Institutional Economics of Central Banks

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Introduction

"During the last few years of my stay in the Bank, however, it seemed to me that the focus of interest among academic monetary economists was shifting away from concern about appropriate rules of conduct for Central Banks toward even more fundamental issues about the rationale for having such an institution in the first place" (Goodhart, 1988, p. vii).

As Goodhart says, there is indeed growing interest in the institutional aspects of central banks. While neither a government agency nor a commercial bank, a central bank nevertheless holds an important position in a country's economy and its banking system. In addition, financial globalization and the progress of information networks have changed many institutional aspects of a central bank.

This paper will examine why central banks exist within the banking system, and then study the institutional issues currently facing central banks, for example: 1) the evolution of central bank cooperation and supranational central banks, 2) bankers' associations vs. central banks in providing payment services, 3) the supervisory role of central banks, and 4) the clients and business scope of a central bank.

In studying these issues, we will apply the theories of New Institutional Economics, particularly Transaction Cost Economics (TCE). TCE began to spread in the 1970s, primarily thanks to the contribution of Oliver Williamson. In 1991, one of the founders of TCE, Ronald Coase, won a Nobel prize for his work; then in 1993, Douglas North won a Nobel prize for his application of TCE to economic history. TCE is, therefore, a recognized and powerful force within the discipline. In contrast with Old Institutional Economics, New Institutional Economics, represented by TCE, supports the basic attitude of respecting the traditional tools of microeconomics whenever possible. Based on recent developments in microeconomics, which includes information economics and organization theory, TCE can provide a much better understanding of many interesting institutional issues.

Although TCE is not hostile to orthodox economics, it operates at a more micro-analytic level than is customary in economics. "The transaction is the basic unit of analysis, whereas orthodoxy is concerned with composite
goods and services” (Williamson, 1996, p. 6). “Discrete structural rather than marginal modes of analysis are therefore employed. First-order economizing (getting the basic alignments right) rather than second-order refinements (adjusting the margins) is therefore featured” (p. 7).

In Section 1 of this paper, we will apply Williamson's three categories of economic system — i) market mode, ii) hierarchy mode, and iii) hybrid mode — to identify three banking systems — i) commercial banks only with no central bank, ii) central bank only, and iii) both central bank and commercial banks. In Section 2, we will analyze transaction costs in these three banking systems and explicate why it is the two-tiered system with both central banks and commercial banks that has survived. From this analysis we go on in Section 3 to consider the implications for the institutional issues that central banks currently face.

1. Why do central banks exist?

We will classify banking systems seen in world history into three types, no central bank, central bank only, and both central bank and commercial banks. Then, we will analyze the relationships of the three types of banking systems with the three concepts of economic systems in TCE. The relationships show why central banks exist in the banking system.

1.1 Three types of banking systems

History shows that the banking system found in the modern market economy is not the only kind possible. This is especially true if we focus on central banks; there have been times when no central bank existed. There have also been times, as under socialist economies, when only central banks comprised the banking system. Thus, historically, there have been three types of possible banking systems, one of which is the current two-tiered system in which commercial banks and central banks co-exist.

Type A: No central bank, commercial banks only (Figure 1)

Before central banks came about, only commercial banks existed in the banking system. Historically, similar types of systems evolved in many different countries. This type of system was seen in the United States until 1913 and, in Japan, from the Meiji Restoration in 1868
through to the establishment of the Bank of Japan in 1882. According to White (1984), a similar type of system was found in Scotland from the early eighteenth century through to the mid-nineteenth century. England also had this type of system until the establishment of the Bank of England in 1694.

**Figure 1 Commercial Banks Only**

Type B: Central bank only (Figure 2)

In this system, there are no commercial banks; commercial and central banking functions are integrated. Historically, similar types of banking systems actually existed in socialist economies and were called 'monobank systems.' For example, in the Soviet Union, which collapsed in 1991, there was only one central bank, Gosbank, for all of the federated republics as late as 1988. A similar system existed in China until 1983.
Type C: Both central bank and commercial banks (Figure 3)

This is the system employed by modern market economies, and is also known as the 'two-tiered banking system.' Under this system, the central bank does not, in principle, engage in transactions directly with individuals or non-financial corporations. Instead, it functions as 'the bankers' bank,' and it is this function that distinguishes it from the central bank in Type B.
From a theoretical perspective, this is the consequential categorization since it covers all the basic types of banking systems that could exist, at least in terms of whether or not there is a central bank. It therefore serves as an important starting point in our study, why are there central banks? Of the three possibilities, Type C, the co-existence of the central bank and commercial banks, has survived. Analyzing the reasons why this came about may help us to understand the reasons why central banks exist.

Table 1 gives a summary of the three banking systems and an outline putting them in perspective for considering the banking systems discussed.

<table>
<thead>
<tr>
<th>Participants</th>
<th>Type A (No central bank)</th>
<th>Type B (Central bank only)</th>
<th>Type C (Both)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Only private financial institutions, including commercial banks</td>
<td>Only central bank, no private financial institutions</td>
<td>Both central bank and commercial banks</td>
</tr>
<tr>
<td>Financial markets</td>
<td>Financial markets exist, including interbank market</td>
<td>No financial markets</td>
<td>Financial markets exist</td>
</tr>
<tr>
<td>Financial assets</td>
<td>Cash exists</td>
<td>Cash exists</td>
<td>Cash exists</td>
</tr>
<tr>
<td>Payment systems</td>
<td>Settlements between financial institutions in cash and clearing houses</td>
<td>No need for settlements between financial institutions</td>
<td>Possible to use central bank accounts for settlements between financial institutions</td>
</tr>
</tbody>
</table>

Three types of banking systems and reasons for having a central bank

These three types of banking systems, which have been categorized according to and how central banks exist, provide the following considerations to our analysis for having central banks.

First, we must examine why central banks emerged from banking systems in which only commercial banks existed. Although Goodhart (1988) analyzes this from a historical perspective, there has never been an analysis based on economic theory. This is related to the question first posed by Coase

1 Note, however, that the three types are only a model. While, historically, there have been systems similar to each type, no system has perfectly matched the table.
(1937) as to why firms emerged out of markets.

Second, our analysis will be insufficient if, as Goodhart (1988) raised, we consider only why central banks emerged out of banking systems in which they originally did not exist. As there were banking systems in which only a central bank existed, we also need to explain why such systems did not survive and why the two-tiered system became the norm instead. Once again, this is related to an issue raised by Coase: if firms are superior to market transactions, why does the size of firms not become infinitely large? This question corresponds to why the central bank only system disappeared with the collapse of socialist economies.

1.2 Application of TCE

Recent economic theory, particularly TCE, has proved effective in explaining why central banks exist.

Three types of economic systems

Williamson (1985, 1996) defines the three 'modes' of economic system: market mode, hierarchy mode, which are alternative extremes, and a hybrid mode in the middle.

i) Market mode

The market is the arena in which autonomous parties engage in exchange. In the market mode, transactions are made by spot (short-term) contracts. The parties are in pure competition. Markets can promote high-powered incentives and restrain bureaucratic distortions more effectively than hierarchies.

ii) Hierarchy mode

In the hierarchy mode, transactions are placed under unified ownership (buyer and supplier are the same enterprise) and are subject to administrative control, such as an authority relationship. Authority is a solution to the complex problem of coordination, and it arises out of mutual consent. Auditing/monitoring are important instruments of governance. Hierarchy mode is also referred to as

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2 Modes are also called 'organizations,' 'systems,' or 'institutions.'
'internal organization' or 'vertical integration.'

iii) Hybrid mode

In the hybrid mode, transactions are long-term contractual relations that preserve autonomy but provide added transaction-specific safeguards compared with the market. A franchise network is an example.

