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Inflation versus central bank independence? Banking regulation and financial stability in the US and Germany

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Inflation Versus Central Bank Independence?
Banking Regulation and Financial Stability in
the U.S. and Germany

Sigurt Vitols

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Sigurt Vitols

**Inflation Versus Central Bank Independence?
Banking Regulation and Financial Stability in
the U.S. and Germany**

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Abstract

Most recent discussion of the relationship between the banking system and macroeconomic performance have focused on the degree of independence of the central bank as the key variable influencing the choice between inflation and unemployment. This paper argues that the stability of the financial system is a goal of central banks with at least as much priority as the other two goals, and that tight money policies implemented to achieve monetary stability may conflict with the goal of financial system stability; furthermore, the nature of regulation and underlying health of the financial system is a crucial factor influencing the extent of the monetary versus financial system stability tradeoff dilemma.

The erosion of prudential regulation and increasing weakness of large segments of the financial system in the US, in large part due to "arbitrage" between competing regulatory authorities, has since the 1960s put the Federal Reserve Board in the dilemma of controlling inflation versus protecting financial system stability. The German *Bundesbank* in contrast has had a freer reign in monetary policy, since corporatist bank regulation including strict prudential standards and the prohibition of potential bank competitors has resulted in a stronger underlying financial structure.

Zusammenfassung

In jüngster Zeit hat sich die Debatte um den Zusammenhang zwischen dem Bankensystem und makroökonomischen Variablen - vor allem der "Trade Off" zwischen Inflation und Arbeitslosigkeit - um den Grad der Unabhängigkeit der Zentralbank von der (Regierungs-)Politik konzentriert. In diesem Papier wird die These entwickelt, daß die Stabilität des Finanzsystems ein genauso hochrangiges Ziel von Zentralbanken ist wie die Geldwertstabilität und das Beschäftigungsniveau. Das Erreichen des Ziels "Geldwertstabilität" durch eine straffe Geldpolitik kann das Ziel "Finanzsystem-Stabilität" gefährden. Das Ausmaß dieses "Dilemmas" wird durch die Effektivität der Regulierung und die Stärke der Finanzinstitute bestimmt.

Die Unterminierung der Regulierung und die Schwächung von großen Segmenten des us-amerikanischen Finanzsystems durch "arbitrage" zwischen miteinander konkurrierenden Regulierungsbehörden hatte seit den sechziger Jahren die Federal Reserve Board, die US-Zentralbank, vor die Wahl zwischen Geldwertstabilität und Finanzsystem-Stabilität gestellt. Im Gegensatz dazu hat die korporatistische Regulierung des deutschen Finanzsystems, die durch strenge Regeln und das Verbot potentiell mit den Kreditinstituten konkurrierender Finanzinstitute gekennzeichnet ist, zu einem stärkeren Finanzsystem geführt und so der Deutschen Bundesbank einen größeren Spielraum in der Geldpolitik gewährt.

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0. Introduction

The attempt to explain cross-national differences in macroeconomic performance since the 1970s has spawned a rich literature in comparative political economy. Two explanatory paradigms have dominated this debate, focusing on wage bargaining institutions and the independence of the central bank from government, respectively. According to the first explanation, encompassing corporatist wage bargaining systems are better able to constrain wage demands from "stronger" sectional interests than fragmented bargaining systems; as a result, countries with the first type of bargaining system are better able to control inflationary pressures from labor markets under conditions of full or near-full employment than countries with fragmented systems. According to the second explanation, politicians place a lower priority on low inflation than central bankers, particularly near elections; thus, inflation is lower and more stable in countries in which central banks are "independent" of the political system and thus better able to resist political pressures for expansive monetary policies to decrease unemployment. Furthermore, the resulting greater "credibility" of central bank policies may have additional benefits such as a lower real interest rate.¹

This paper argues that a third institutional factor, the financial regulatory system, should also be taken into account in explaining cross-national differences in macroeconomic performance. The first reason for including this variable is that the financial system itself can be a cause of inflation and macroeconomic instability. Like the real economy, the financial system also has a tendency towards cyclical behavior in credit creation. Many industrialized countries in the past few decades have been characterized by increasing volatility in the financial cycle, in a few cases taking the form of inflationary credit-financed speculative booms punctuated by spectacular decreases in the availability of credit (the "speculative boom-credit crunch cycle"). The nature of regulation of the financial system is an important determinant of the underlying tendency of the financial system towards instability. The second reason for including this variable is that, while most of the literature on monetary policy focuses on the tradeoff between unemployment and inflation, the major goal of financial regulation is in fact to prevent a breakdown of the financial system such as that which occurred in the early 1930s in many industrialized countries. Central banks, including those which are "independent" of government and direct responsibility for unemployment, must take into account the risk that a

¹ For a summary of the central bank independence literature see Alesina and Summers (1993). For examples of the corporatist explanation see Soskice (1990) and Lange and Garrett (1985). For recent attempts to combine the two explanations see Iversen (1995), Streeck (1993) and Hall (1994).

tight monetary policy could set off a financial crisis through mass defaults on financial obligations, a deflation in the value of financial assets and the insolvency of financial institutions. The strength of this "financial system stability" constraint on tight monetary policies increases with the weakness of the financial system, which is in turn dependent upon the nature of financial system regulation.

The importance of including financial system regulatory variables in explaining cross-national differences in macroeconomic performance is illustrated in a comparison of financial regulation and monetary policy in the US and Germany in the past three decades. Despite the fact that both countries have highly independent central banks² some aspects of macroeconomic performance have been significantly different. The inflation rate in the US was roughly twice as high as in Germany in the past two decades. Especially dramatic was the difference in the second half of the 1970s when Germany had but the US had not yet begun to reverse the "upward ratcheting" nature of increasing inflation; in 1979, for example, the US had an inflation rate nine percentage points higher than Germany (13% versus 4%). The US financial system has also been characterized by greater instability in the credit creation process with respect to the availability and cost of credit; using one measure of volatility, the coefficient of variation in the quarterly change in bank credit provided to the economy, credit creation was roughly 60% more volatile during the 1960s and 1970s and 90% more volatile since 1980 in the US than in Germany (see Table 1). Furthermore, the US financial system has frequently (in 1966, 1970, 1974, 1982, 1987, and 1989-92) experienced deep credit crunches involving sharp cutbacks in the amount of credit provided and a rationing of credit to the most creditworthy customers. Both higher inflation and greater instability in the credit creation process have negative effects on real investment and the capacity to plan long-term.³

The argument developed here is that differences in the nature of financial system regulation in the two countries, in particular the higher degree of regulatory fragmentation in the US than in Germany, are a key determinant of monetary policy. The degree of regulatory fragmentation is a major factor determining the extent of "regulatory arbitrage", i.e. the tendency for funds to flow to less-regulated sectors. Regulatory arbitrage is a constraint on regulators' capacity to impose constraints such as prudential standards for "maturity mismatch" (i.e. the degree to which financial intermediaries are allowed to use short-term funds to finance long-term investments) and minimum requirements for capital, the "safety cushion" for financial intermediaries against unusually high levels of risk. Weakness in the first increases the risk of

² Attempts to rank the Federal Reserve Board and the Bundesbank by degree of independence consistently place both near or at the top of the scale (Alesina and Summers 1993).

³ For recent attempts to model and measure the effects of uncertainty on investment see Pyndyck and Solimano (1993) and Dixit (1993).

Table 1:
Volatility in Credit Creation Process, US and Germany
Quarterly % Change in Bank Credit Outstanding

	Coefficient of Variation		Ratio
	US	Germany	US/Germany
1960-70	0.4799	0.30577	157%
1970-80	0.6137	0.37108	165%
1980-94	0.7004	0.36844	190%

Source: Own Calculations from Federal Reserve Board Flow of Funds Accounts and OECD Historical Statistics

liquidity crises in the financial system (i.e. the danger that financial institutions will be unable to satisfy sharp increases in withdrawals from depositors due to the "lock-up" of these funds in long-term investments); weakness in the second increases the risk of solvency crises. The probability of both liquidity and solvency crises, which increase with a tightening of monetary policy, is a substantial constraint on the ability of central banks to control inflation.

The US has a fragmented, pluralist financial regulatory system characterized by competition between different financial sectors and a "dual" state-federal banking system; the resulting high degree of regulatory arbitrage has hindered the development of standards for minimum capital levels and maturity matching, thereby leading to the progressive weakening of the financial structure. The frequent outbreak of liquidity and solvency crises have been a direct constraint on the Federal Reserve Board's ability to control inflation and a cause of credit crunches. Furthermore, the volatile flow of funds from one sector have rendered the relationship between financial variables such as bank reserves, monetary aggregates and bank credit unstable, hampering the effectiveness of monetary policy. Germany in contrast is characterized by a corporatist, bank-based financial regulatory system in which banks are protected from competing institutions and in which associations play a key role in governance, particularly for smaller banks without direct access to capital markets. German regulators have been less constrained by the problem of regulatory arbitrage in modifying bank regulations to take account of new developments and risks in financial systems; as a result of the sounder and less volatile financial system, the Bundesbank has been less constrained by concerns over financial system stability during periods of tightening. With the removal of the main constraint on fighting domestic inflation during the 1960s and early 1970s, the Bretton Woods system of fixed exchange rates, the Bundesbank was able to rapidly bring down the upward ratcheting of inflation.

1. The Inflation versus Financial System Stability Dilemma

Both the literatures focusing on wage bargaining institutions and central bank independence focus on the problem of the tradeoff between inflation and unemployment. The well-known Phillips curve summarizes the tradeoff between potentially achievable levels of inflation and unemployment; the Phillips curve is normally downward sloping, i.e. lower inflation can be achieved at the expense of higher unemployment and vice versa (see Figure 1). Monetary policy can attempt to push an economy from one point to another on the Phillips curve. For an economy at point A on the diagram characterized by a level of unemployment U_0 and inflation P_0 , a tighter monetary policy (implemented through targeting a lower rate of growth in the money stock and/or higher interest rates) should lower price inflation at the expense of

