among the overall operations of different central banks contrasts sharply with the level of employment, the mix of international and domestic operations, and the concomitant proportion of profits that are treated as governmental earnings realized by the central banks and by the branches of the government's own bank (if one exists) in different countries.

## 7.1. Digital Banking

The rising uppermost layer consists of institutionally and technologically dynamic banks and insurers who have offered network services to the general public and businesses, have innovatively attenuated private and public risks, and have developed increasingly complex corporate and personal finance services. In adjusting five paradigms to digital banking, the chapter notices that an unavoidable banking firm's characteristic – the need to diversify risk and costs alongside the tens of investment projects – continues to apply. Both securitisation and digital banking illustrate the power of banking business over average business. Their pristine nature of informational symmetry and long history stress the conservative banking activities in the risk-adjustment functions which all traditional banks and insurance houses share, and they motivate the Lelio and Scarpetta hypothesis that the monopolistically competitive banking sector adjusts wages and relative employment in a dissimilar manner than competitive firms do. At weir and amazing new firm level, digital banking provides some evidence for the Rogers and Tiebout conjectures.

Suppose Apple or Google are allowed to offer all services of a technologically aggressive fully modelling and insuring, maximum informational symmetry bank. Might they fall prey to the parable of the golf course: that it is nice to have a golf course, but that it is nicer to own your own personal golf course? They might give away for promotion their very costly individual market investments, or sell their services at prices which do not include all network gains associated with their quantum increase in the services' convenience level. Would they want to enter the financial services sector in the first place? Considering succinctly the resulting welfare issues, this experimental reflection only highlights an exciting change in banking firm theory which speedy evolution towards digital banking has made necessary.

## 7.2. Blockchain and Distributed Ledger Technology

The reduction in the value of assets, if they are not able to be used confidentially, is not easily calculated as it is mainly a function of individuals' ability to have privacy. Nevertheless, it is likely that the degree of "money-ness" of tokenized assets would disappear. This value would represent a premium that the assets would be expected to have in the hypothetical world in which they were not tokenized. Probably, in that world, there would be holders of tokens and holders of the asset. The costs of buying the asset and tokenizing it would be very high, and ownership would be much more strenuously regulated. And yes, this suggests that the inevitable consequence of tokenization is the destruction of the concept of "money". In the final count, this will mean that to establish and grow their businesses, token-based financial intermediaries would need to borrow traditional money, or they would need to convince economic agents with transaction motives that it was convenient to borrow tokenized assets, possibly increasing the implicit costs of tokenization, including both transaction costs and the costs of owning assets that are less "money-like".

A further institutional challenge of a DLT-based banking system arises from the limited ability of the technology to pool resources unsynchronized in time. A bank can pool resources from depositors who are willing to allocate funds for different amounts of time, bearing the cost of managing the synchronization of assets and liabilities. The DLT is a real-time technology, and this type of resource sharing has the critical form of a "pooling service". A pooling service for resources is the main issue related to the maturity transformation function of a bank. The intention of maturity transformation is not to transform the average maturity of a bank balance sheet, but to allow depositors, who have average maturities longer than the duration of a single asset, to have access to funds when the need arises. DLT-based digital banks cannot offer this

service. A customer can tokenize a set of assets and store them in a DLT and obtain tokens, which depending on the regulatory framework, can be denominated as deposits and can be used to make payments at any time. However, the direct loan can still be whenever beck and call. The other investors (the equal shareholders in a mutual fund) will want to be compensated for such flexibility, but the technology itself, the DLT, makes the pool of aggregated resources at reach of their owners on demand.

### 8. International Banking

Until the outbreak of hostilities in 1914, holding foreign securities was the principal way in which British banks could employ their equity. British banks held foreign loans because these loans were sold. German banks, in contrast, did not hold foreign loans because they lacked correspondent banking relationships in countries like Russia and Belgium. After an outbreak of hostilities between Britain and a foreign country, as is currently, of course, the case with all Soviet-Bloc nationalized foreign trade, financial favors from banks are now the indispensable permissions for exports of all goods under conditions of private-enterprise capitalism.

These permissions are initially extended, of course, by the principal ruling councillors of government. They continue to be extended only so long as those councillors feel that they are in control of the activities of banks, impossible to do if banks have globe-spanning operations. This need for control is why many governments are now endeavoring to create centrally-controlled national departments of international trade through which they can channel all national exports and imports. Such a move allows them to eliminate all bank operations abroad, as those operations are no longer necessary for the exercise of governmental control.

#### 8.1. Globalization of Banking

In the past two decades, advances in information and communication technologies

have enabled banks to reach a global market easily. Giant banks, which operate in many centers worldwide, have become increasingly common. These banks differ significantly from the majority of domestic institutions, and they present both policy concerns and, in my view, serious theoretical challenges.

Because it is so easy for huge banking conglomerates to spring up, a natural question is why there are not vastly many more than the several hundred such banks now existing. In a recent paper, Robert Marquez and I argue that the internal organization of universal banks is key to understanding this puzzle. Indeed, the question of how banks should or do organize themselves internally is fundamental for the understanding of banking as a whole, and the ongoing evolution of the banking firm.