The three modes of economic systems classified by Williamson correspond to the aforementioned three types of banking systems:

<table>
<thead>
<tr>
<th>Economic system</th>
<th>Banking system</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Market mode</td>
<td>Type A (no central bank)</td>
</tr>
<tr>
<td>2) Hierarchy mode</td>
<td>Type B (central bank only)</td>
</tr>
<tr>
<td>3) Hybrid mode</td>
<td>Type C (central bank and commercial banks)</td>
</tr>
</tbody>
</table>

The basic reason we can draw these parallels is as follows: while Williamson's classification assumes that components of the system are individual men, our analysis assumes that they are individual banks. Therefore, the mode, system, or organization that we are analyzing is the entire banking system. Individual men in the market or organizations are not the subject here. Organizations such as non-financial corporations or banks are components forming part of the banking system and can be handled as economic agents. Comparison of each type yields the following analogies.

i) Relation between market mode and Type A

When there is no central bank, as in a Type A banking system, there are no vertical relations between commercial banks; transactions take the form of spot transactions in the market. This is the same as the relationship between market participants and the transaction methods they employ in the market mode.

ii) Relation between hierarchy mode and Type B

This mode bears similarities to a Type B banking system in which the central bank and commercial banks are integrated into a single entity like the vertical integration that is seen in a hierarchical
economic system.

iii) Relation between hybrid mode and Type C

Being a combination of the first two modes of economic system, the hybrid mode corresponds to a Type C banking system, which is a mixture of types A and B. When we analyze transactions between a central bank and commercial banks in Section 2, we will see that they possess the nature of being both market transactions and a hierarchical relationship.

Transaction cost and modes of economic system

TCE assumes that the optimum mode will be selected out of the three modes according to each institutional environment existing at the time. The basic factor in making that selection will be the relative efficiency of each mode, which is expressed in terms of transaction costs. In other words, modes evolve based on 'transaction cost-economizing' to offer the greatest efficiency. Modes are also the 'governance structure' that suppresses transaction cost; the transaction cost of a particular governance structure is considered its 'governance cost.'

The basic reason why there are transaction costs is because contracts are incomplete — they might be broken, or costs are incurred to ensure that they are not broken. Williamson (1996) defines transaction cost as "the ex ante costs of drafting, negotiating, and safeguarding a contract and, more especially, the ex post costs of maladaptation and adjustment that arise when contract execution is misaligned as a result of gaps, errors, omissions, and unanticipated disturbances" (p. 379).

The issue of incomplete contracts arises because the following two factors and information asymmetries interlink under uncertainty3. One factor is that economic agents act based on opportunism4; the other is that

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3 Williamson uses the term 'information impactedness' as a broad concept including information asymmetries. However, the term 'information asymmetries' is more commonly used in microeconomics and we have adopted it in this paper.

4 'Opportunism' refers to seeking self-interest with guile, including calculated efforts to mislead, deceive, obfuscate, and otherwise confuse.
economic agents possess 'bounded rationality'⁵. When these factors are present, a contract loses its usefulness being blemished with contractual hazards, and transaction costs can thus no longer be ignored.

The concept of 'asset specificity' is a factor that has a large impact on the size of transaction cost. Williamson defines asset specificity as "a specialized investment that cannot be redepolyed to alternative uses or by alternative users except at a loss of productive value. Asset specificity can take several forms, of which human, site, and dedicated assets are the most common. Specific assets give rise to bilateral dependency⁶, which complicates contractual relations" (1996, p. 377).

Asset specificity and modes of economic system

As noted in the Appendix and Figure 4, Williamson (1996, p. 106-108) analyzes transaction costs as being "expressed as a function of asset specificity and a set of exogenous variables." Below is the relationship between different degrees of asset specificity and economic modes:

i) Low degree of asset specificity

Transaction cost (governance cost) is lowest in market mode and highest in the hierarchy mode. The hybrid mode is in the middle. Therefore, market mode would be chosen to economize transaction cost.

This case also describes the economy assumed in neoclassical economics. There being no bilateral dependency, almost no hazards are involved, even in spot transactions in the market. The high-powered incentives of the markets work efficiently. On the other hand, in hierarchy mode, bureaucratic costs rise and there is little advantage in employing governance instruments, such as auditing and monitoring.

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⁵ 'Bounded rationality' refers to behavior that is intentionally rational but only limitedly so. All complex contracts are unavoidably incomplete because of bounds on rationality.

⁶ The concept of 'bilateral dependency' is defined as: "An ongoing dependency relation obtains between a buyer and a supplier when one or both have made durable specialized investments in support of the other. Although sometimes this condition exists from the outset (familiar bilateral monopoly condition), often it evolves during an ongoing contractual relation. Such dependency poses contractual hazards in the face of incomplete contracting and opportunism, in response to which contractual safeguards are commonly provided" (Williamson, 1996, p. 377).
ii) High degree of asset specificity

This is the reverse of the above. Hierarchy mode is selected from the perspective of transaction cost economization.

This is the case where serious problems occur in market mode. Governance instruments under hierarchy mode must be used to control hazards, or otherwise transaction cost becomes extremely high. Vertical integration has advantages that outweigh the bureaucratic cost. Shifting transactions from the market to an internal organization with hierarchies therefore makes transaction cost economization possible.

iii) Medium degree of asset specificity

This is in between the first two cases, where the hybrid mode is selected.

**Figure 4 Governance Costs as a Function of Asset Specificity**

This analysis illustrates the selection of market mode vs. hierarchy mode which is really a trade-off between contractual hazard and bureaucratic cost. Therefore, the fact that neither a banking system without a central bank (market mode) nor one with only a central bank (hierarchy mode) survived, whereas a banking system where a central bank and commercial banks co-existed (hybrid mode) did, indicates that from the perspective of asset specificity, central bank services are provided using assets of medium specificity. To verify this will require further investigation into the backdrop of this hypothesis, entailing examination of banking transactions as units of analysis.

2. Analysis of Transaction Costs in Interbank Transactions

We will show the reasons for the evolution and survival of the two-tiered banking system where both the central bank and commercial banks exist in the modern market economy by comparing transaction cost of the three types of banking systems.

2.1 Methodology

The unit of analysis in TCE being the transaction, analysis of a banking system based on this theory should take banking transactions as the unit of analysis. In the two-tiered banking system, banking transactions can be divided into transactions with customers (individuals and non-financial corporations) and interbank transactions. Since central banks deal almost exclusively with commercial banks, it will be sufficient to analyze only interbank transactions.

This means that we will only be analyzing a central bank’s function as the ‘bankers’ bank.’ A central bank also functions as the ‘bank of issue’ and the ‘bank for the government,’ and, while these functions are deeply interrelated with ‘bankers’ bank’ services, we have chosen to ignore them in this analysis.

Even when limiting the scope of analysis to the interbank market, the central bank is involved in a wide variety of transactions. Focus will be on two specific types: ‘interbank payment transactions’ and ‘interbank money transactions.’ We will also analyze ‘deposit transactions,’ in which a commercial bank holds deposits at another commercial bank or the central
bank. Deposit transactions usually involve either 'correspondent deposits' that are for making payments, or 'interbank loans' in which the deposit is made as a means of lending funds. As the first is a payment transaction and the latter a money transaction, we have not analyzed deposit transactions separately.

2.2 Transaction costs in a banking system with no central bank

Our first analysis considers the transaction costs for payment transactions and money transactions in a 'Type A' banking system as described in Section 1. A 'Type A' banking system corresponds to the 'market mode' of TCE, and our analysis will assume similarities between transaction costs in this type of banking system and those in a 'market mode' economic system.