FIGURE 1: The Phillips Curve

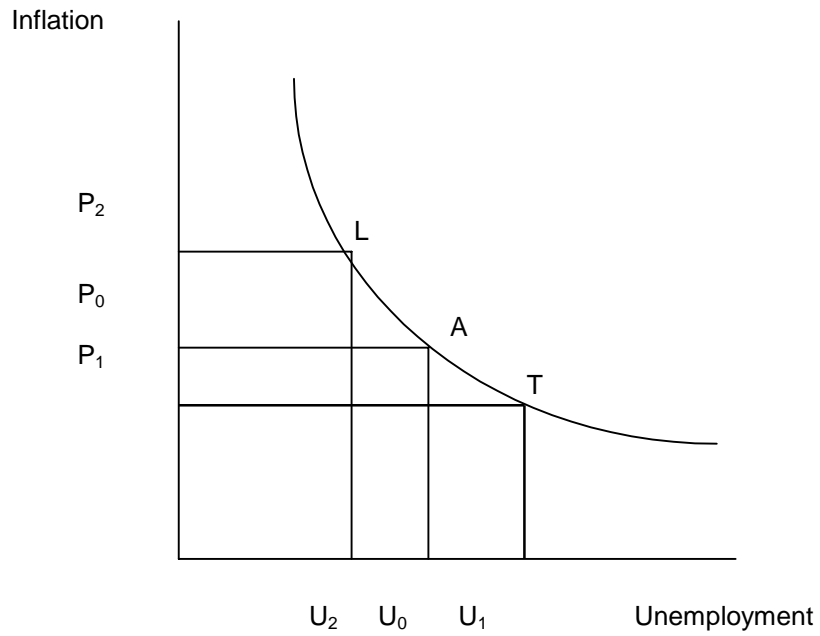


FIGURE 2: The Corporatist Phillips Curve

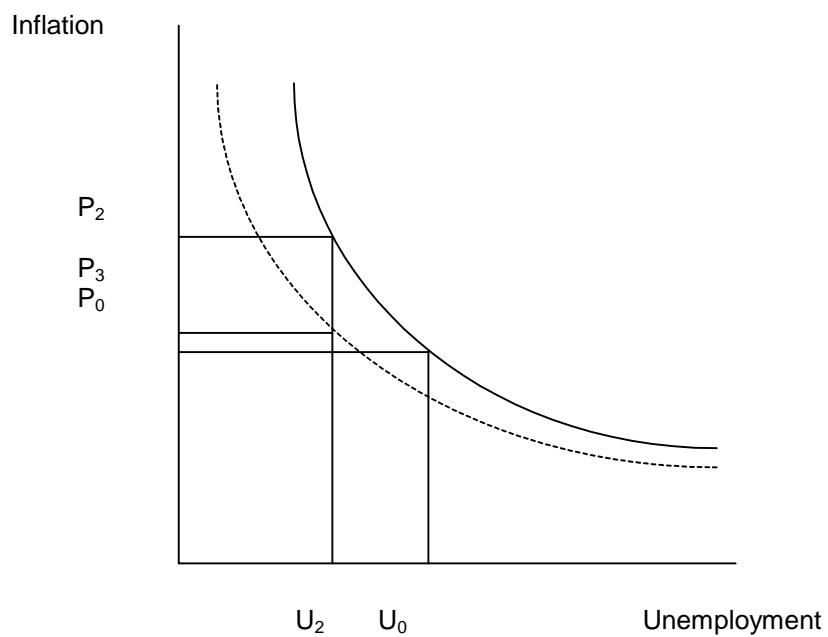
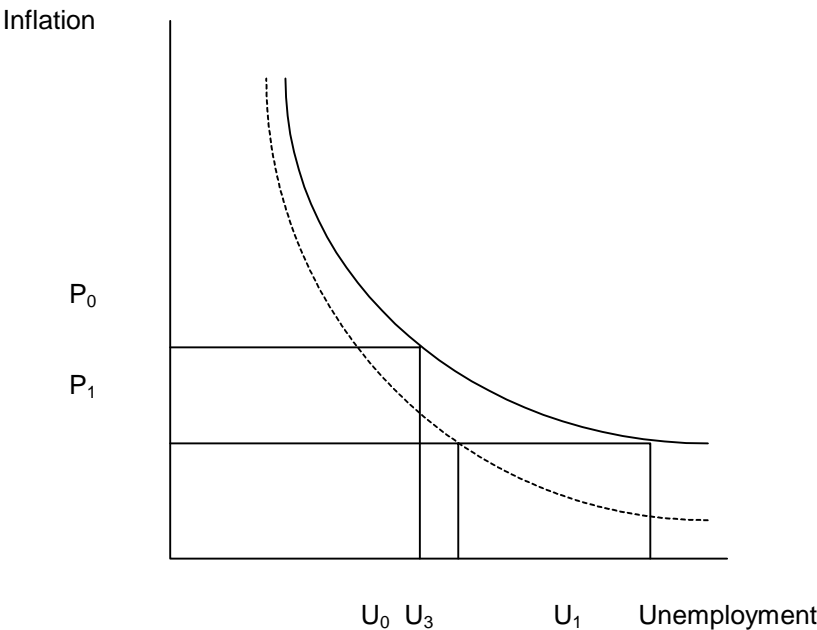


FIGURE 3: The Central Bank Independence Phillips Curve



economic growth and thus employment levels; this can be illustrated as a shift away from point A downwards and to the right on the curve to point T , which is associated with a higher unemployment level U_1 and a lower level of price inflation P_1 . A looser monetary policy (implemented through targeting a more rapid growth in the money stock and/or lower interest rates) in contrast tolerates higher levels of inflation in order to allow more rapid economic growth and thus lower unemployment; this can be illustrated as a shift away from point A upward and to the left to point L , associated with a higher inflation rate P_2 and lower unemployment rate U_2 .

The corporatist literature focuses on the capacity of encompassing wage bargaining institutions to reduce the severity of the inflation-unemployment tradeoff. In countries with corporatist wage-bargaining institutions, wage determination and thus the power to influence economy-wide nominal wage increases is highly centralized. Corporatist unions potentially have the capacity to exercise wage restraint, thereby suppressing wage inflation. This can be illustrated in a downward shift of the Phillips curve; for a given level of unemployment U_2 a lower level of inflation P_3 should now be achievable (see Figure 2). Due to the nature of the political "tradeoff" of wage restraint for full employment by corporatist unions, the downward shift of the Phillips curve will be proportionately greater at the lower unemployment end of the scale. While the earlier corporatist literature aimed at establishing a link between the degree of corporatism and macroeconomic performance, the later literature has focused on the conditions under which corporatist unions will exercise this wage restraint.

The central bank independence literature focuses on the effect of the degree of independence of the central bank from government upon the choice of monetary policy and macroeconomic performance. According to this literature, governments prefer lower levels of unemployment at the expense of higher inflation, especially before elections. Central bankers in contrast prefer lower levels of inflation. Central banks with more independence from government will thus generally pursue tighter monetary policies, i.e. try to push economies downwards and to the right on the Phillips curve. The central bank independence literature generally asserts that the establishment of "credibility" through an independent central bank will have beneficial effects on the inflation-unemployment tradeoff; under a credible monetary policy, for example, long-term investors will demand a smaller "inflation risk premium", thus supporting economic growth through lower real interest rates. This can be illustrated as a shift of the Phillips curve to the left; at inflation level P_1 a lower level of unemployment U_3 should be achievable (see Figure 3). The effects of central bank independence will be greatest at lower levels of inflation, i.e. the Phillips curve will shift to the left proportionately more at the lower end of the inflation scale.

However, this simple dichotomy between unemployment and inflation goals neglects another key policy goal of monetary policy, namely the stability of the financial system as a whole. In most industrialized countries financial regulatory powers and the role of central banks were considerably strengthened in response to severe financial crises during the Great Depression (Goodhart, Capie, and Schnadt 1994). One of the key powers delegated to central banks was to ensure the liquidity of the financial system and to adjust monetary policy in response to the threat of financial crisis in order to avoid sliding into another depression.

The probability of financial crisis can be increased by a tight monetary policy in at least two different ways through its effects on the banking system. The first danger of a tight monetary policy is through a liquidity crisis in the banking system caused by a mismatch between the maturity structure of banking assets and liabilities. Banks generally exercise a degree of maturity transformation, i.e. they use shorter-term sources of funds such as checking and savings deposits to finance longer-term investments such as equipment loans for businesses. The mass run-off of short-term deposits away from a banking system which is "locked in" to long-term investments can thus threaten the banking system with a liquidity crisis. A tight monetary policy can trigger such a run-off by making other investment vehicles such as money market securities (which are generally more responsive to interest rates than bank deposits) more attractive to investors; many financial regulatory systems included a degree of interest rate regulation on bank deposits such as interest rate ceilings which constrained banks' ability to pay near-market interest rates (thus reducing the relative attractiveness of bank deposits as investment vehicles) during high interest rate periods. The threat of a liquidity crisis increases with the degree to which the banking system performs maturity transformation.

Tight monetary policies can also increase the risk of solvency crises in the banking system. A tight monetary policy generally induces an increase in the bankruptcy rate of nonfinancial companies and thus in the default rate on bank loans and other financial obligations; a tight monetary policy can also trigger price deflation (i.e. the actual decrease in the nominal value of assets), which causes a loss in the value of bank investments. These losses must be subtracted from the bank's capital base; if the losses are great enough, the bank will become insolvent. The threat of triggering an insolvency crisis through a tight monetary policy increases with the degree to which the banking system is in a weak condition, e.g. when the "capital cushion" of financial institutions is low.⁴

⁴ Tight monetary policy can also mean a loss of interest income for banks; bank liabilities are generally shorter-term in maturity (e.g. sight and savings deposits) than their investments and thus are more sensitive to short-term fluctuations in interest rates than their income from long-term investment, their cost of funds will rise more rapidly than their interest income during periods of tight monetary policy.

Thus central banks, even independent central banks which are freed from the obligation to pursue low unemployment as a primary goal, are faced with a financial system stability constraint on their ability to pursue tight monetary policies. The severity of this constraint increases with the weakness of the underlying financial system and its susceptibility to liquidity and solvency crises.

In recognition of the problems caused by a weak financial system, most financial regulatory systems also include a number of mechanisms which control financial institutions' exposure to risk. One major mechanism is the direct suppression of "excess" competition, which was widely understood to have exacerbated the financial crisis of the 1930s by forcing banks to bid up interest rates on deposits and lower interest rates charged on loans in order to retain market share, thus reducing their earnings and weakening their capital structure. Excess competition can be suppressed through product market activity limitations on classes of financial institutions (leading to a segmentation of financial systems) or through interest rate or fee regulation. Another regulatory mechanism for minimizing the threat of financial crisis is the delegation of powers to financial system regulators to impose prudential regulations upon financial institutions; in contrast with direct controls on competition, prudential regulations are more concerned with controlling the level of risk exposure of financial institutions (e.g. through limiting the degree of maturity transformation that banks may perform) as well as for provision against the risk of insolvency through imposing standards for minimum levels of capital.

These types of regulation, however, are subject to the dynamic of regulatory arbitrage, i.e. the undermining of regulation by the flow of capital from more highly regulated to less highly regulated segments of the financial system. These flows are motivated by the short-term preferences of holders of financial assets for the lower costs and/or greater flexibility of less regulated systems. This may take place on the national level (depending upon the degree to which the national financial system is fragmented) or on the international level (depending on the degree of openness of the national to the international financial system). The degree to which regulators are constrained in their power to impose excess competition and prudential regulations increases with the threat of regulatory arbitrage.⁵

To summarize, central banks -- even independent central banks which are free from the obligation to pursue low unemployment as a policy goal -- are faced with a financial system stability constraint on tight monetary policies. The severity of this constraint depends on the degree of weakness of the financial system and its vulnerability to liquidity and solvency crises. The ability of regulators to impose regulations to prevent weakness of the financial system is

⁵ For an extended discussion of the problem of regulatory arbitrage see Reinicke (1995).

in turn dependent upon the degree of fragmentation of financial regulation and thus the strength of the dynamic of regulatory arbitrage.

2. The US Case

This section analyzes the consequences of a fragmented financial regulatory system in the US for monetary policy. Regulation of the financial system concerned with short-term financial assets (i.e. financial assets of less than one year maturity) is fragmented along two dimensions, both of which contribute to regulatory arbitrage and the increasing susceptibility of the system to crisis. The first dimension of fragmentation is between banks and "near-banks", i.e. financial intermediaries which perform many of the same functions as banks regarding the creation of short-term assets and the granting of short-term credits. The competition between banks and near-banks for short-term funds, which is based on "comparative advantages" which shift rapidly with changes in the regulatory environment and macroeconomic conditions, has resulted in increasing instability in the banks' funding base and the inability of the Fed to "fine tune" money and credit creation. The second dimension of fragmentation is between the state and federal levels of the banking system itself. Since banks have a choice between a state or national charter, membership within the federal regulatory system is voluntary. Due to the "membership problem" (the threat of exit by nationally-chartered banks to the state level), federal bank regulators have been undermined in their attempts to strengthen the financial system through prudential regulation, particularly minimum capital standards. As a result of growing dependence upon volatile short-term funds and deteriorating capital levels, the banking system has experienced liquidity and solvency crises in 1966, 1970, 1974, 1982, 1987 and 1990-92, in each case forcing the Fed to loosen monetary policy.

2.1 A Fragmented Regulatory System

Fragmented Banking Regulation and the "Membership Problem"

The issue of federal bank regulation and the degree to which membership in a national banking system is compulsory has been perhaps the most fundamental problem in US banking regulation.⁶ Up until the Civil War, the

⁶ One of the main issues of contention between the Hamiltonian and Jeffersonian factions during the founding of the US was whether there should be a national banking system. Roughly speaking, the Hamiltonians supported the development of a national state, in part in order to promote manufacture and commerce, while the Jeffersonians supported a

supporters of state's rights were strong enough to block the development of a national banking system. Since then they have been able to defend the states' prerogatives within three major reform periods motivated by serious financial crises (i.e. the Civil War, the establishment of the Federal Reserve System in 1914, and the New Deal in the 1930s); as a result membership in the national system has been voluntary and a state level banking system has co-existed with this national system (the so-called "dual" banking system). This coexistence means that banks have in effect a menu of choices between regulatory regimes. In addition to the choice between membership in a state or national system, state-chartered banks also exercise a degree of choice over which national programs they would like to participate in.

In the first major reform period, the federal government wished to create a national banking system as part of its efforts to finance the Civil War. A national regulator, the Office of the Comptroller of the Currency (OCC) was created to charter national banks and to monitor their condition through financial reports and conducting on-site examinations. Supporters of state's rights, however, were able to block compulsory membership in this national banking system, leading to the coexistence of the dual state-national banking system (Klebaner 1974).

The second major reform of the national banking system was the establishment of the Federal Reserve System ("the Fed") in 1914 through the Federal Reserve Act of 1913. Supporters of the 1913 Act cited the experience with the Banking Panic of 1907 as proof of the need for a national banking system with compulsory membership, the power to establish and enforce prudential standards and to regulate the money supply, and the means to intervene in preventing the spread of liquidity crises. States' rights advocates, however, were again able to block compulsory membership for state chartered banks and to restrict some of the central-bank like powers of the Fed. The hope of the Fed that the incentives provided by the system (primarily access to discount facilities and check-clearing facilities and the presumably better reputation of being affiliated with stricter national regulators) were not realized (D'Arista 1994).