#### 8.2. Cross-Border Banking Operations

The empirical evidence shows that central government surveillance and regulation results in a geographic distribution of bank branches dominated by the regions with the highest initial population and economic activity. This means that participation in banking services is more restricted for less developed regions. This is one of the main reasons for the lack of uniform economic development rate on a national basis.

Centralization of banking services provided in the country, at the time of liberalizing regional freedom to open branches, resulted in an intensified concentration of the most profitable banking services in a few banking centers belonging to the big service providers. The goal of "a banking service for everybody" is not met. On the contrary, it is monopolized by big banks through regulating barriers limiting service entry.

The home-mobile variety in banking services in the country does not shift a high number of people from remote districts to banking centers for the purpose of directly using services, but forces them to rely on local agents, especially in retailing. Uniform regional distribution of bank

branches is an unprofitable pattern which reduces profit on bank service activities because the acquisition of a national uniform service network is a measure of maximizing average rather than marginal profit.

By allocating assets efficiently to regions where the return is highest, the bank has two benefits: it uses the deposits in the entire country while generating a higher yield compared to that obtained by holding government securities. The role played by local/domestic branches is addressed in terms of obtaining and assimilating fully reliable information on the loan applicant and on loan profitability through the exploitation of collateral in case of bankruptcy.

North-South conflicts within big banks should arise as a consequence of Austria's specific regional distribution. The big bank benefits from foreign branch activities and speaks for banks' freedom on a national or international basis.

### 9. Environmental and Social Responsibility in Banking

This chapter contributes to the debate on socially responsible investing (SRI) and social/environmental (SE) credit rationing in banking. Its principal contribution is to show that more social/environmental responsibility by a bank generates potential positive and negative impacts, and that the net impact in general is not clear a priori. For this purpose, we present a general framework for the analysis of strategic behavior by a banking firm in an analysis of environmental lending, which extends the traditional analysis of banking to encompass the social and environmental impacts when lending to private borrowers.

By making a distinction between a private or commercial firm, a banking firm, a state-controlled bank, and a fully state-owned bank, and between bank objectives, borrower behavior, and decision mechanisms, this chapter develops a dynamic model of environmental lending in a transition economy with three objectives. First, in addition to bank

shareholders, the lending decision model introduced in this paper includes the state as a holder of the social objective, and the concept of environmental lending of a banking firm as a non-traditional commercial lending activity with potentially different influences compared to traditional banking objectives. Second, borrowers are classified into commercial borrowers and environmental borrowers; however, bank lending services are not linked to some form of bank management other than the social objective of the state. Third, by introducing and deriving social costs and establishing a high enough lending volume, it is shown that the softening of the budget constraint in a bank's financial activities comes at a cost and is more penalty than using private equity financing.

### 10. Challenges and Opportunities for Banking Firms

The banking firm must expect increasing scrutiny and regulation. We argue for an evolving capital and control regime that uses market mechanisms to manage moral hazard and mimics the involuntary isolation of owned capital within the bank. Finally, the potential growth of the capital market for banking would liberate choices among business forms and offer prospects for efficient evolution of the industry. The depository and central banking architecture of our economy is, or should be, designed to provide liquidity to the supermarket of finance in times of market breakdown. The problems of insolvency at depository institutions do not raise systemic risk.

In addition to its monetary function, central banking also serves emissary functions that help provide redundant funds and foster lender-of-last-resort services through the economy. Furthermore, risk-bearing by depository-type intermediaries – trading off disintermediation losses and services such as liquidity provision in times of market stress – is a positive contribution of these firms. Nevertheless, the need for oversight and regulation of depository institutions is enhanced

by two factors. As institutions that hold insured liabilities and make use of central bank clearance facilities, depository institutions depend heavily on the good offices of the taxpayers. First, because of the need to avoid losses to taxpayers, there is an incentive to create a permissive environment in which depository agents can grow too big to be resolved without unacceptable costs or losses were problems to arise.

## II. Conclusion and Future Directions

We have argued that it is possible to model a banking firm as a firm that provides distinct services with very few problems coming from scale or scope associated with the joint production of these services, and very few problems with delegated monitoring or manipulation. We showed that a simple model is capable of replicating much of the empirical diversity that is observed across different types of banks.

The results are notable both in the context of corporate finance, where the lemons problem associated with the issuing of equity was used to explain the prevalence of banks, or the use by banks of rather high levels of reserves or equity, and in contract theory, where the tendency of regulated financial intermediaries, such as banks or insurance companies, to use excessive leverage, has been the biggest application of agency theory. We have shown that the empirical facts explained by theory related to capital and its costs, risk management, the provision of distinct services either alone or jointly, and widely the simultaneous use of different sources of funds. Looking to the future, we need to acknowledge that although our model does a lot of things right, the lack of an agent in need of monitoring might render its abilities seriously limited.

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