A basic characteristic of this banking system is that commercial banks must engage in transactions in the interbank market with other commercial banks, but these same commercial banks compete with each other in the customer market. Goodhart (1988) says that there is considerable historical evidence of "conflicts of interest" (p. 8) among commercial banks. The competitive relationship means that commercial banks incur hazards when they sign contracts with one another. These hazards work as a built-in mechanism for increasing transaction costs. We may therefore conclude that this type of banking system is not viable.

Transaction costs of interbank payment transactions

i) Asset specificity of payment system

Even in a banking system that does not have a central bank, there is still need for interbank fund transfers between commercial banks. Commercial banks will be asked to send funds from their customers to the customers of another bank, and they will also need to settle funds traded on the interbank money market. Assuming that there is some form of cash — say, pieces of gold — even if there are no central banknotes, then settlements will to some extent be possible by physically transporting cash. This is, however, inconvenient when large value fund transfers are involved. Banks are therefore likely to come up with the idea of establishing a clearing house; indeed, clearing houses were in fact established in banking systems.

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7 Oritani (1993) studied links between payment systems and monetary economics.
that did not have central banks. Or a specific bank might serve as the "central commercial bank" (Goodhart, 1988, p. 37), with the payment services provided via deposit accounts with that bank.

The asset specificity of interbank payment systems like clearing houses is extremely high because it is difficult to redeploy the dedicated physical assets (including computer software) of the payment system to other purposes. In addition, payment system experts have a high degree of 'human asset specificity' since they learn their jobs through 'hands on' work. Another factor with respect to asset specificity is 'brand name capital' which reflects a system's reputation.

ii) Contractual hazards of payment transactions

Given the high asset specificity of the payment system, the contractual hazards discussed in 1.2 are inherent for both the providers and buyers of services.

Hazards for service providers

One hazard that providers of payment services face is that after having heavily invested in a system, they might lose customers (commercial banks) to another payment system before they can recover investment cost. There is high 'asset specificity' because it is difficult to redeploy the physical assets and human resources invested in a system. This is particularly true for computer-based payment systems because there is practically no possibility of redeploying software developed (for payment services) to other purposes.

The reason why providers may lose most of their customers is because, as TCE teaches, the action of customers is governed by opportunism. Because of bounded rationality, providers are unable to design contracts to completely prevent this. One strong incentive for customers to act opportunistically is that the provider of the service is itself a commercial bank, thus a competitor. Historically, there have been cases of systems with no central bank having a large commercial bank act as a central commercial bank in providing

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8 The New York Clearing House was in operation before the U.S. Federal Reserve System was established.
correspondent banking services including payment services. The hazards we described were inherent in these systems. Nor are they completely avoided by having a bankers' association own and manage the payment system (clearing house) because it is also a group of competitors (see 3.2).

Hazards for customers

There are also hazards for the customers (commercial banks) in a payment system that lacks a central bank. When a commercial bank utilizes a specific payment system, it adapts its computer systems and operational procedures to that system. It would therefore incur substantial damage should the provider of the system suddenly cease to provide services for whatever reason or should the customer commercial bank be discriminatorily refused services. Further, even if services continue, it has little choice but to pay service charges if a hike is demanded.

These hazards are high when services are received as part of correspondent banking services provided by a central commercial bank, because the service provider is a competitor. The central commercial bank is likely to act opportunistically, but the customer commercial bank will, because of bounded rationality, be unable to design a contract that entirely prevents this. Like the provider hazards, the customer hazards are not completely alleviated by having a bankers' association own and manage the payment system (clearing house) because the bankers' association is a group of competitors (see 3.2).

Even if the provider does not intentionally stop services, they may be brought to a halt by bankruptcy. When a central commercial bank provides payment services, the hazards are further compounded by the credit risk attaching to the deposits held with it for settlement.

Any payment system that does not use real time gross settlement (RTGS) will also incur 'systemic risk' because bankruptcy or failure to make payment by one customer commercial bank could adversely affect a large number of customer commercial banks. If the service provider also provides liquidity support, these risks could be prevented from emerging, but the provider is also a competitor and may selectively refuse liquidity support to specific customers for competitive
purposes. This is related to the arguments concerning interbank money transactions that will be discussed later in this paper.

iii) Governance structures of payment transactions

There are basically two types of governance structure to deal with these hazards.

The first is to use bilateral correspondent accounts. Commercial banks remain competitors, but they open accounts with each other (‘nostro’ and ‘vostro’ accounts) to facilitate interbank payments without having to depend on a specific commercial bank (central commercial bank). This governance structure corresponds to the ‘credible commitment’ described by Williamson (1985, 1996). Since both hold accounts of the other, contractual violation by one commercial bank can be responded to in ‘tit-for-tat’ fashion by the other. This method was actually used in banking systems that had no central bank (the United States prior to the establishment of the Federal Reserve System) and also in systems in which the central bank did not provide sufficient interbank payment services (prewar Japan, the Kyrgyz Republic after independence).

But this is extremely inefficient. It requires commercial banks to open correspondent accounts with a large number of other commercial banks and maintain idle balances for payments. The banks must also use different procedures for payment transactions involving different banks. This raises transaction cost.

The other structure is to establish a bank that does not compete with commercial banks — in other words, a central bank — and use it as a payment service provider. This banking system corresponds to types B and C (systems with central banks) in Section 1.

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Williamson defines a ‘credible commitment’ as "a contract in which a promise is reliably compensated should the promisor prematurely terminate or otherwise alter the agreements. This should be contrasted with noncredible commitments which are empty promises and semicredible commitments in which there is a residual hazard. Credible commitments are pertinent to contracts in which one or both parties invest in specific assets" (1996, p. 377).
Transaction cost of interbank money transactions

i) Information asymmetries of money transactions

Money transactions are a type of interbank transaction in which a commercial bank with a surplus lends money to a commercial bank with a shortage. Compared to payment transactions, this type of transaction has low 'physical' asset specificity. There is not that much in the way of physical assets that needs to be dedicated to these transactions. In point of fact, the market for these transactions has been around for a long time and is known as the 'interbank money market.'

But this is for a money transaction in a normal situation. In an abnormal situation, information asymmetries between the lender bank and borrower bank lead to extremely high 'informational' asset specificity for money transactions. Thus, money transactions are not made in the interbank money market in an abnormal situation.

A money transaction in an abnormal situation is, for example, when concern about a particular borrower bank's (or banks') financial condition is high, or a borrower is obliged to suddenly borrow a large amount just before market closing time.

Information asymmetries are a significant problem for money transactions in such abnormal situations. Lender banks do not have as much information regarding the borrower bank's ability to repay as the borrower bank itself has — in other words, information is distributed asymmetrically between lenders and borrowers. Not having enough information about financial conditions at the borrower bank, the lender bank may refuse the loan on the basis of rumors that the borrower is close to bankruptcy, even thought it might not be, because the lender has no way to judge the truth or falsehood of the rumors.