The third major reform of the national banking system occurred during the New Deal in the wake of the 1929 stock market crash and the growing difficulties of the banking system culminating in the Banking Crisis of 1933. Supporters of the reform of the Federal Reserve System again argued that mandatory membership was necessary in order to prevent the repeat of such a crisis; most of the insolvent banks were state-chartered banks and thus were not subject to the scrutiny of federal regulators and did not have access to the Fed's discount window to help them deal with their liquidity crises. States' rights advocates, however, were again able to block these efforts; the Banking Acts of

decentralized state as more appropriate to an economy dominated by small-scale agriculture.

1933 and 1935, the major pieces of legislation reforming the national banking system, again ratified the principle of voluntary membership for state chartered banks in the Federal Reserve System and in the Federal Deposit Insurance Corporation (FDIC), the newly-established agency responsible for administering the federal deposit insurance scheme.

With the passage of the New Deal reform legislation, banks had at least four choices available to them regarding the regulatory regime they belonged to: (1) they could hold a charter at the state level and participate in none of the federal programs, in which case they were subject to the regulatory authority of the state legislature and state banking commissioner; (2) they could hold a state charter but elect to participate in the federal deposit insurance program; in this case they were subject to regulation by both the state and by the Federal Deposit Insurance Corporation (FDIC); (3) they could hold a state charter but participate in both the federal deposit insurance program and the Federal Reserve System; in this case they would be subject to regulation by state regulators and, at the federal level, by both the FDIC and the Federal Reserve Board; or (4) they could hold a national charter, which would require them to participate in both the federal deposit insurance program and the Federal Reserve System; in this case they would be subject to regulation at the federal level by the Office of the Comptroller of the Currency (OCC), the FDIC and the Federal Reserve Board (Reinicke 1995).

Federal level regulators attempted to reduce the confusion of this fragmented system by dividing responsibilities among themselves and designating a "lead regulator" for each of the categories of banks; thus the FDIC, the Fed, and the OCC have primary responsibility for banks in categories (2), (3), and (4), respectively; in addition, the Fed is the lead regulator of bank holding companies. However, this didn't completely solve problems in which there were differences of opinion among the federal regulators. Also, federal regulators have little means other than the power of persuasion to try to influence state regulators regarding regulatory standards under their jurisdiction. In effect banks have an "exit option" to the state level if they feel that the costs of belonging to the national systems offset the benefits of membership. This exit option created a "membership problem" in which the threat of exit by banks constrained national regulatory decisions throughout the postwar period on issues like minimum capital requirements, minimum reserve levels, and qualitative standards for the minimum quality of loans and risk diversification:⁷

"Almost 60% of all banking organizations have two or more federal regulators and close to half of all bank and thrift assets are held by banking organizations with three or four regulators. The existence of multiple regulatory agencies in the US financial

⁷ These costs included deposit insurance fees for the FDIC, the opportunity cost of interest income lost on interest-free minimum reserves held in the Federal Reserve System, and the opportunity costs caused by constraints on lending through minimum capital requirements.

system creates institutional overlap among the regulators at the federal level, leading to the emergence of different regulatory regimes. This forces regulators to compete with each other in a market for regulation, reversing the traditional role of public policy" (Reinicke 1994: 10).

Fragmented Regulation and Competition for Short-Term Funds

A second dimension of fragmentation which has consequences for the susceptibility of the banking system to crisis is the existence of segments of the financial system which compete with banks to attract short-term funds and to make short- and medium-term investments. These competing channels constitute a source of alternative funds which banks can aggressively bid away in order to finance rapidly rising demands for credits; however, these funds can also rapidly evaporate in response to banking crisis or more favorable return opportunities elsewhere. The ease with which these funds may be shifted has also created problems for the control of the credit creation process by the Fed.

One of the major alternative channels for short-term funds is the thrift industry.⁸ The primary source of funding for the thrift industry, whose main function is to provide residential mortgages and consumer credit, is savings deposits. While savings deposits in the earliest thrift institutions were "dedicated", (i.e. accumulated according to a fixed plan, for a specific purpose such as the acquisition of a mortgage, and subject to heavy penalties in the case of premature withdrawal), the growth of thrift institutions was modest until they started accepting "general purpose" savings deposits (i.e. accumulated "at will" by the depositor, not tied to a specific purpose, and withdrawable with little or no delay or penalty). Thus the boundary between general-purpose savings deposits and demand deposits (the main funding source for banks at the beginning of the postwar period) is narrow; the main difference was that demand deposits carried no interest but one could not write checks against savings deposits. The main barrier to shifting these funds is the inconvenience of going to a thrift institution, withdrawing the funds, and then going to a bank and redepositing the funds there or vice versa. As interest rates increased during the postwar period and the "opportunity cost" of leaving funds in bank demand deposit accounts increased, the frequency of this shifting behavior by households (the main holders of savings deposits) increased.⁹

⁸ The thrift industry includes savings and loans (S&Ls), credit unions, and mutual savings banks.

⁹ Commercial banks were also allowed to take savings accounts; however, the interest rates offered on commercial bank savings deposits were generally lower than those on thrift savings deposits, before the mid-1960s because of the lack of direct regulation of these rates, and from the mid-1960s on due to regulatory design.

A second major alternative channel for short-term funds is the open money market.¹⁰ One of the major types of financial assets traded on the open money market are short-term government securities (Treasury bills). The US government issued these securities in large amounts to finance the military effort during World War II and the growing budget deficits after 1960. These securities are issued in a variety of maturities, from three months to thirty years, in part in order to give the Fed some leverage to influence the spread between short-term and long-term interest rates. While typically carrying somewhat lower rates of return than other money market securities, Treasury securities are both highly liquid (due to the sheer volume of the market) and the safest form of investment available (due to the backing of the government) which make them particularly in demand during crisis periods.

Another major form of open money market asset is commercial paper issued directly by large and safe ("blue-chip") corporations. Commercial paper is largely unregulated (corporate law in the US, which is the main constraint upon nonfinancial corporate financial activities, falls within the states' jurisdiction) and thus free of various regulatory costs such as deposit insurance fees and minimum reserve requirements. Blue-chip corporations have increased their issuance of commercial paper in order to gain the advantage of slightly smaller interest costs relative to short-term bank loans. (Gart 1989).

The initial major investors in open money market securities were large corporations, who wished to earn greater interest rates than available on demand or short-term time deposits at banks. These securities generally had very large denominations and were thus accessible only by institutional investors and the wealthiest families. However, the development of money market funds, which exercised "denomination transformation" by pooling together funds from a large number of smaller investors to buy a portfolio of large-denomination short-term securities, effectively gave a large number of households access to this alternative investment vehicle for liquid funds. The most aggressive developers of money market funds were brokers and insurance companies eager to gain market share in the highly liquid funds area.

The growth of this open money market has created an expanding source of funding for finance companies, another type of financial intermediary competing with banks. Finance companies, which have grown to be a major source of medium-term business and consumer credit, are regulated at the state level. Finance companies, which issue mainly short-term commercial paper to finance loans typically with two- to three-year maturities, fall under state regulation such as state usury laws. Finance companies are direct competitors with banks for attracting short-term funds and making loans; however, they are not subject to the direct supervision of federal bank

¹⁰ See Stigum (1990) for an exhaustive analysis of the rise and characteristics of US money markets.

regulators or the prudential standards of the banking system (Fabozzi, Modigliani, and Ferri 1994).

Finally, commercial banks have both contributed themselves to the growth of and increased their dependence upon the open money market through the development of a number of new short-term financing mechanisms in the postwar period. The first such mechanism, the Certificate of Deposit (CD), was developed in 1961. These large (i.e. with denominations of \$100,000 or more) CDs are formally considered time deposits due to fixed maturity (typically thirty, ninety, or one hundred and eighty days) but are also negotiable. They thus offer depositors liquidity comparable to demand deposits but at the same time allow them to receive interest rates comparable to open money market securities such as Treasury bills (under Regulation Q commercial banks were not allowed to pay interest upon demand deposits). CDs are thus an open money market instrument. The power to issue CDs expanded the banks' access to short-term funds, including the Euro-dollar markets:

"For the large commercial banks the continuing restrictions on their ability to bid for deposits were becoming onerous. The banks were having difficulty keeping up with their major clients. As these clients evolved into national and international concerns with greatly expanded credit requirements, they had to turn to an ever widening circle of banking sources because the growth of their 'lead' banks remained essentially dependent upon a narrow local deposit market. It was in response to such pressures that in early 1962 the negotiable certificate of deposit (CD) burst on the scene, spearheading a rapid and total transformation of financial practice...The new instrument...suddenly enabled well-know banks to bid for deposits all over the world. At a price, funds would always be available" (Wojnilower 1980: 284-5).

The authorization of CDs removed a great constraint on the funding side of a serious constraint on the funding side of commercial banks. CDs would become the main instrument of "management liability", i.e. the active purchase of funds to cover investments made. Previous to the authorization of CDs investment policy was driven by available funds; banks would ration out available funds to the highest quality customers. With the introduction of CDs and other forms of managed liabilities (e.g. commercial paper issued by bank holding companies and funds made available through repurchase agreements for securities), bank policy could be driven by the investment side decisions; once the level of loans was determined, the bank could go out and purchase the funds needed to cover these loans.

A second mechanism for giving banks expanded access to the open money market was through the issue of commercial paper. While banks themselves cannot directly issue this form of security, bank holding companies can issue commercial paper and then relend the proceeds to the bank or banks that it owned. The issuance of bank holding company commercial paper expanded greatly in the late 1960s as a means of avoiding Regulation Q ceilings on deposit interest rates. While the need for commercial paper for

large commercial banks has decreased due to the deregulation of CD interest rates, commercial paper remains an attractive vehicle for smaller bank subsidiaries of multi-bank holding companies.

A third mechanism giving banks expanded access to money markets is through the use of securities repurchase agreements ("Repos"). Repos allow banks to borrow money against the collateral of securities by "selling" these securities with the agreement to purchase these back at a specified time for a specified amount.

A fourth mechanism is the expansion of inter-bank liabilities, particularly to foreign banks. In addition to increasing use of domestic money markets, banks also expanded their access to the Eurodollar markets through borrowing from foreign banks. Since the 1970s, with the exception of the high interest rate period of the early 1980s, US bank liabilities to foreign banks have greatly expanded.

Thus, the market for short-term financial assets in the US is characterized by a great degree of "openness" in terms of the securitization of assets and the number of players competing for these funds based on "comparative advantage"; banks are only one of these players and face a number of disadvantages due to regulatory costs such as deposit insurance and minimum reserve requirements.

2.2 Consequences of Fragmented Regulation in the US

Three of the direct consequences of fragmented regulation in the US have been constraints upon the development of effective minimum capital standards, increasing volatility in the funding base of banks, and difficulties in the implementation of monetary policy due to a "decoupling" of the clear relationship between bank reserves, bank credit and the money supply.

Weakness of Minimum Capital Standards

The problem of regulatory fragmentation between the state and federal level and among federal regulators has been a major constraint upon the development of minimum capital standards for banks. Since national banking law until the late 1980s only defined a minimum absolute level of required capital (rather than capital ratios), the individual federal regulatory authorities were dependent upon informal pressure to influence banks to maintain adequate capital levels:

"...none of the regulators had formally stated minimum requirements for the ratio of total capital to total assets. Instead, each regulator typically compared capital ratios

for banks grouped together by common characteristics, including asset size, and attempted to persuade those banks that had relatively low capital ratios to raise them" (Gilbert, Stone, and Trebing 1985).

In the 1960s, the federal bank regulators developed substantially different conceptions of "adequate capital." The OCC relied on a subjective evaluation of national banks based on "the quality of management; the liquidity of assets; the history of earnings (including the proportion retained); the quality and character of ownership; the burden of meeting occupancy expenses; the potential volatility of deposits; the quality of operating procedures; and the bank's ability to meet the financial needs of its trade area" (Rose and Fraser 1988: 393). The Federal Reserve System developed a Form for Analyzing Bank Capital (FABC), which classified the asset structure of the bank into six categories of credit and interest rate risk.¹¹ The FDIC, which as a deposit insurer was the most risk-adverse, in practice was the strictest regulator. As a result, different categories of banks under the supervision of federal regulators (banks chartered at the national level, state banks participating in federal deposit insurance, and state banks participating in federal deposit insurance and the Federal Reserve System) were subject to different conceptions of adequate capital and different levels of vulnerability to regulators' pressure if they fell below these standards (Reinicke 1995).

In additional barrier to the development of clear capital standards was the divergence of state-level regulation from (the already diffuse) federal standards. Many states had considerably looser capital standards or lax enforcement, creating an attractive alternative for banks that wished to rapidly expand their loan base without issuing additional relatively expensive capital. Studies commissioned in the 1960s and 1970s comparing the costs and benefits of membership in state versus national level regulatory regimes indicated that the costs of national regulation were considerably greater than the benefits in many states, which in addition to less rigorous capital standards often had lower minimum reserve requirements, cheaper deposit insurance programs, and laxer risk diversification standards. The possibility of "exit" to state-level systems to avoid the costs of federal regulation became known as the "membership problem" for the Federal Reserve System (Gilbert, Stone, and Trebing 1985).

As a result of these pressures, the capital ratios of banks fell precipitously over the postwar period; between 1962 and the early 1980s, the capital ratio for the banking system overall had fallen from eight percent to under six percent relative to total banking assets (Boyd and Gertler 1993). Ironically, although the

¹¹ The six categories were: (1) primary reserves (cash assets and federal funds sold), (2) secondary reserves (commercial paper, banker's acceptances, and securities maturing within one year); (3) minimum-risk assets (securities maturing within one to five years); (4) intermediate assets (securities maturing in from five to ten years); (5) portfolio assets (loans and long-term securities); and (6) fixed, classified, and other assets).

danger of exit was least among the largest banks due to their reliance on the Fed's discount window as insurance against liquidity crises, their overall capital ratios were the lowest when comparing commercial banks by broad group sizes; the ratios of the so-called money center banks, the nine largest banks, had declined to four percent by the early 1980s.¹²

In response to the concern about a growing number of bank insolvencies due to the further weakening of bank capital through an increasing number of nonperforming loans due to the twin recessions in the early 1980s, the three federal bank regulators attempted to define common standards to use for banks subject to national regulation. The first attempt, in 1981, involved an agreement among federal regulators to require a capital ratio of six percent for smaller banks and five percent for other banks. Since the money center banks were struggling with so-called "less developed country" (LDC) loans and had no chance of meeting these standards, federal regulators exempted the seventeen largest banks from these requirements (Greider 1987; Gilbert, Stone, and Trebing 1985). The capital levels of a number of these larger banks continued to deteriorate during the 1980s; the two most aggressive expanders, Citibank and Bank of America, in all likelihood became technically insolvent but were allowed to continue operations by the regulators due to the fear of the panic that would be set off due to the bankruptcy of the largest two US banks (Miller 1993).¹³

Only after the experience with mass default on LDC loans and the numerous bank insolvencies in the second half of the 1980s was there sufficient political pressure to impose universal capital ratios on commercial banks. A commitment to clear minimum capital ratios for all banks was made for the first time in the 1988 Basle Agreement.¹⁴ These capital standards have been the source of considerable resistance from commercial banks, who claim that they face a competitive disadvantage relative to other financial intermediaries and blame a loss of market share and the "credit crunch" of 1990-92 upon the new capital requirements (Boyd and Gertler 1993) (Berger and Udell 1994).

Increasing Levels of Liquidity Risk

A second consequence of fragmented regulation was that the funding base of commercial banks has become increasingly volatile at the same time that banks have increased their involvement in longer-term lending. These two

¹² To give a flavor of the level of risk that these figures represented, the minimum safe capital-to-assets ratio agreed to by the G-7 countries in the Basle agreement was eight percent.

¹³ A similar dynamic also existed among the S&Ls (Fabritius and Borges 1989).

¹⁴ The Basle Accord was reached under the auspices of the Bank of International Settlements by the Basle Committee, which includes representatives of the central banks and bank regulators from the G-10 countries plus Luxemburg and Belgium.

divergent trends (increasing dependence on short-term, volatile funds on the liability side and increasing long-term loan commitments on the asset side) have exposed commercial banks to increasing levels of liquidity risk over the postwar period.

The mix of commercial bank funding sources has changed considerably since the end of World War II (see Table 2). In 1946, seventy one percent of commercial bank liabilities were checking deposits; by 1994 this proportion had decreased to nineteen percent. Small time and savings deposits (primarily deposited by households) increased somewhat, from 25% to 34% in the same time period. The most substantial increase in importance was among money market funds as a whole; these increased from four percent of commercial bank liabilities in 1946 to 33% in 1994 (see Chart 1). Large banks are relatively more dependent upon these funding sources; money market liabilities currently account for over two thirds of the liabilities of the large money center banks (McCauley and Seth 1992).

Money market funding sources are considerably more volatile than more traditional forms of commercial bank financing; the relative mix of different kinds of money market liabilities have fluctuated considerably since the 1960s. Using one measure of volatility, the coefficient of variation in the quarterly change in the amount of these liabilities outstanding between 1980 and 1994, small time and savings deposits and checking deposits show the first and third lowest level of volatility overall (see Table 3). Corporate bonds, which are also a new funding source for banks but account for only one tenth the level of money market liabilities, are the second most stable source of funds. All of the money market liabilities are considerably more volatile than the traditional sources of bank funding.

At the same time that commercial banks have become more dependent on more volatile sources of funds, they have also expanded their involvement in industrial finance, i.e. longer-term loans to industry for fixed capital, thus competing to some degree with the bond markets for industrial finance. In 1939, only nine percent of total commercial bank lending had an original maturity of one year or more. About one quarter of commercial bank lending to business (i.e. commercial and industrial loans) was long-term. The sixteen largest banks (ten of them in New York) accounted for two thirds of the term loans (Moore 1959: 213). By the 1990s, however, eighty percent of commercial bank loans to manufacturing were one year or greater in maturity (see chart 3).¹⁵

¹⁵ The expansion of long-term bank lending took place for a number of reasons. First of all, the New Deal regulatory system placed increasing regulatory requirements on the traditional vehicle for long-term debt finance, corporate bonds. Corporations became interested in other, less burdensome alternatives for long-term debt finance. Secondly, SMEs without access to the public or private placement bond markets became more interested in long-term debt finance because higher labor costs and a narrowing of the wage gap relative to

Table 2:
US Commercial Bank Liabilities, 1946 and 1994

Type of Liability	1946	1994
Checkable Deposits	70.7%	18.8%
Small time and savings deposits	24.6%	34.2%
Corporate bonds	0.0%	3.5%
Money Market Liabilities	3.9%	32.5%
Large time deposits (CDs)	2.7%	8.3%
Fed funds & security RPs	0.0%	9.7%
Net Interbank Claims	1.2%	4.8%
Commercial paper	0.2%	1.4%
Total	100.0%	100.0%

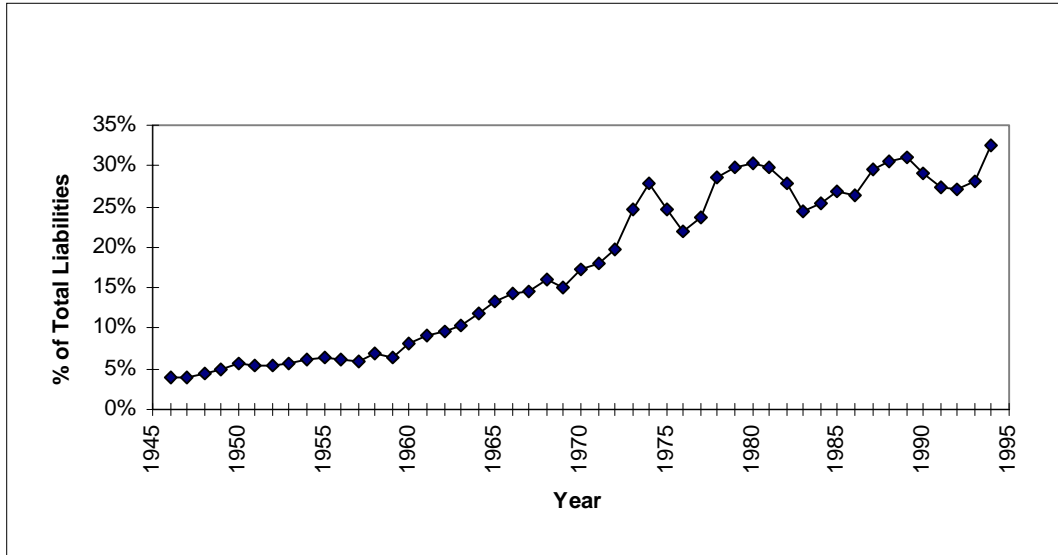
Source: Own calculations from Federal Reserve Board Flow of Funds Accounts

Table 3:
Volatility of US Commercial Bank Liabilities
Quarterly Changes in Amount Outstanding, 1980-94

Type of Liability	Coefficient of Variation
Checkable Deposits	1.7342
Small time and savings deposits	0.9061
Corporate bonds	1.3644
Money Market Liabilities	
Large time deposits (CDs)	9.4686
Fed funds & security RPs	2.1204
Net Interbank Claims	6.6351
Commercial paper	30.7003

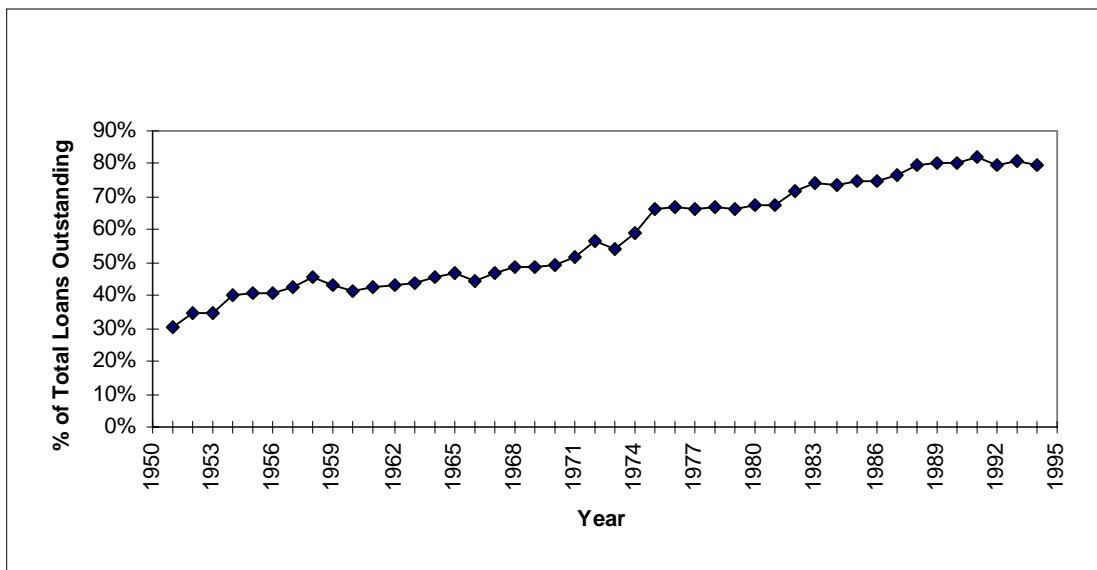
Source: Own calculations from Federal Reserve Board Flow of Funds Accounts

Chart 1:
US Commercial Bank Money Market Liabilities
(as a % of Total Liabilities)



Source: Own calculations from Federal Reserve Board Flow of Funds Accounts, 1946-1994. Total liabilities excludes taxes payable and miscellaneous liabilities.

Chart 3:
Share of Longer-Term Loans in Total Bank Loans
Outstanding to US Manufacturing



Source: Own calculations from US Federal Trade Commission, Quarterly Financial Reports for Manufacturing

These two trends -- increasing commitment to longer-term loans on the asset side and increasing dependence upon volatile money markets on the liability side -- have exposed commercial banks to an increasing level of liquidity risk over the postwar period.

Problems with Monetary Management

A third major consequence of regulatory fragmentation is the impairing of the effectiveness of the Fed's monetary policy. The Fed's use of one of its most effective monetary tools, the adjustment of minimum reserve levels, has been directly constrained by the "membership problem" discussed above. As one observer of the Federal Reserve System succinctly put it:

"frequent changes [in reserve requirements] constitute an unnecessary irritant. All member banks (or all in one reserve group) are directly affected by this method, and the hand of the Federal Reserve is clearly evident. Rather than being annoyed by frequent changes, banks much prefer some stability of the rules in administering their liquidity positions. This aspect of the problem assumes larger importance in view of the fact that state-chartered banks, who represent nearly one-half of commercial-bank resources, are not compelled by law to be members of the Federal Reserve System. Frequent changes could become such a nuisance as to reduce membership by both withdrawals and reductions in applications" (Woodworth 1965: 266).

While the Fed can also indirectly influence the level of reserves outstanding through its open market operations (i.e. purchase and sale of federal securities to influence the amount of bank reserves outstanding), the effectiveness of this tool has been constrained by the flow of funds to other segments of the financial system during periods of monetary tightening; since these near-banks have lower or no level of reserve requirements, this flow means that the financial system as a whole can maintain (or, depending on the ratios, even increase) the amount of credit outstanding despite a decrease in bank reserves. When banks cut back on their creation of new credit, for example, nonfinancial companies can turn to finance corporations (which have no reserve requirements) for an alternative source of funding. Larger corporations can also increase their issuance of commercial paper during these periods of constrained bank credit.