To deal with this problem, possible borrowers must dedicate the following resources to assets with high specificity. First, they must inform possible lenders about their management conditions, even in a normal situation. Vice versa, possible lenders must audit and monitor possible borrowers in order to accumulate information. Because this information the lender wants is not general information, asset specificity of the information is high. Second, possible lenders must build a long-term relationship with possible borrowers. Since this relationship cannot be redeployed to others, asset specificity of the relationship is high. Third,
possible borrowers might provide collateral to possible lenders. Shifting collateral that has been pledged to one lender to another is not easy. In this sense, asset specificity of collateral is high.

ii) Contractual hazards of money transaction in an abnormal situation

As mentioned above, possible borrowers will dedicate assets with high specificity, and even when a contract for money transactions is signed it is difficult to ensure that this will be a complete contract. The lender bank may act opportunistically and suddenly demand that the contract be interpreted much more strictly, or might even refuse to lend at all. Due to bounded rationality, the borrower bank will be unable to design a contract that completely covers every imaginable situation, and, given the time value of money, there is no time to take the issue to court. Also, it is difficult for the borrower bank to shift the dedicated assets from the lender bank to another bank in a short period of time considering the high specificity of assets, which means that the borrower faces a bilateral dependency problem with the possible lender.

To make matters worse, there are incentives for the lender bank to refuse loans. The lender and borrower compete with each other in the customer market, so the lender will tend to want the borrower to go under. Goodhart says the following about this tendency among commercial banks in correspondent relationships: "Moreover, there may always be, or it may be feared that there would be, a temptation for the central commercial banks to take the opportunity of a crisis to force a competitor out of business by not providing the loans/assistance that in more normal times a correspondent could have expected as a natural concomitant of the relationship" (1988, p. 38).

iii) Governance structure of money transactions under abnormal situations

As was not the case for payment transactions, for the borrower bank it is impossible to find a credible commitment to avoid these hazards. The only way is to set up a bank that does not compete with commercial banks — in other words, a central bank — and borrow from it. This is the 'lender of last resort' function that central banks provide. This banking system corresponds to types B and C (systems with a central bank) in Section 1.
2.3 Transaction cost of a banking system with a central bank only

In this part we analyze the transaction cost associated with a Type B banking system as described in Section 1. The Type B banking system corresponds to the 'hierarchy mode' (internal organization) in TCE and can therefore be assumed to have similar transaction costs. In this type of banking system, all transactions are considered to be internal transactions in a single organization.

Advantages over a commercial bank only system

Let us first examine some of transaction costs advantages this system has over a banking system in which there is no central bank (Type A).

In this banking system, payment transactions involve no hazards for either the provider or the customer of services since they are both part of the same bank. In other words, there is no risk that customers will move to another payment system before invested costs can be recovered, or that the provider will suddenly cut one off from services. Likewise, there are no credit risks stemming from the possible bankruptcy of the provider or systemic risks from the bankruptcy of a customer.

In this system, the relationship between the head office and branches of a single bank may correspond to that between providers and customers. One of its advantages is that the "internal organization can be more effectively audited" (Williamson, 1974, p. 29) should there be improprieties. Likewise, "when differences do arise, internal organization realizes an advantage over market mediated exchange in dispute settling respects" (Williamson, 1974, p. 29).

Meanwhile, in money transactions, the fact that this is a single bank turns interbank money transactions into 'inter-branch money transactions.' There need be no prior contracts to provide for a loan from branches with a surplus to those with a shortage. Money transactions can be engaged in flexibly according to circumstances. As Williamson says, "Internal organization often has attractive properties in that it permits the parties to deal with uncertainty/complexity in an adaptive, sequential fashion without incurring the same types of opportunism hazards that market contracting would pose" (1975, p. 25).
Disadvantages compared with the other types

The biggest problem with respect to this type of banking system is bureaucracy costs. In a commercial bank only system where there is no central bank, competition among commercial banks provides the "high-powered incentives of markets" (Williamson, 1996, p. 99). But in the central bank only case, there is no competition and therefore no incentive to be efficient; high-powered incentives are necessarily degraded when transactions move from Type A and Type C to Type B banking systems. This causes bureaucracy costs to rise, and potentially to exceed the advantages just discussed. In this connection, Williamson suggested the reason why the central bank only system could not survive as "almost surely, the added costs of bureaucracy are responsible for limitations in firm size" (1996, p. 17).

2.4 Transaction cost of banking system with both central bank and commercial banks

Finally, we will analyze the transaction costs for Type C banking systems as described in Section 1. Type C corresponds to the hybrid mode in TCE, so we will assume that the transaction cost analysis of the hybrid mode can be applied.

Advantages over the other types

This type of banking system is a mixture of types A and B, combining the strong points of both. It appears that at the current time only this type of system has survived. The two-tiered banking system corresponds to the 'hybrid mode' of economic system, of which Williamson has said, "the hybrid mode is located between market and hierarchy with respect to incentives, adaptability, and bureaucratic costs. As compared with the market, the hybrid sacrifices incentives in favor of superior coordination among the parts. As compared with the hierarchy, the hybrid sacrifices cooperativeness in favor of greater incentive intensity" (1996, p. 107).

Certainly, this type of banking system provides for competition among commercial banks, but the central bank does not compete with them. This is what Goodhart describes as "a noncompetitive non-profit-maximizing role that marked the true emergence and development of proper Central Banking" (1988, p. 9).
In other words, the central bank is the provider of services for payment transactions, while commercial banks are the customers of services. Even though the central bank and commercial banks are different entities, they do not compete with each other, which makes it possible to avoid the hazard seen in Type A that customers will shift to another payment system before the costs invested in the system are recovered. Likewise, there is no possibility that the provider (central bank) will suddenly cut off customers from services for any reason. The credit risk of bankruptcy for the central bank is also non-existent. At most, credit risks involve the problems raised by the bankruptcy of an individual commercial bank. This the central bank can also prevent, to some extent, by using its supervisory functions to audit and monitor commercial banks in much the same way as internal sections are audited in the hierarchy mode. The lender of last resort function of the central bank can provide liquidity support to a troubled bank in order to prevent systemic risk.

As for money transactions, the auditing and monitoring functions of the central bank also relieve to a great extent information asymmetry issues. As a supervisory organization, the central bank is able to use its auditing and monitoring functions during normal times to gain information on financial conditions at commercial banks. Should a commercial bank require a large sum of money that it is unable to borrow on the interbank money market, the central bank is able to provide the loan as the lender of last resort. Obviously, as a noncompetitive, non-profit-maximizing organization, the central bank has no incentive to drive the borrower bank out of business, and, as the bank of issue, the central bank enjoys an unlimited supply of funds.

The Type B banking system also has these advantages, but Type C combines them with the high-powered incentives of the market that Type B does not have. This is because the central bank and commercial banks do not compete, but commercial banks compete with each other. Compared to both A and B, Type C is clearly more efficient in terms of transaction cost. This is because Type C is the best governance structure of banking systems given the degree of asset specificity of interbank transactions. In other words, the banking system is one in which commercial banks engage in fair competition under the high-powered incentives of the market, while the central bank uses its auditing and monitoring functions to gather
appropriate information on commercial banks, and provides required payment and lending services.

As we have discussed above, we must conclude that the superiority of their transaction cost compared to the other types is the reason why central banks exist in a two-tiered banking system. In the future, there may be new banking systems that evolve so as to adapt to new institutional environments and the economization of transaction cost will be a key factor determining what these systems will look like.

3. Implications for Institutional Issues Relating to Central Banks

We have been able to use TCE to provide a theoretical explanation for the existence of central banks. We will now try to apply that theory to some issues we face today.

3.1 Evolution of a supernational central bank in a globalized market

Issue identification
Up until now, a central bank has existed within the banking system of a specific country. In other words, the central bank of one country does not open branches in another country, offering central bank services through them. Central banks have been defined as 'national central banks' (NCBs) and there has been no 'supernational central bank' (SCB). Large commercial banks (C/Bs), however, do cross national borders to set up branches and offer banking services. They are not limited to a specific country. As a result, interbank transactions cross national borders too. This has been even more so the case in recent years as financial globalization has enabled cross-border transactions to flourish.