Through the blurring of distinctions between demand and savings deposits (by allowing some interest to be paid on the first and limited checking on the second), financial innovation has also allowed the banking sector itself to mitigate the effects of restricting the growth of reserves. During high interest rate periods the interest rate gap between demand and savings deposits rises. As a result funds flow from demand to savings deposits. Since the latter carry lower reserve requirements, the same amount of total deposits (demand plus savings) can support a higher level of loans.

One consequence of the ease with which funds may be shifted is that the financial system has often been unresponsive in the short or even medium run to the tightening of monetary policy. Credit creation by the financial system as a whole has continued to expand rapidly in a number of instances of considerable tightening, particularly in the late 1970s. Slowdowns in credit creation have thus tended to take the form of sharp breaks in credit availability, often due to panics set off by concern about the stability of the financial system, rather than gradual reductions in new credit creation (Wolfson 1994).

Another consequence of the ease of shifting is that the meaning of changes in monetary aggregates themselves has become unclear. The traditional division between M1 (the most restrictive definition of money, i.e. currency, demand deposits, and traveler's checks) as the transactions demand for money and other aggregates such as M2 and M3 (transactions demand plus reserves at various levels of liquidity) has progressively broken down through the innovations mentioned above. Thus changes in these aggregates have become both unclear indicators of the state of the economy and unreliable operating targets for monetary policy. To mention one concrete example, the "monetarist experiment" of 1979-82 was based on the target of growth in M1. In early 1981, after one year of recession, there was a spurt in the growth of M1 despite a worsening in other indicators. The meaning of this spurt in M1 was interpreted differently by different members of the Federal Reserve Board and Open Market Committee, with some urging that M1 be abandoned as an unreliable target. The majority prevailed in sticking with M1 as a target and ignoring other financial and economic indicators; monetary policy was tightened further. As it turned out, M1 had in fact experienced a temporary spurt and the other indicators were correct in showing that the economy was not heading out of recession. What had been a moderate recession throughout 1980 and the first part of 1981 was turned into the deep recession of late 1981/early 1982, the worst postwar recession in the US with significant repercussions for the stability of the financial system and the breaking of the pattern bargaining system of collective bargaining.

2.3 Banking System Crises as a Constraint on Monetary Policy

The combination of the three problems discussed above -- the weakening of bank capital, increasing exposure of banks to liquidity risk, and the inefficiency of monetary policy -- have resulted in liquidity and solvency crises in the banking system in 1966, 1970, 1974, 1982, 1987, and 1990-92. While the determinants of monetary policy are complex, each episode clearly caused the Fed to retreat from its pursuit of monetary tightening. During the full-employment period of the second half of the 1960s and 1970s, these crises acted as a major constraint on the ability of monetary policy to halt the upward ratcheting of inflation and interest rates.

The 1966 "Credit Crunch"

The mid-1930s until the early 1960s was a period of unusual stability in inflation and interest rates in the US. With the exception of periods of inflation in 1945/46 related to the release of pent-up consumer demand during World War II and in 1950/51 associated with mobilization for the Korean war, annual price inflation was negligible; the average annual increase in the consumer price index between 1952 and 1962 was 1.3%. Short-term interest rates stayed below 4% level.¹⁶

While the increase in 1963 was in part caused by expansionary fiscal policy, government deficits were quite modest compared with today's standards. US involvement in the Vietnam War was still quite limited and the first legislation authorizing the new social programs of the Great Society was just being enacted. One account of this period claims that the extent of the boom despite limited stimulus was the "easy credit" policy of banks wishing to expand aggressively. Until more extensive war mobilization and implementation of social programs in 1965, the business expansion was largely funded by an expansion of bank loans, in large part refinanced through the new mechanism of large CDs (Wolfson 1994).

Since levels of inflation over 2% were still a cause of concern in the financial community in the early 1960s, the increase in inflation by an annual rate of 2.8% in the third quarter of 1963 triggered a tightening of monetary policy by the Fed; the discount rate, which had remained at 3% since 1960, was increased to 3.5%. While the inflation rate rapidly fell to more moderate levels, in the third quarter of 1964 it increased at an annual rate of 2.1%, triggering a further tightening of monetary policy and an increase in the discount rate to 4% in November 1964. After a period of easing, inflation increased by 2.8% and 2.1% in the second and third quarters 1965, triggering a further increase in the discount rate to 4.5%.

Despite this high interest rate, banks continued to expand their new business loans at a brisk pace. Although the annual growth rate in bank reserves had slowed to 0.9 percent in the second quarter of 1966, all bank credit increased at a 9.1 percent annual rate and bank credit to businesses (i.e. commercial and industrial loans) increased at an annual rate of 20.5 percent. Inflation increased by 3.4% in the first quarter and 4% in the second quarter of 1966.

Commercial banks were able to expand loans despite the slowdown in reserve growth in part through the issuance of Certificates of Deposit; the rise

¹⁶ Short-term interest rates in this section refers to the rates paid on 3-month US treasury bills. Inflation refers to price increases as measured by the Consumer Price Index (CPI). The discount rate refers to the rate offered by the New York Federal Reserve Bank to member banks. Figures are based upon OECD Historical Statistics.

in interest rates increased the attractiveness of interest-bearing time deposits relative to non-interest paying demand deposits and the CDs offered almost as high degree of liquidity as demand deposits. The shift of funds to CDs allowed the banks to avoid the reserve constraint, since CDs carried lower reserve requirements, thus allowing a greater volume of loans to be carried by the same level of reserves. It also allowed large commercial banks to a certain extent to attract funds away from smaller banks and thrift institutions (who did not have the capacity to issue large CDs), thus reallocating funds from housing (the major use of credit by the thrifts and smaller community banks) towards business credit (Wojnilower 1980) (Wolfson 1994).¹⁷

With the failure of more conventional monetary tools to control inflation and the growth of business credit, the Fed attempted to limit the funds available to commercial banks by lowering interest rate ceilings on CDs. Under Regulation Q of the Federal Reserve Act, the Fed was allowed to set ceilings on all time and savings deposits. At the end of July 1966, the Fed lowered this ceiling from 5.5 to 5 percent on "multiple-maturity" (i.e. renewable upon maturity) CDs with maturities of more than 90 days and to 4 percent on multiple maturity CDs with maturities of less than 90 days; the ceiling on single maturity CDs remained at 5.5 per cent (Treasury of the United States 1979).

At the same time, short-term interest rates continued to increase above the highest (5.5 percent) interest rate ceiling imposed on CDs. The result was a flow of funds out of large CDs into other short-term securities such as Treasury Bills which were not constrained by Regulation Q interest rate ceilings. In 1966, CDs already accounted for almost 10 percent of commercial banking liabilities; larger banks were disproportionately affected due to their greater dependence on CD funding (McCauley and Seth 1992). The loss of these funds thus forced banks to not only curtail loans but to also liquidate outstanding long-term loans:

"The outcome was the notorious 'credit crunch' of August-September 1966...Banks that relied almost entirely on liability management faced the apparent inevitability of massive distress sales of long-term assets into an already paralyzed market place. Lending to all but the most established and necessitous customers was halted abruptly" (Wojnilower 1980: 287).

In response to the credit crunch and sharp slowdown in business activity, the Fed loosened monetary policy and liberalize access to the discount window in order to ease the liquidity crisis of banks; it also effectively signaled that interest rate ceilings on CDs would be increased when the danger of a liquidity crisis arose. Banks became less cautious about their use of managed liabilities and a rapid increase in bank lending soon restarted the economic boom.

¹⁷ "The relation of the large banks to the Federal Reserve was altered in that the large banks now perceived CD borrowing rather than discount-window borrowing as their credit recourse of last resort. Unless the authorities were willing to apply the crude club of rate ceilings, CD borrowing was much more difficult to discipline than the discount window" (Wojnilower 1980: 286).

Inflation remained at a rate of about 5% since little had been done to deal with the underlying structural problems of rapid expansion.

The 1970 Penn Central Crisis

The years leading up to the Penn Central crisis of 1970 also illustrate the difficulties in the ability of traditional monetary policy tools to control inflation. A major tightening of monetary policy had only limited effectiveness in slowing down business activity and inflation. In 1970, however, new lending by banks was sharply curtailed by panic in the wake of the collapse of the Penn Central Transportation Company (a major issuer of commercial paper) and the resulting flight of investors from the commercial paper market and the banks providing guarantees to the issuers in this market. In order to restore calm on the financial markets, the Fed was forced to ease monetary policy.

The period since the 1966 credit slowdown was characterized by a largely futile attempt by the Fed to slow down credit creation and inflation through traditional monetary tools. Thus the Fed increased the discount rate four times from its low point of 4 percent after the 1966 credit slowdown: to 4.5% in November 1967, to 5 percent in March 1968, to 5.5 percent in April 1968 and to 6 percent in April 1969. However, with the exception of a brief dip in the first quarter of 1967 in the wake of the 1966 credit crunch, the inflation rate stayed above the psychologically important 2% level. In the second quarter of 1969 the annual increase in the CPI reached a postwar high of 7.2%.

The failure of traditional monetary policy tools to control rapidly increasing business loans and rising inflation led the Fed to let Regulation Q ceilings take effect to constrict bank access to short-term funds. In 1969 short-term interest rates remained above 6 percent (reaching a high of 8.1% in December), thus exceeding the Regulation Q ceilings of 5.75% on 60-89 day CDs, 6% on 90-179 day CDs for the entire year and the ceiling of 6.25% on 180 day and more CDs for most of the year. The amount of large time deposits outstanding declined one third from the end of 1969 to the end of 1970.

Despite this large decrease in funding through CDs, commercial banks continued to increase their business lending. The 1966 credit crunch had been a major irritant to the larger commercial banks due to their forced sales of long-term assets and disruption of relationships with customers. As a result, the large commercial banks sought alternative sources of funding which allowed a circumvention of controls such as Regulation Q which had triggered by a cutoff in access to funds when short-term interest rates increased above interest rate ceilings on CDs. In the late 1960s these included the issuance of commercial paper through holding companies and funds raised on the Eurodollar market.

The credit crunch of 1970 was triggered by the bankruptcy of the Penn Central Transportation Company. Penn Central, one of the largest corporations

in the US, used the commercial paper market extensively to fulfill its short-term credit needs. The commercial paper market was essentially unregulated and "blue-chip" companies preferred to use it over short-term bank credits because of lower interest rates; these lower interest rates were due to the freedom from deposit insurance and minimum reserve requirements (both of these, especially the latter which are held as non-interest bearing balances with the Federal Reserve System, increased the relative cost of bank loans). However, to reassure investors, commercial paper is generally backed up by bank lines of credit; the bank promises to take over the obligation if the issuing company defaults on its commercial paper.

The Penn Central collapse triggered a crisis of confidence in the commercial paper market due to the fear that a bankruptcy wave would result; rumors about an impending bankruptcy of Chrysler abounded. This crisis of confidence spread to the banking sector, since banks were backing up the commercial paper market. A bankruptcy wave would mean that banks would suddenly face a liquidity crisis unless they could raise the funds in the CD market to reimburse investors in commercial paper. Although the Fed moved quickly to avert fears of a liquidity crisis, a serious credit crunch ensued:

"Heroic emergency measures were taken by the Federal Reserve, and were fortunately successful, to assure the refinancing by banks of billions of commercial paper borrowings by companies large (notably Chrysler) and small....even though financial disaster was averted, shock at the narrowness of the escape was profound. It prompted an instant toughening of credit standards by lenders and a reduction of perceived borrowing capacity by business firms. The short-range impact lasted until it was swept away by the commodity boom of 1973-74" (Wojnilower 1980: 293).

In addition to liberalizing access to its discount window, the Fed also rapidly reduced its discount rate from 6 percent to 4.75 percent. While the rate of inflation was brought down from the 1969/70 highs, it would stay at the relatively high level of 3.6% during 1971 and 1972.

The 1974 Franklin National Bank Crisis

In the early 1970s, the upward spiral of expanding bank loans, money stock and inflation continued. In addition to the domestic affects of inflation, the weakness of the dollar and the outflow of capital out of the US became a major concern. An abortive attempt to control domestic inflation through Nixon's 1971-73 Stability Program (which included various restrictions on wages and prices) was abandoned in 1973 because of difficulties with implementation. The main responsibility of fighting inflation, which had been exacerbated by a four-fold increase in oil prices by OPEC, once again reverted to the Fed.

At the beginning of 1973 inflation once again began to increase rapidly, triggering a tightening of monetary policy by the Fed; the discount rate was

increased to 5.5 percent in the first quarter, 6.5 percent in the second quarter, and 7.5 percent in the third quarter of 1973 and once again to 8 percent in the second quarter of 1974. Despite this drastic tightening, the CPI increased by 8.1% in 1973 and 11.7% in 1974. Banks relied especially on Eurodollar borrowings during this period to avoid the constraint of tightened monetary policy.

While the severe monetary policy began to slow economic activity in 1974, the Fed was forced to loosen again by the collapse of the Franklin National Bank, the nation's twentieth largest bank and a heavy user of volatile short-term funds. In contrast with the 1970 Penn Central crisis, which called into question the banks' ability to back up commercial paper issues, the Franklin National Bank collapse triggered a direct crisis of confidence in bank CDs and thus a more drastic curtailment of funds available to finance new loans:

"As in the case of Penn Central, the direct impact was quickly eased by a Federal Reserve bailout. But where the Penn Central default for a time paralyzed the commercial paper market, the Franklin near-default rendered it difficult if not impossible for all but ten or fewer of the nation's largest banks to count on being able to roll over their maturing CDs. Thus for most banks the making of new loan commitments based on prospective CD issuance was out of the question" (Wojnilower 1980: 298).

The Fed rapidly liberalized access to the discount window and reduced the discount rate from 8 to 6 percent. The crisis forced a curtailment of new bank lending and a slowdown in business activity. While inflation came down from its double-digit levels of 1974, it would remain at 6% during 1975 and 1976.

The "Monetarist Experiment" (1980-82) and the Penn Square Failure

Despite efforts to control inflation through tightening monetary policy in the late 1970s, the upward spiral of inflation continued and threatened to take off into hyperinflation in 1979. Determined to achieve monetary stability by imposing monetary discipline and breaking inflationary expectations, the Fed allowed interest rates to rise to unprecedented levels and imposed a set of credit and refinancing controls upon the banking system. While inflation was brought down from its double-digit levels to around the 4% level by 1982 -- at the cost of the worst postwar recession (both domestically and internationally) involving the loss of millions of manufacturing jobs and destruction of the pattern bargaining industrial relations system -- the Fed was hampered from bringing down inflation to lower levels by the collapse of the Penn Square Bank and the threatening LDC debt and S&L sector crises; in the wake of the Penn Square Bank failure, the Fed loosened monetary policy substantially.

Despite relatively lackluster economic performance in 1975 and 1976, inflation remained at levels higher than those reached during "boom" periods in

the 1950s and early 1960s. As economic activity picked up in 1977, inflation started rapidly moving toward double-digit levels again. The Fed reacted to increasing inflation by tightening monetary policy drastically. The discount rate was almost doubled in a series of steps during 1977 and 1978: up to 5.75 percent and 6 percent in the third and fourth quarters of 1977, and to 6.5 percent, 7 percent, 8 percent and 9.5 percent in each of the quarters of 1978. Nevertheless, economic growth continued and the increase in the CPI reached 12.3% in 1979.

It was in this context that Paul Volker, the newly elected chairman of the Federal Reserve Board, decided to move away from the targeting of the federal funds rate to the targeting of monetary aggregates. The growth in M1 became the intermediate target or objective of the Fed's monetary policy; nonborrowed bank reserves, as a variable more directly under the Fed's control but in theory with a fairly predictable link with M1 became the immediate operating target in order to try to influence M1 growth (Fabozzi, Modigliani, and Ferri 1994).

While this change in targets was justified in terms of monetarist theory, in fact the real purpose was to push interest rates above the level they were at (i.e. already at a postwar high); the discount rate was increased to pushed to 11 percent in the third quarter and 12 percent in the fourth quarter of 1979.¹⁸ Nevertheless, inflation continued upward:

"Despite the Fed's gradual efforts to slow things down with measured increases in interest rates, the banking system was actually accelerating its lending. [In the second half of 1979] bank credit was expanding at an annual rate of more than 20 percent, and, as Fed officials heard from worried bankers, a lot of that credit was going into speculative ventures -- business and individuals borrowing in order to buy things on the rising prices, speculative investments from gold and silver to real estate. They were betting that inflation would drive prices much higher. The smart speculator would then sell the commodities or other tangibles, repay the loans and reap a smart, quick profit" (Greider 1987: 104).

In early 1980 the Fed allowed interest rates to increase even further; in addition, a set of emergency measures were implemented in order to directly control bank lending and access to funds. Additional reserve requirements were imposed upon managed liabilities such as CDs and Eurodollar borrowings and controls were imposed on additional lending. These controls in conjunction

¹⁸ Greider (1987) provides an excellent account of the politics of the Fed and the decision to switch to monetary targeting in 1979. Monetary targeting involves setting goals for the growth of the money supply; in this case, the Fed set a target level of growth in M1, the most narrow definition of money supply. Under the theory that there is a predictable relationship between bank reserves and M1, the Fed set targets for an intermediate variable, the growth in bank reserves; the level of bank reserves are more easily controllable by the Fed than M1. The "real" reason for the switch to targeting, however, was not a sudden conversion to monetarism by board members but rather the need for political cover for pushing interest rates up to levels unknown for two generations.

with the high interest rates managed to bring the economy into the deepest postwar US recession (Greider 1987).

The easing up in monetary policy was triggered by the failure of the Penn Square National Bank in July 1982. While Penn Square was a relatively small bank (with \$500 million in assets) located outside the major banking centers (it was based in Oklahoma City), the failure spread panic because of the Penn Square's role in selling billions of loan participations to large commercial banks. More than \$1 billion alone in loan participations were sold to Continental Illinois, the largest bank in the Midwest and the seventh largest in the country. Many of these loans were high-risk investments in the oil states; with the collapse of the economy in 1981/82, many of these loans went bad. As a result of the fear of a spread of bank failures throughout the banking system, all but the most sound banks found it difficult or impossible to sell large CDs, worsening the credit crunch for their business customers (Wolfson 1994).

Adding to the Fed's worry about the soundness of the banking system was the growing danger of anxieties were rising about Mexico's ability to pay its debt). In addition, other segments of the financial system were also threatened by the high interest rates and recession. Drysdale Securities, a broker/dealer firm, had gone bankrupt and sent a panic through Wall Street. The S&Ls and smaller community banks were also threatened by high interest rates. Unlike larger banks, they did not have the ability to issue large CDs to compete for short-term funds. The record-high interest rates triggered a flow of funds out of the S&Ls and smaller banks into other instruments such as the new money market funds which were not subject to Regulation Q interest rate restrictions. The problem was worsened by the "lock-in" of S&L and much of smaller bank investments in long-term mortgages at fixed and low interest rates. This problem of "disintermediation" threatened the liquidity and solvency of the S&L and community bank sectors.¹⁹

The combination of these problems -- the collapse of the Penn Square, uncertainty on Wall Street through the failure of Drysdale Securities, and the looming LDC debt and S&L/community bank crises persuaded the Fed to rapidly ease up on monetary policy and abandon the monetarist experiment in targeting monetary growth it had started in 1979, though inflation had not been brought down to the near-zero levels hoped for. Despite the deepest postwar recession involving the loss of millions of manufacturing jobs and the destruction of pattern bargaining (due to the loss of demand domestically and the eroding competitiveness of exports due to a doubling of the value of the dollar), the inflation rate would average around 4% for the next few years, i.e. at a level about twice that tolerated in Germany.

¹⁹ For the description of this mechanism of disintermediation see Treasury of the US (1979).

The Stock Market Crash of 1987 and Credit Crunch of 1990-92

While the threat of hyperinflation was killed by the 1980-82 recession, inflation continued to be a problem and concern for the Fed. A speculative boom fueled largely by an explosion in the supply of high-risk debt had started after 1982. Under the philosophy of deregulation pushed under the Reagan administration, many constraints on the activities of banks and S&Ls had been removed; many states also loosened up restrictions on state banks and finance companies (e.g. through the removal of usury ceilings). In search of higher returns, many of these intermediaries were willing to incur the higher risks involved in investments in areas such as corporate finance and construction/real estate.

The greatest risky activity in corporate finance occurred in the area of highly leveraged transactions. Highly leveraged transactions come in different forms, such as hostile takeovers, leveraged buyouts, and recapitalizations; however, the common characteristic is that they involve a substantial increase in the debt level of the company involved. Often the level of equity was substantially reduced by trading equity for debt. Highly leveraged transactions typically involved a package of financing including both junk bonds (bought by thrifts, pension funds, and insurance companies) and loans from commercial banks.

As became obvious in the recession of the early 1990s, when defaults on highly leveraged transactions increased, that many of these highly leveraged transactions violated prudential standards. The proportion of cash flow committed to interest payments increased dramatically for many companies, decreasing the funds available for investment. During this recession, cash flow in many companies (especially for those in highly cyclical industries) was grossly insufficient to finance interest payments, and these companies defaulted. An estimated 30% of these highly leveraged transactions -- most financed by a combination of junk bonds and bank loans -- went into default (Gilson, Kose, and Lang 1990) (Hastings 1991).

Banks and S&Ls also aggressively expanded their commercial real estate lending and investment. Real estate lending is one of the more prosperous but risky forms of bank investment:

"During prosperous times, short-term real estate loans are among the most profitable investments and thus are extremely attractive to growth-oriented banks...Real estate loans can be highly speculative, however, if banks lend against properties that do not generate predictable cash flows...The underlying real estate is often commercial property built under the assumption that lease rates and occupancy would quickly rise" (Koch 1995: 651).

Prudential rules normally followed in construction-related lending were widely violated in the mid-1980s despite growing evidence of overbuilding.²⁰

²⁰ Three kinds of prudential rules can be followed in order to reduce risk. Financial organizations providing medium-term construction financing (typically commercial banks) can insist that

The worst overbuilding was in commercial construction. Downtown office market vacancy rates increased from less than 4% in 1980 to about 20% in 1989. Investment in office construction in the 1970s fluctuated in a narrow band between \$10 and \$15 billion dollars a year (measured in constant 1987 dollars). In the 1980s it averaged over \$25 billion per annum, reaching a peak of \$37 billion in 1985 despite the fact that vacancy rates had already rose to 15%. Suburban shopping centers and industrial vacancy rates also increased substantially, though not as much as for office space. The overbuilding eventually led to a collapse in real estate prices in the Northeast, Texas, and parts of California and mass defaults on real estate loans. The overall problem loan rate for construction loans reached over 20% for larger banks in the early 1990s (Henderschott and Kane 1992) (Boyd and Gertler 1993).

Concern about the speculative nature of much of this lending and the upward creeping of inflation led the Fed to once again tighten up monetary policy. This effort, however, was constrained by the Stock Market Crash of 1987, which resulted in a decline in the value of stocks by some one third (i.e. a level comparable to the decline in the weeks following "Black Friday" in 1929). In order to increase the liquidity of the financial system and ward off a panic, the Fed greatly loosened up monetary policy. Risky lending activity continued to increase; 1988 was the greatest year for corporate reorganizations leading to a "debt explosion" and the deterioration of debt-equity levels by nonfinancial corporations. The inflation level increased to 5% for the rest of the 1980s.

The slowdown in lending and economic activity and inflation was precipitated through a major financial system crisis. In a departure from the previous postwar pattern, however, this crisis was triggered not through a tightening of monetary policy but rather through an endogenous crisis within the financial system. The accumulating problem loans by S&Ls and commercial banks and the increasing defaults on junk bonds created an insolvency crisis among banks and S&Ls; half of the assets of the S&L sector were wiped out in the crisis and the number of bank insolvencies reached levels not seen since the bank crisis of the early 1930s (after the Stock Market Crash of 1929 over 1,000 banks failed) (Boyd and Gertler 1993). Even banks that did not go insolvent cut back their lending in order to rebuild their capital levels; pension funds and insurance companies, which during the mid-1980s had also shown a new taste for high-risk investments such as junk bonds, also decreased their

developers have permanent financing lined up for the period after construction is completed. Financial organizations can insist on seeing that tenants are committed to occupying the properties. Finally, financial organizations can insist that developers take a substantial equity stake in the project, which provides both a financial "cushion" in case projections are not achieved and a guarantee that developers have a financial stake in the success of the project. All three of these standards were violated by thrifts eager to expand their business. Developers were no longer required to line up occupants and permanent financing before construction. A number of thrifts also lent the money to developers to finance their equity stakes or reduced equity stake requirements to nominal amounts, shifting risks away from the developers onto themselves (Koch 1995).

corporate lending and switched investments to safer assets such as government debt. The economic slowdown of 1990-92 was caused by a credit crunch, i.e. unavailability of debt to companies to finance new projects or (in many cases) to refinance outstanding loans (Berger and Udell 1994; Cantor and Wenninger 1993; FRBNY 1994).

3. The German Case

In contrast with the fragmented US regulatory regime, the German financial system is characterized by the encompassing regulation of the banking system and the monopolization by the banking system of many types of financial activities, particularly involving short-term assets. The three other groups of financial intermediaries -- insurance companies, building and loans (B&Ls) and investment companies -- are only allowed to take specific-purpose long-term savings and are highly restricted in the types of investments they may make. Furthermore, the open money market in Germany is minuscule; nonfinancial companies have been prohibited from issuing commercial paper and government practice has been to issue securities (with minor exceptions) in the long-term maturity range.²¹ As a result, the banking system has been relatively free of the problem of regulatory arbitrage and banking regulatory authorities have been able to tighten prudential regulation in response to increasing systemic risk. Furthermore, the central position of the banking system has resulted in a more effective and predictable monetary policy and enabled corporatist arrangements for stabilizing interest rates, particularly long-term rates in the context of an open economy. With the collapse of the Bretton Woods system in the early 1970s, the main constraint upon monetary stability was removed and the Bundesbank was able to arrest the upward ratcheting of inflation in the mid-1970s.