The questions for us, in the context of financial globalization, are: What international financial services should central banks offer? and Why is cooperation among them necessary? We will investigate these applying the above theory.
Solution of issues

The TCE of central banks implies that central banks will need to globalize in response to the globalization of financial markets.

As we have seen, central banks evolved to economize transaction cost in the interbank market. But, while financial markets have globalized — many interbank transactions now cross national borders — central bank services have not. Therefore, what we have is a global market with no central bank services, resulting in large transaction costs to the global banking system, just as with the commercial banks only system\(^\text{10}\).

Many of the problems encountered in the global banking system are really quite easy to understand when viewed in the following terms. For example, ‘Herstatt risk’ comes about in cross-border interbank settlements because two currencies involved in a foreign exchange transaction cannot be settled by one central bank. Or, there is the question of who, in the context of interbank borrowing and lending, is to provide liquidity support to overseas branches of commercial banks — the central bank where the branch is located (the host central bank), or the central bank where the head office is located (the home central bank)? A similar question could be put with respect to which central bank is responsible for monitoring the foreign branches of commercial banks.

Globalization of central banks

In order to deal with these problems and economize transaction costs in the overall global banking system — in other words, to economize the transaction cost of interbank transactions in global markets — a new type of central bank will need to evolve, just as it did within the banking system of one country. This new central bank will be a ‘supernational central bank’ or ‘SCB,’ rather than a central bank within the banking system of a specific country. TCE yields the following insights into the SCB concept.

1) Three-tiered banking system

Figure 5 illustrates the basic hierarchical structure of a global banking system with an SCB. There are three distinct tiers because

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\(^{10}\) Gritani (1991) pointed out the globalization of risks resulting from the globalization of payment networks.
an SCB is added to the two-tiered banking system. As this structure is only a prototype, the variations below are possible.

**Figure 5 Three-tiered Banking System**

- **SCB**
- **NCBs**
- **C/Bs**
- **Customers**

ii) Central bank cooperation

We do not necessarily expect that an SCB will, from the beginning, be an established central bank integrating all NCBs. Rather, the degree of integration will gradually rise keeping pace with the globalization of financial transactions, with the establishment of an SCB as the ultimate goal. Over the course, central banks will cooperate to provide substitute services that the SCB will eventually be able to provide. We have already seen how there are two types of banking systems, depending on whether there is full integration between commercial banks and the central bank (fully integrated systems are Type B and non-fully integrated ones, Type C). Similarly, there can be many variations in the degree of integration between an SCB and NCBs in the international banking system\(^{11}\).

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\(^{11}\) When an SCB and NCBs are not fully integrated, there will be competition among NCBs. For example, NCBs may compete to gain wider usage of their respective currencies and settlement systems in global markets so they can enjoy greater seignorage. However, competition will not be as intense as that between commercial banks because NCBs have little, if any, pressure to pursue the profit motive.
iii) Regional SCBs and/or central bank cooperation

We also do not expect that there will, from the beginning, be just one global central bank that covers all the countries in the world. Rather, expectations are that SCBs will be established in regions where central bank cooperation is already advanced, with financial market linkages then becoming stronger before a single global central bank is established\(^\text{12}\).

**Developments**

These trends are evidenced by recent events, the most forceful of which is a plan to establish the European Central Bank (ECB) for EU members according to the Maastricht Treaty. The aim of the ECB is that it become the SCB for Europe. The globalization of financial transactions within the region has already resulted in the gradual strengthening of cooperation between the NCBs of EU members, which have now agreed that the integration of central banks is the ultimate structure they seek. The ECB will link the payment systems of NCBs to provide payment services (known as 'TARGET') and supply them with liquidity\(^\text{13}\). It will also serve as a bank of issue, printing the 'Euro.' However, NCBs and banking commissions will still have banking supervision responsibilities.

Though not from a true sense, the Bank for International Settlements, established in 1930, provides services as both an SCB and a forum for central bank cooperation. Recent trends towards globalization in financial markets have caused it to reinforce those services. As an SCB, it provides investment services for the foreign reserves of NCBs and functions as a lender of last resort to NCBs experiencing liquidity problems. Though it does not provide settlement services between NCBs, since 1986 it has provided private ECU settlement services to commercial banks. As a forum for central bank cooperation, it has been instrumental in many areas including banking supervision, coordinating regulations on issues such as capital adequacy.

Though perhaps not as dramatic as these examples, central banks in

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\(^{12}\) This corresponds to the optimal currency area theory. While the theory focuses on currency, our concept emphasizes the central bank as a 'bankers' bank' rather than the 'bank of issue.'

\(^{13}\) Oritani (1991) pointed out the importance of payment system linkages among EU members for success of the European Monetary Union.
many regions around the world are indeed strengthening their cooperation in response to the globalization of financial transactions. In the Asia-Pacific region, SEANZ and EMEAP are good examples of central bank cooperation. In 1995, Governor Fraser of the Reserve Bank of Australia proposed the establishment of an 'Asian version of BIS' as EMEAP's next step. This is a very good example of the evolution to an SCB. This is because an SCB is only needed when the volume of cross-border interbank transactions increases to a level where transaction costs without central bank services become very high. If financial market linkages in a region become stronger, the volume of transactions in that region increase to a commensurate level.

An example of the substitute services provided by central bank cooperation that an SCB will eventually provide is payment system linkages between NCBs. The purposes of such linkages range from the payment of social security funds to persons living abroad to a 'payment versus payment system' (PVP system). A PVP system enables the simultaneous settlement of two currencies involved in foreign exchange transactions and reduces Herstatt risk.

3.2 Bankers' associations vs. central banks

Issue identification

In the banking system of most countries, commercial banks have organized bankers' associations\(^\text{14}\), which are similar to central banks in that they provide services all commercial banks require. A central bank should probably be seen as the 'guardian of the bankers' club.' Its services as a bankers' bank are neither private goods nor public goods; rather, they are 'club goods'\(^\text{15}\) as Buchanan (1965) defined.

The service of bankers' associations that most interests us is the interbank payment facility. It has long been common practice for bankers'

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\(^{14}\) For our purposes, a bankers' association does not need to be so named. Any organized association, joint-stock bank, or similar institution to which commercial banks (deposit-taking institutions) belong or in which they have invested is considered a 'bankers' association' in this paper.

\(^{15}\) Oritani (1991) discussed the club-goods nature of central bank services. Goodhart described the central bank as "arbiter of bank club" (1988, p. 691).
associations to run clearing houses. In most countries, bankers' associations today operate 'automated clearing houses' (ACHs)\textsuperscript{16} utilizing computers. This has led to a debate with respect to payment system policy as to who should provide the international payment system, the private sector (bankers' associations) or central banks\textsuperscript{17}. Debate has for the most part focused on risks, noting that they are higher for netting provided by clearing houses because, unlike the payment services of central banks, they have no finality. It is also necessary to compare the nature of the two organizations, bankers' associations and central banks, that provide payment services.

In addition to payment services, bankers' associations provide services similar to the banking supervision of central banks, setting regulations among members. Corresponding to the lender of last resort function of central banks is the signing of mutual assistance agreements, providing for the extension of emergency loans to one another. Some bankers' associations, such as the central institutions of credit unions, have also been established to pool the deposits taken in by their members for joint investment. Services provided by bankers' associations that are not provided by central banks include the exchange of information and training services for member employees.

The questions raised are: What is the difference between a bankers' association and a central bank? Or, in what sense are bankers' associations regarded as 'private sector entities'? And, what sort of division of labor should exist between a bankers' association and a central bank? It will therefore be worthwhile to examine the two actors, bankers' associations and central banks, in terms of TCE, especially in the provision of payment services.