3.1 Encompassing Regulation and Bank Monopoly

In contrast with the US case, the financial regulatory system can be characterized as "encompassing" and bank-dominated. Regulation of the banking system is clearly centralized with the federal banking authorities; furthermore, the limited number of non-bank sectors are also centrally regulated and constrained from activities in the short-term asset end of the financial system.

²¹ Note however that these restrictions have been somewhat loosened in the early 1990s through the limited authorization of commercial paper programs and money market funds.

Table 4:
Distribution of German Banking System Assets, 1994

	Business Volume (as % of total Banking System)	Number of Banks
Ordinary Banks	77.4%	3676
Commercial Banks	24.0%	336
Large Commercial Banks	9.0%	3
Regional Banks	12.7%	199
Private Banks	1.0%	71
Branches of Foreign Banks	1.3%	63
Public Savings Bank Sector	38.2%	670
Regional Banks & National Giro	17.7%	13
Public Savings Banks	20.5%	657
Credit Cooperative Sector	15.2%	2670
Reg Banks & National Giro	3.3%	4
Credit Cooperatives	11.9%	2666
Specialized Banks	22.6%	51
Mortgage Banks	12.0%	33
Special-Purpose Banks	10.6%	18
Total	100.0%	3727

Source: Own Calculations from Deutsche Bundesbank, Bankenstatistik: Statistisches Beiheft zum Monatsbericht 1

Encompassing Banking Regulation

The centerpiece of banking regulation is the 1961 Banking Act, which is largely based on the 1934 Banking Act passed in response to the banking crisis of 1931, was the first piece of national legislation for the comprehensive regulation of the German banking system.²² While the Banking Act represents a comprehensive revised in 1961, the basic principles of bank regulation which still hold today were established in the 1934 Act.

The federal bank regulators, the Bundesbank and the Federal Bank Supervisory Office, have been designated as the primary regulators of the banking system. The states have regulatory authority only over one section of the banking system, the public savings banks within their geographical jurisdiction, and this authority takes the form of "additional" regulation; i.e. federal banking standards set a floor under which state regulation of the public savings banks cannot go under.

This centralization exists despite the efforts of the US occupational forces to impose a decentralized financial regulatory system upon Germany. The large Berlin banks were broken up into smaller banks and the regions were given regulatory authority over them. In the 1950s, however, geographical restrictions on bank branching were removed and the banking system recentralized. The 1961 Banking Act, which was essentially a revision of the 1934 Banking Act, reaffirmed the principle of centralized regulation. While some of the regional governments took the issue to court after the passage of the 1961 Banking Act, the Supreme Court reaffirmed the precedence of federal over state regulation of the banking system (Büschgen 1983). The Banking Law authorizes broad powers to charter banks, establish prudential standards for capital and liquidity ratios and standards for risky investments.

Contrary to the common perception of domination by a few large "universal" joint-stock banks, in fact the German banking system is characterized by considerable diversity in terms of ownership form. The so-called "ordinary" banks, which account for three-quarters of the total business volume of the banking system, are allowed to engage in a broad variety of banking business such as deposit-taking and lending activity (see Table 4).

²² Prior to the 1931 Banking Crisis, only segments of the German banking system were subject to national regulation: only banks that issued bank notes were subject to regulation under the Banking Act of 1875 (*Bankengesetz*). The mortgage banks were also subject to regulation at the national level under the Mortgage Bank Act of 1899 (*Hypothekbankgesetz*). The credit cooperatives were regulated to a very limited extent by a general law for cooperatives, the Cooperative Act of 1899 (*Genossenschaftsgesetz*). The public savings banks were subject to a limited degree of regulation at the sub-national level (Büschgen 1983).

Unified regulation of the three different groups of "ordinary" banks, which are distinguished by ownership form but all engage in a broad spectrum of deposit-taking and lending activities: commercial banks, public savings banks, and credit cooperatives.²³

In addition to the "ordinary" banks, a number of "specialized" banking institutions (which in the US would be classified outside of the commercial banking sector) also fall under the supervision of the bank regulatory system. Specialized banks, which are generally established to fulfill limited functions and are restricted to a narrow range of banking activities, account for about one quarter of banking system business volume; about half of the business volume of the specialized banks is accounted for by the mortgage banks, which are dedicated to raising funds for and originating mortgages, while the other half is accounted for by public or quasi-public special-purpose banks for the provision of credits for export, small businesses, or long-term industrial finance. Regulation of these institutions is typically stricter than that of the ordinary banks, i.e. ordinary bank regulations constitute a "floor" for specialized bank regulation.²⁴

Encompassing Regulation of Non-Bank Financial Intermediaries

While ordinary banks are authorized to engage in a wide variety of financial services activities, financial intermediaries outside of the banking system have been typically authorized to engage only in a single or an extremely limited spectrum of activities. These financial intermediaries include the building and loans (*Bausparkassen*), the insurance industry (including supplementary

²³ It is interesting to search for parallels in the US for these groups. The *Kreditbanken*, which the Bundesbank translates as "commercial banks," have the most direct parallel, to the US commercial banks; however, the German definition is somewhat broader, also including a group of "private" banks (i.e. bank partnerships). The savings banks in Germany (*Sparkassen*) are most directly related to the mutual savings banks in the US, both of which were established to encourage savings among the working class. Unlike the US mutual savings banks (which are only found in a few of the older states), however, all but a handful of the German savings banks are publicly owned and have played a central role in financing communal infrastructure. Finally, in ownership form the German credit cooperatives (*Genossenschaftsbanken*) parallel the US credit unions; however, the German cooperatives were originally owned by groups of farmers (in the case of the regional cooperatives) and craftsmen (in the case of urban cooperatives) for providing business credit, whereas the US credit unions focused on consumer credit for the employees of a specific employer or members of a profession.

²⁴ For example, special provisions is made for real estate finance, one of the riskiest forms of long-term lending. Bridge financing and mortgages are provided by specialized mortgage banks. The Mortgage Bank Law imposes extremely conservative regulations on mortgage lending; mortgage loans are not to exceed 60% of the worth of collateral property and must be fully funded by long-term funds, and limits are placed on funding for properties-in-construction. While ordinary banks may own mortgage banks, they must be separately capitalized and funded. It is significant that Germany was one of the few advanced industrialized countries to avoid a credit-financed speculative boom in real estate in the 1980s.

pension funds not directly accounted for through company reserves), and the securities industry. Each of these groups of financial intermediaries has unified regulation at the federal level and (with the exception of the authorization of money market funds in the 1990s) has been effectively kept out of the short-term asset activities.²⁵

Building & Loans (Bausparkassen)

The Building & Loans are regulated under the Building & Loan Act (*Gesetz über Bausparkassen*) and the Banking Act (*Kreditwesengesetz*). Although the building & loans were regulated for the first half of the century by the national *Supervisory Office for Insurance and Building & Loans*, the building & loans were shifted to the jurisdiction of the federal bank regulators shortly after the passage of the 1961 Banking Act. Publicly-owned building & loans (most of these are owned by public savings bank associations) are subject to the regulatory authority of the regions; however, regulations set by the *Bank Supervisory Office* function as a floor for public building & loan regulation as well as de facto regulation for the privately-owned building & loans.²⁶

The German building & loans are only allowed to take "dedicated" savings deposits. According to § 1 of the Building & Loan Act, the B&Ls must take deposits in the context of a regular savings plan; the accumulated sum in the savings plan is to be used for second mortgages. If a saver does not draw down the savings for a mortgage, then the savings only become available to the saver after a seven to ten year period. The primary investments permitted for the *Bausparkassen* are second mortgages. Other than bank deposits, the only other permissible investments are in "safe" government and bank bonds in order to earn interest on accumulated savings deposits (§ 4 of the Building & Loan Act).

Thus, in contrast to the US thrift institutions, the German B&Ls have essentially been kept out of competition with the banking sector for short-term funds. Unlike the general purpose savings deposits at the S&Ls, the "dedicated" savings deposits at the B&Ls cannot be rapidly shifted in response to changes in the comparative advantage of different types of assets. Furthermore, the S&Ls can only engage in a limited type of credit creation (mainly second mortgages) and are constrained in the level of mortgage financing they can provide by the level of "dedicated" savings they can attract.

²⁵ German banks are "universal" in the sense that they are allowed to be involved in these markets through the ownership of these intermediaries as subsidiaries.

²⁶ The German Building and Loans (B&Ls) have a similar purpose as the original Savings & Loans in the United States, i.e. dedicated single-purpose saving towards the acquisition of a residential mortgage. Unlike the US S&Ls, however, restrictions on the funds that B&Ls may attract and investments they may make have not been loosened in the past decades.

Insurance Companies

Insurance companies are subject to the regulation of the Federal Insurance Supervision Office. The most significant segment of the insurance industry in terms of assets is the life insurance industry due to the need reinvest life insurance policy payments for payback to policyholders or their survivors; other branches of the insurance industry are more or less currently financed and have relatively little need for the accumulation of great assets.²⁷

A significant proportion of the insurance industry's business is the administration of supplementary pension funds. Two-thirds of supplementary pension claims are accounted for directly through reserves in their balance sheets, i.e. are direct liabilities of the company. Roughly one third of pension claims, mainly for non-civil servant employees in the public sector and in smaller companies, however, are accounted for by these independent pension funds run by the insurance companies. In investing the assets of these pension funds insurance companies are to follow essentially the same guidelines as for the investment of life insurance policy assets.

The permissible investments of German life insurance companies are more restrictive than is the case for US life insurance companies; the bulk of investments are accounted for by real estate, long-term bank deposits, or bank bonds. More than half of the investments they make are channeled directly to the banking sector through investments in bank bonds and long-term time deposits.

Securities Industry

While the stock exchanges are formally decentralized and subject to a degree of regional regulation, they are also subject to federal securities law and regulations (Börsengesetz, Wertpapierzulassungs-Verordnung, Verkaufsprospektgesetz, etc.).²⁸ The major actors on the exchanges are banks, which are subject to federal banking regulation in their major activities.

The nature of regulation of the stock exchange renders it a relatively unsuitable form for liquid savings, particularly for household savings. The denomination of stocks and the commissions for the purchase and sale of securities is high relative to the US. These barriers are reflected in the relatively low level of shareholding by households and their preference for bearer (i.e. non-negotiable) bonds offered by banks, which come in smaller denominations

²⁷ For the development of insurance regulation up to the 1950s see Rohrbeck (1955).

²⁸ The authority of brokers, the financial agents most directly regulated by regions, is limited to market-making; brokers are not allowed to hold significant positions of their own in securities or to underwrite securities issues.

and carry somewhat lower interest rates than negotiable bonds but no trading commission.

Until recently the development of money market funds was effectively constrained by regulatory authorities, who (in part based on the US experience) are concerned about the possible undermining of monetary control through the proliferation of these funds. The Bundesbank has also restricted the development of an open money market by discouraging the issuance of short-term bills by the government and, until recently, prohibiting the issuance of commercial paper by nonfinancial companies. The relative significance of money market securities as a short-term asset remains limited compared to the US.

Thus, to summarize, the main competitors to banks for long-term investment, the building & loans and life insurance companies, tend to lock in savings for single purposes with little or no liquidity. Negotiable securities also are unfriendly through their high denominations and illiquid through the imposition of high commissions. More friendly for general-purpose household savings are bank bearer bonds, which however are illiquid and thus not in competition with other forms of investment in the short run.

3.2. Consequences of Encompassing Regulation

Two of the consequences of encompassing regulation have been (1) the capacity of German bank regulatory authorities to maintain strict prudential regulation without major problems with regulatory arbitrage, thus supporting a strong banking system relatively free of liquidity and solvency crises, and (2) a high degree of predictability and efficiency in monetary policy.