\textsuperscript{16} Examples include Japan's 'Zengin System,' an ACH run by the Federation of Bankers' Associations of Japan, or the US CHIPS and the UK CHAPS, both of which are run by respective national bankers' associations. Note that the US also has two types of ACH, one run by private companies and the other by the Federal Reserve Banks.

\textsuperscript{17} There is also a controversy in international finance over whether it should be the bankers' association or central bank that provide a PVP system. The Noel Report (1993) supported the idea that it should be central banks; the McDonough Report (1996), that it should be the private sector, bankers' associations.
Peer group theory

Chapter 3 of Williamson (1975), “Peer Groups and Simple Hierarchies,” uses TCE to analyze peer group associations\(^{18}\). He defines peer group association as a perfectly flat organization that, although not a market, does not recognize any hierarchies among members\(^{19}\). In analyzing employment relations, he explains peer group association as a kind of “non-market organization” that “may have attractive properties in relation to the market” (1975, p. 45). He also analyzes the choice between peer groups or simple hierarchies. As was defined in Section 1, ‘markets’ signify spot transactions in the markets and ‘simple hierarchies’ long-term relationships in internal organization.

As was studied in sections 1 and 2, we can regard banking systems without central banks as ‘markets,’ ‘bankers’ associations as peer group associations, and the central banks as simple hierarchies, which enables us to adopt Williamson’s peer group theory to compare bankers’ associations and central banks.

Advantages of peer group associations

Williamson argues that there are three advantages to the services of peer group associations compared to spot transactions in the markets:

1) Indivisibility

Economies of scale are gained in terms of the physical assets and information that members acquire, which makes it advantageous to organize peer group associations.

2) Risk bearing

There will be a kind of insurance in the form of providing income guarantees to buffer the effect of unanticipated contingencies on members.

3) ‘Involvement relations’ between group members

\(^{18}\) Chapter 9 of Williamson (1985) also analyzes peer groups.

\(^{19}\) Therefore, a peer group association is a kind of hybrid mode, but close to the market mode.
This refers to productivity increases among members who feel a sense of responsibility to do their fair share as members of the group. In other words, the members tend to contribute to the joint interests of the group voluntarily based on a kind of friendship. Peer group associations enable valuable involvement relations that are upset, in some degree, by hierarchies. As the degree of hierarchy increases, involvement relations become less pronounced. In other words, the degree of bureaucracy increases.

Limitations of peer group associations

However, peer group associations do have their limitations because of the following reasons and these limitations prevent the group from fully displacing other modes of organization, according to Williamson:

i) Limitations to the communication of information

A peer group association is limited for reasons of bounded rationality with respect to both communication and decision-making. Figure 6 (a) illustrates the information processing that occurs in a peer group association. It is an 'all-channel network.' Everything should be communicated to everyone and joint decisions reached. Since the number of linkages in all-channel networks increases as the square of members, the size of a peer group association is inevitably restricted. These limitations become serious when disputes between members must be settled or when the peer group association attempts to adapt to new circumstances.

If, for example, a leader is chosen in order to resolve these issues, then the association becomes essentially the same as a hierarchy. It will in any case have to face the trade-off between performance and peer group democracy.
Figure 6 Information Flow Network

(a) All-Channel Network  (b) Wheel Network

*Source: Williamson (1975, p. 46).*

ii) Loose auditing and monitoring

Free-rider problems are inevitable in peer group associations since opportunism and information asymmetries exist among members. Indeed, we might go so far as to say that peer group associations are vulnerable to free-rider abuses because the peer group is inherently limited as an auditing and monitoring instrument.

If the peer group tries to perform the necessary audits, it would violate both the letter and spirit of the peer group, which would, in turn, negate involvement relations, one of the most important advantages of a peer group association.

iii) Competition problems

Williamson does not directly lead with competition in his peer group theory, but, following his TCE (discussed in Section 1), it is reasonable to conclude that there will be inevitable competitor-problem limitations similar to the market mode. This is because peer group associations are flat organizations whose members are also competitors and who may be just as opportunistic in their activities as they are in their market transactions.
Advantages of hierarchies

Williamson points out the advantages of hierarchies in comparison with the limitations of peer group associations:

i) Economies of information

Hierarchical organizations make it cheaper and more efficient to transmit all information because both information and decision-making are centralized. This is illustrated in Figure 6 (b), which shows that supplanting the all-channel network in a peer group association with a wheel network (in which each member is connected only with the center) yields savings in terms of both information transmission and decision-making.

ii) Auditing and monitoring

Hierarchies have clear advantages because a supervisor is assigned the task of auditing. Auditing serves to overcome opportunism and information asymmetries, and also solves the free-rider problem.

iii) Fair treatment of competitors

While Williamson does not treat this point specifically, 'leaders' or 'coordinators' in a hierarchy mode are not in a competitive relationship with members (unlike the relationship among the members of a peer group association) and therefore have the advantage of being able to treat competitors fairly.

Choice of peer group association or hierarchy

In the real world, a choice must be made between peer group association or hierarchy as to which mode of organization best serves the purpose of economizing transaction costs.

Williamson says, “It would appear that the simple hierarchy can do everything the peer group can do and more” (1975, p. 54). And to the question, “What then prevents the peer group from being fully displaced by a simple hierarchy?” (1975, p. 55), he suggests ‘involvement relations’ as the main reason. As we have already noted, when the degree of hierarchy increases, involvement relations become less pronounced and therefore the degree of bureaucracy increases. Along with it, bureaucracy cost increases.
Figure 7 provides a simple illustration of this relationship\textsuperscript{20}. As the degree of hierarchy increases, the cost inherent in peer group associations (information cost, loose auditing and monitoring cost, and cost associated with competition problems) declines (Curve P). However, at the same time, involvement relations also diminish, so bureaucracy cost increase (Curve H). Therefore, the optimum degree of hierarchy $h^*$ is determined at the point of minimum cost $c^*$ according to the nature of the transaction.

From a different viewpoint, this indicates that a hierarchical organization might be superior to a peer group association, even given a higher degree of hierarchy, if involvement relations are strengthened so that bureaucracy cost does not rise (this would involve the downward shift of Curve H to Curve $H'$ in the figure). On the other hand, it is difficult for a peer group association to take advantage of hierarchical organization for the purpose of reducing costs inherent within itself. This is because even a very small degree of hierarchy goes against the essential nature of the organization i.e. involvement relations. According to Williamson, the introduction of leaders and auditing to peer group association are understood as “whatever it may be called, it is functionally equivalent to introducing hierarchy” (1975, p. 53).

\textbf{Figure 7 Costs as a Function of Degree of Hierarchy}

\textsuperscript{20} Figure 7 is regarded as a modified version of Figure 4.
Application to banking systems

It can be easily understood from the foregoing peer group theory that a bankers' association is a kind of peer group association. However, it may require some explanation to understand that a central bank is a hierarchy. Section 1 saw the banking system with both a central bank and commercial banks as a 'hybrid mode' economic system located somewhere between the 'market mode' and 'hierarchy mode.' However, when comparing the two organizations, a bankers' association and a central bank, a central bank has a considerably higher degree of hierarchy in its relations with commercial banks than it does with a bankers' association. Unlike the bankers' association, commercial banks do not control the management of the central bank, nor are central bank executives chosen strictly from among commercial bankers. In addition, most central banks also function as the supervisor of commercial banks.

Let us proceed from this analogy to examine the advantages and limitations of bankers' associations, and the advantages of central banks.

Advantages of bankers' associations

The three advantages that Williamson found for peer group associations appear to apply to bankers' associations as well:

i) Indivisibility

There are obvious economies of scale associated with payment systems such as clearing houses. There are also economies of scale in information, which is why members use bankers' associations to exchange information and train staff.

ii) Risk bearing

For example, in Japan, regional bankers' associations have a mutual assistance fund endowed with contributions from members. Should a member bank experience business difficulties, it can turn to the fund for financial assistance.

iii) Involvement relations

Although the positive impact of involvement relations on members' management policies is unmeasurable, one can assume that if there were
no positive effects bankers' associations would not be viable.

Limitations of bankers' association

i) Limitations on the communication of information

As with peer group associations, this could be a serious problem for bankers' associations, but generally it is not too serious by means of appointing leaders and executives to centralize information and decision-making. Naturally, this brings a corresponding diminution in involvement relations, and some amount of bureaucratic slack is indeed observed in most bankers' associations.

ii) Loose auditing and monitoring

Many bankers' associations espouse self discipline and have regulations, but few are strict. In almost no cases do they perform on-site examination. As Goodhart says, there are "doubts (as to) whether the group of central commercial banks, or the clearing house(s), could be sufficiently independent to act as arbiter for the 'club' of banks, limiting entry and monitoring behavior, so as to cope with the free rider problem" (1988, p. 103).

iii) Competition problems

This is the most serious problem, for as Goodhart has noted with respect to clearing houses, there is competition among commercial banks and they may take the opportunity a crisis affords to force a competitor out of business: "Since it is now argued that support/supervisor quasi-Central Banking activities may be provided by clearing houses ... it is as well to note that such commercial conflicts of interest may also exist in this latter case (clearing houses). Such conflicts appeared to play a part in the 1907 financial crisis occurring in New York" (1988, p. 38-39).

Though not as serious as the concern above, Goodhart also notes the potential for action that goes against the principle of fair trade: "One of the main functions of the clearing house was to maintain discipline ... Insofar as that function is carried out by one main bank, the conduct of that discipline may be seen by competitors as,
and may indeed in some cases actually be, unfair, and certainly unwanted, competition" (1988, p. 37).

Because these competition problems are serious, Japanese credit unions (whose cooperative relationships are so deep that they have established central institutions) make some agreements limiting business territory.

Advantages of a central bank

i) Economies of information

Though central banks are not pure hierarchies, they have a higher degree of hierarchy than bankers' associations and so enjoy one of the advantages of hierarchical organizations, economies of information. In terms of Figure 6, the information flow and decision-making structure of bankers' associations is closer to that of an 'all-channel network,' while that of central banks is closer to a 'wheel network.'

ii) Auditing and monitoring

Just as with a hierarchy, even if central banks audit and monitor commercial banks, this does not contradict the substance of a central bank. In fact, most central banks do indeed function as the supervisor of commercial banks and are responsible for matters from on-site examination to regulations.

This is an effective way to avoid the free-rider problem of commercial banks. For example, when a bankers' association runs a payment system, it is unable to sufficiently monitor members. Thus, there is systemic risk that 'bad' members will, via the payment network, cause trouble for 'good' members. Bankers' associations therefore have a much harder time running payment systems than do central banks. Additionally, both the mutual assistance funds of bankers' associations and the lender of last resort function of central banks may present moral hazard to commercial banks. However, central bank supervision is an effective way to avert moral hazard (see 3.3).

iii) Fair treatment of competitors

As in a hierarchy, central banks are not in competition with commercial banks and therefore do not experience the competition
problem that bankers' associations would.

Choice of bankers' association or central bank

We have shown Williamson's peer group theory to be applicable to financial transactions. Therefore, arguments over the choice of peer group association or hierarchy apply to the debate on bankers' associations vs. central banks. Therefore, let us interpret within the context of the bankers' association/central bank debate, the idea of strengthening involvement relations so that bureaucracy cost does not rise even though there is a higher degree of hierarchy (in other words, the shift of Curve H downward to Curve H' in Figure 7).

With the payment system provided by the central bank, strengthening involvement relations means arriving at an appropriate design for the central bank governance structure so that bureaucracy cost can be lowered. More specifically, this involves improving central bank transparency and accountability vis-à-vis commercial banks who are the users of the interbank payment system, seeking out the opinions of commercial banks, and providing tailored services to commercial banks at arm's length. One idea might be the good use of a 'national payment committee.' Were central banks to make these kinds of efforts it would in many cases be appropriate from the perspective of transaction cost economization that they, rather than bankers' associations, provide such services as ACHs and PVP systems.

3.3 Central bank as supervisor

Issue identification

One issue in the two-tiered banking system that has received a great deal of attention recently is who should supervise commercial banks, the central bank, a government agency, or the deposit insurance agency? Studies must take into account a wide variety of issues, including consistency with the purposes of the agencies involved and independence from political pressure.

In sections 1 and 2 we considered the banking system as a single system and applied TCE to uncover new perspectives on the relationship between central banks and commercial banks. Let us now use these arguments to consider the issue.
Application of TCE

To jump straight to the conclusion, the central bank is the most appropriate supervisor. There are at least three reasons:

First, TCE shows that when the market mode is compared with the other two modes (hierarchy and hybrid), the main reason they are more advantageous than the market mode in terms of transaction costs is that they have auditing and monitoring functions that the market mode does not\(^{21}\). Applying this to the banking system, the main reason types B and C are more advantageous than Type A in terms of the transaction cost of interbank transactions is that the central bank is able to engage in auditing and monitoring i.e. banking supervision.

Second, this is especially true for interbank money transactions. In 2.1, it has been pointed out that the possible lenders must audit/monitor possible borrowers in order to accumulate information about their conditions even in a normal situation. As the central bank is the best possible lender in an abnormal situation in terms of transaction costs, the central bank is the most appropriate supervisor.

Third, TCE shows that internal auditors are better than external auditors. Says Williamson, "The auditing advantage of internal organization in relation to inter-firm organization is attributable to constitutional and incentive differences which operate in favor of the internal mode. An external auditor is typically constrained to review written records and documents and in other respects restrict the scope of his investigation to clearly pertinent matters. An internal auditor, by contrast, has greater freedom of action, both to include less formal evidence and to explore the byways into which his investigation leads" (1975, p. 29-30).

It is possible to see the 'internal auditor' as the central bank and the 'external auditor' as the government agency. The reason for this is that when the monobank system of Type B is divided into the two-tiered system of Type C, what has taken place is a separation of the central and commercial banks. In this sense, the central bank is still an organization within the

\(^{21}\) The advantages of hierarchy, in which the supervisor is expressly assigned the task of auditing, have been discussed also by Alchian and Demsetz (1972).
banking system. By contrast, the government agency is outside the system in Type B, and in Type C only becomes more of an outsider. The central bank has emerged from the market of commercial banks.

Being in the banking system, the central bank enjoys more efficient communication with commercial banks than the government agency, which is an outsider. In TCE, "A further advantage of internal organization is that, as compared to recurrent market exchange, efficient codes are more apt to evolve and be employed with confidence by the parties. Such coding also economizes on bounded rationality. Complex events are summarized in an informal way by using what may be an idiosyncratic language" (Williamson, 1975, p. 25).

Certainly the central bank, being a bank itself and therefore engaged in banking operations, has the advantage of being able to understand the 'codes' used by commercial banks better than an organization not so engaged. This becomes even more apparent when Type C's two-tiered system is seen as a division of the single-tiered Type B system into central and commercial banks.

3.4 Clients and business scope of central banks

Issue identification

A central bank's clients are institutions that have opened accounts with it, have borrowing agreements with it, use services provided by it, or enjoy some other, similar relationships. While there is a broad consensus that commercial banks ought to be clients of the central bank, there is still much argument over whether to include other financial institutions and non-financial corporations. Among financial institutions, the question hinges on the inclusion of, for example, securities companies, securities brokers, and small-scale depository institutions such as credit unions.

There are also the issues concerning the scope of the central bank's business. For example, should it engage only in financial business, or should it engage in the same kind of commercial business as non-financial corporations and, if so, under what standards?
Application of TCE

Applying TCE to both these issues, a single principle indeed serves to answer both questions. That principle is that central banks should choose their clients and businesses so as to avoid competition. As we have seen in Section 2, when there is competition there are also opportunistic and contractual hazards that raise transaction cost. One of the basic advantages of the Type C two-tiered banking system is that the central bank is not a competitor.

Applying this principle to the question of central bank clients, we find that when financial institutions and non-financial corporations compete with commercial banks, it is meaningful to include them as clients of the central bank. For example, if a securities company competes with commercial banks, it is not desirable for it to have to depend on the banking services of a commercial bank because that will make the commercial bank privy to information about the securities company's transactions. The central bank needs to take the securities company on as a client in order to ensure fair competition between it and the commercial bank. In an extreme case, were a non-financial corporation to compete with a commercial bank, then the central bank should allow the non-financial corporation to become a client.

Applying the same principle to the scope of central bank business, the central bank should avoid competition with its clients. For example, it should avoid taking on as clients securities companies and non-financial corporations because they are the clients of commercial banks. This can lead to conflicts with the first point we made, and in such cases the yardstick to be used is the intensity of competition between commercial banks on the one hand and securities companies and non-financial corporations on the other. If competition is intense, then the central bank may be justified in taking them on as clients.

There can be no justification for the central bank entering businesses conducted by non-financial corporations. Doing so would bring it into competition with non-financial corporations, and this is far different from the argument that the central bank (from a position of neutrality) should provide banking services to non-financial corporations when commercial banks are in direct competition with them.
Conclusion

It has been very useful to apply the theories of New Institutional Economics, particularly TCE, to the institutional issues of central banks. Indeed, this theoretical approach to these issues deserves to be explored more deeply, perhaps by applying other theories stemming from TCE. For example, the corporate governance theory\textsuperscript{22} based on TCE would surely contribute to study of the governance structure of central banks.

Our study has focused on the central bank's function as a 'banker's bank,' but the central bank also serves as the 'bank of issue' and the 'bank for the government.' TCE may have much to say about the institutional issues involved in these aspects of central bank functions as well. In other words, the economies of scope theory re-interpreted from TCE\textsuperscript{23} would be useful in analyzing the relationships between the different functions of central banks.

This paper is the first attempt to apply TCE to the institutional issues of central banks and, while the conclusions reached in Section 3, Implications for Institutional Issues Relating to Central Banks, are too simplistic being based on some specific theoretical assumptions, our understanding of central banks has been deepened.

\textsuperscript{22} Refer to Corporate Governance, Chapter 12 of Williamson (1985).

\textsuperscript{23} Refer to Teece (1980).
Explanation of Figure 4, Governance Costs as a Function of Asset Specificity

— Excerpts from Williamson (1996, p. 106-108)—

Although asset specificity can take a variety of forms, the common consequence is this: a condition of bilateral dependency builds up as asset specificity deepens. The ideal transaction in law and economics—whereby the identities of buyers and sellers is irrelevant—obeys when asset specificity is zero. Identity matters as investments in transaction-specific assets increase, since such specialized assets lose productive value when redeployed to best alternative uses and by best alternative users.

Assume, for simplicity, that asset specificity differences are entirely due to physical or site specificity features. I begin with the situation in which classical market contracting works well: autonomous actors adapt effectively to exogenous disturbances. Internal organization is at a disadvantage for transactions of this kind, since hierarchy incurs added bureaucratic costs to which no added benefits can be ascribed. That, however, changes as bilateral dependency sets in. Disturbances for which coordinated responses are required become more numerous and consequential as investments in asset specificity deepen. The high-powered incentives of markets here impede adaptability, since each party to an autonomous exchange that has gotten out of alignment and for which mutual consent is needed to effect an adjustment will want to appropriate as much as possible (ideally, all but epsilon) of the adaptive gains to be realized. When bilaterally dependent parties are unable to respond quickly and easily, because of disagreements and self-interested bargaining, maladaptation costs are incurred. Although the transfer of such transactions from market to hierarchy creates added bureaucratic costs, those costs may be more than offset by the bilateral adaptive gains that result.

Let \( M = M(k; \theta) \) and \( H = H(k; \theta) \) be reduced-form expressions that denotes market and hierarchy governance costs as a function of asset specificity \( k \) and a vector of shift parameters \( \theta \). Assuming that each mode is constrained to choose the same level of asset specificity, the following comparative-cost relations obtain: \( M(0) < H(0) \) and \( M' > H' > 0 \). The first of these two inequalities reflect the fact that the bureaucratic costs of internal organization exceed those of the market because the latter is superior in adaptation (A) respects—which is the only kind that matters if asset specificity is negligible. The intercept for market governance is thus lower than is the intercept for hierarchy. The second inequality reflects the marginal disability of markets as compared with hierarchies in adaptation (C) respects as asset specificity, hence bilateral dependency, becomes more consequential.
As described above, the hybrid mode is located between market and hierarchy with respect to incentives, adaptability, and bureaucratic costs. As compared with the market, the hybrid sacrifices incentives in favor of superior coordination among the parts. As compared with the hierarchy, the hybrid sacrifices cooperativeness in favor of greater incentive intensity. The distribution of branded product from retail outlets by market, hierarchy, and hybrid, where franchising is an example of this last, illustrates the argument.

Forward integration out of manufacturing into distribution would be implied by hierarchy. That would sacrifice incentive intensity but would (better) assure that the parts do not operate at cross-purposes with one another. The market solution would be to sell the good or service outright. Incentive intensity is thereby harnessed, but suboptimization (free riding on promotional efforts, dissipation of the brand name, etc.) may also result. Franchising awards greater autonomy than hierarchy but places franchisees under added rules and surveillance as compared with markets. Costs control and local adaptations are stronger under franchising than hierarchy, and suboptimization is reduced under franchising as compared with the market. The added autonomy (as compared with hierarchy) and the added restraints (as compared with the market) under which franchisees operate nevertheless come at a cost. If, for example, quality assurance is realized by constraining the franchisee to use materials supplied by the franchisor, and if exceptions to that practice are not permitted because of the potential for abuse that would result, then local opportunities to make "apparently" cost-effective procurements will be prohibited. Similarly, the added local autonomy enjoyed by franchisees may get in the way of some global adjustments.

Transactions for which the requisite adaptations to disturbances are neither predominantly autonomous nor bilateral, but require a mixture of each, are candidates to be organized under the hybrid mode. Over some intermediate range of \(k\), the mixed adaptation (A/C) that hybrids afford could well be superior to the A-favoring or C-favoring adaptations supported by markets and hierarchies, respectively.

Letting \(X = X(k; \theta)\) denote the governance costs of the hybrid mode as a function of asset specificity, the argument is that \(M(0) < X(0) < H(0)\) and that \(M' > X' > H' > 0.\) The relations shown in Figure 4.1 then obtain. Efficient supply implies operating on the envelope, whence, if \(k^*\) is the optimal value of \(k,\) the rule for efficient supply is as follows: I, use markets for \(k^* < \bar{k}_1;\) II, use hybrids for: \(\bar{k}_1 < k^* < \bar{k}_2;\) and III, use hierarchy for \(k^* > \bar{k}_2.\)
References