Strict Prudential Regulation

Germany was one of the first countries to develop binding and uniform quantitative standards for bank capital ratios; it thus anticipated by about five decades the 1988 Basle Agreement to introduce minimum capital ratios in most advanced industrialized countries (Hall 1993). Germany has also been in the vanguard of banking regulation in its use of explicit liquidity requirements for long-term lending; most countries (e.g. the US up until the 1960s and Japan until recently) have attempted to deal with the liquidity risk involved in long-term lending by segmenting the financial system into short-term and long-term financial intermediaries.²⁹

²⁹ As a side note, German bank regulation has also been in the vanguard in defining explicit standards for exposure to default risk. The Banking Law of 1961 also explicitly authorizes regulations regarding the types and extent of risky investments banks may make. This includes

The 1934 Banking Law authorized the establishment of prudential standards for banks. A new framework for bank regulation was established in the Banking Law of 1961 (effective January 1962). According to the law, the Federal Office for Bank Supervision, in consultation with the Bundesbank and the national banking associations, was authorized to establish quantitative standards for bank capital and liquidity. Pursuant to this authority, and in line with the guidelines the Bundesbank had enforced throughout the 1950s, the Federal Bank Supervisory Office issued three Principles considered the "heart" of prudential regulation of banks: Principle I concern minimum capital standards, while Principles II and III concern the liquidity of banks through standards for the adequate coverage of long-term investments through long-term sources of funds.

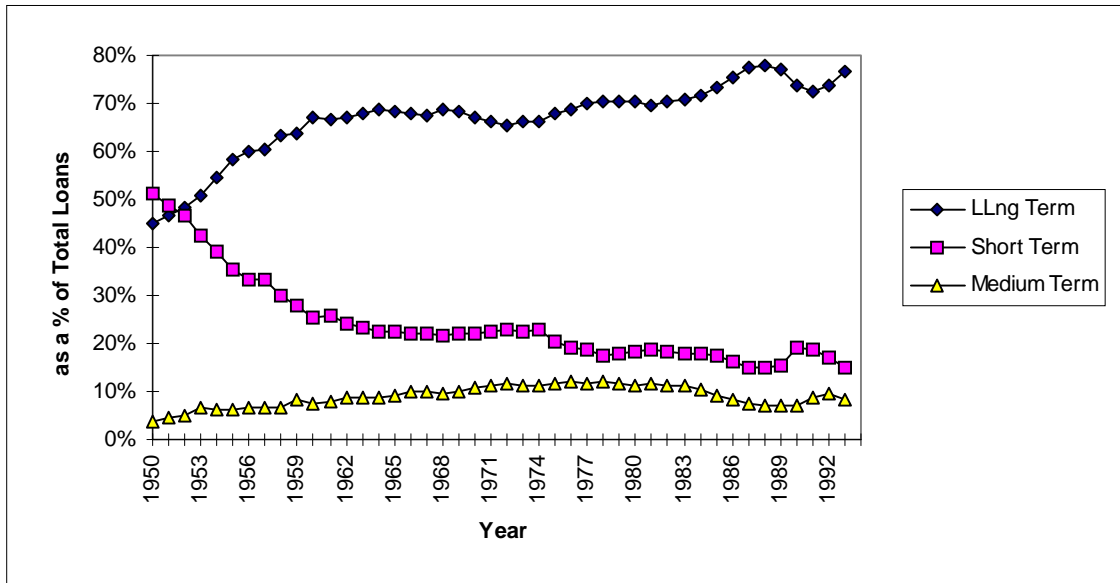
Principle I prohibits banks from holding specified assets in excess of 18 times their own capital base (Eigenkapital). Principle I originally concerned the ordinary banks; however, Principle I has been modified a number of times in order to extend its application to the specialized banks under the Federal Office for Bank Supervision's jurisdiction, to take account of innovations and perceived weaknesses in the financial system, and to adapt to European banking directives.

In 1964 and 1969, Principle I was extended to finance companies and to credit guarantee companies. In 1972, the application of Principle I (along with the liquidity principles) was modified to avoid "multiple counting" of capital and long-term funds through bank holding companies. In 1974, in response to the collapse of the Herrstatt bank, Principle I was augmented by Principle Ia, which restricted banks from having open derivative positions exceeding 30% of own capital; in 1980 Principle Ia was modified to include precious metals futures (Büschgen 1983). As a result of the clear capital requirements and strict enforcement of these standards, German banks have had a high level of capital in international perspective; in comparison with other countries, the capital ratio of German banks did not deteriorate during the 1970s and 1980s and most German banks were already in or near conformance with the standards set in the 1988 Basle Agreement.

The two other core standards set by the Federal Bank Supervisory Office (Principles II and III) regulate banks' exposure to liquidity risk; in order to minimize this risk, banks are constrained from using short-term sources of funds to finance longer-term investments. Principle II requires that long term investments (loans over four years, equity, and illiquid securities) must be

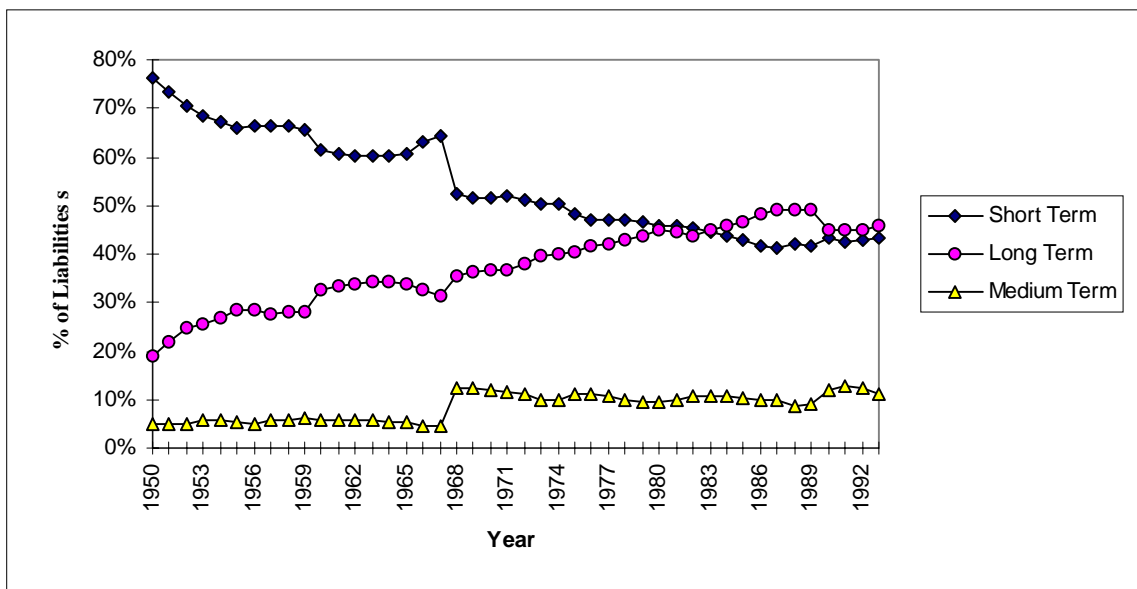
quantitative exposure to large loans (*Grosskredite*) and the requirement that these large loans must be unanimously approved by bank's top managers and registered with the Bundesaufsichtsamt. Insider credits (i.e. loans to the officers and directors of a bank) require the unanimous approval of top managers and majority approval of supervisory board; large insider credits (over DM 250 000) to be registered with the Bundesaufsichtsamt. All loans of at least DM 1 Million (*Millionenkredite*) are also to be registered with the Bundesaufsichtsamt.

Chart 4:
Maturity Structure of German Bank Loans to Nonbanks



Source: Own calculations from Deutsche Bundesbank data

Chart 5:
Maturity Structure of German Bank Liabilities to Nonbanks



Source: Own calculations from Deutsche Bundesbank data

adequately covered by long-term deposits, bank bonds, and own capital. Principle III requires that medium-term investments and securities be adequately covered by medium-term funds.

These liquidity principles, particularly Principle II, have represented an effective constraint upon banks' long-term investment activity and exposure to liquidity risk throughout the postwar period. As reported in the Bundesbank Annual Reports, the ordinary banks as a whole have generally used more than 90% of their authorized long-term investment capacity under Principle II. In order to satisfy the high demand for long-term loans from industry, the banks have had a major incentive to attract long-term household savings through the use of small-denomination high interest savings bonds. The various banking groups have also had an incentive to purchase or develop close relations with life insurance companies, which both buy bank bonds and place long-term deposits with banks.³⁰

Thus the increase in long-term investment by banks has been balanced by an increase in the maturity of bank liabilities. Short-term loans to nonbanks have decreased from over 50% to less than 20% of bank credit to nonbanks (see Chart 3). Bank short-term liabilities to non-banks have decreased from almost 80% to less than 50% of total liabilities (see Chart 4).

Efficient Monetary Management

Another "unique" characteristic of the German banking system is the stability of the relationship between bank reserves, the money supply and credit creation. While all of the G-7 countries have attempted monetary targeting, only Germany has been generally successful in meeting its targets and has continued the practice of announcing annual targets for money supply growth (Kole and Meade 1995).

A major factor explaining the stability of these relationships is the encompassing regulation of the financial system and the monopoly of banks over short-term funds. Much of the shifting of funds among investment vehicles with different reserve requirements that has made monetary management difficulties has been driven by competition between different segments of the financial system for these short-term funds; this competition has been one of the main motivations for financial innovations have often altered the relationship between financial variables (Frowen and Kath 1992). The lack of

³⁰ Penning (1969) cites the high demand for long-term refinance in order to cover the growing need by SMEs for long-term loans as one of the major factors motivating the merger of the rural and urban cooperative banks into one group and this group's expanded activity in the insurance area.

competing segments for these short-term funds have reduced the problem of difficulties in monetary control due to the shifting of these short-term funds.

In addition, the lack of a "membership problem" as in the case of the US has reduced the constraints upon the Bundesbank's frequent changing of minimum reserve requirements in order to control bank liquidity and lending. During the 1970s, the worst period of inflation, the Bundesbank altered these requirements an average of 2.5 times a year; the Federal Reserve in contrast altered minimum reserve requirements only once a year.³¹ The Fed has basically given up using reserve requirements as an active tool of monetary policy; these requirements were only altered twice since 1980 and are currently 10% on transaction (i.e. checkable) accounts and zero on other deposit accounts (Feinman 1993). While the Bundesbank has made less frequent changes in minimum reserve requirements in the past decade than in the 1970s, it still considers these requirements an important "emergency brake" to rapidly reduce the liquidity of the banking system (Bundesbank 1995).

3.3 "Imported Inflation" and Monetary Stability

The major threat to price stability in postwar Germany up through the early 1970s was the problem of "imported inflation" due to sustained large balance of payment surpluses under a fixed exchange rate regime (Emminger 1976). According to the Bundesbank Law, the Bundesbank is obligated to maintain price stability within Germany. Under the Bretton Woods system of fixed exchange rates, however, the Bundesbank was also obligated to support the relative parity of the D-Mark with respect to other currencies.

The sustained balance of payment surpluses since 1951, however, rendered the simultaneous achievement of both goals impossible. The Bundesbank's capacity to absorb the inflow of foreign funds was substantial but, in the long run, limited. Between 1951 and 1961, for example, Germany had a cumulative balance of payments surplus of DM 43 billion; DM 32 billion of these were accumulated in the foreign currency reserves of the Bundesbank (Emminger 1976: 487). In the mid 1950s, as the surplus grew, the policy choice became clearer. One option was to reduce the surpluses through a revaluation of the DM upward in order to reduce the competitiveness of German exports and the balance of payments surplus. Another option was to inflate the domestic economy; the lowering of domestic interest rates would lead to a flow of capital to other countries offering higher interest rates as well as an increase in imports.

³¹ Own calculations from Deutsche Bundesbank and Federal Reserve Board data.

While the Bundesbank supported a revaluation of the currency, there was considerable domestic resistance to this step, particularly among German manufacturing (which feared the reduction in export competitiveness) and the large private banks. The public savings bank sector, on the other hand, strongly supported a revaluation. The conflict was temporarily solved through a 5% increase in the value of the D-Mark relative to the dollar.

Starting in 1968, however, the acceleration of growth in the US (financed in part through deficit spending for the Vietnam War and Great Society social programs) exacerbated the problem of imported inflation and the dilemma between internal and external stability. Unlike the problem of the 1950s of relatively steady balance of payments surplus, the main problem in the period 1968-73 was volatility in interest rates in the US; this volatility, in large part due to the "stop-go" dynamic of inflation-fighting by the Fed outlined in the previous section, led to quickly changing inward and outward flows of liquid funds between Germany and the rest of the world. These flows were induced in part by interest rate differentials and in part by speculation in anticipation of currency devaluation or revaluation.

A number of attempts were made to solve the problem of imported inflation while remaining within the fixed exchange rate regime. Controls were imposed on capital flows and an attempt was made at corporatist suppression of wage inflation through "concerted action." These attempts, however, were undermined by wage explosions in 1969 and 1973 and by the forced temporary switch to a floating exchange rate in 1971 during a restructuring of exchange rate policy. This dilemma was "solved" by a withdrawal of the US from the Bretton Woods system and a transition of the world financial system from a fixed to a floating exchange rate regime.

While the transition to a floating regime did not prove to be the magical solution for reasserting sovereignty over domestic monetary policy promised by some, the collapse of the Bretton Woods system did remove a major constraint on the Bundesbank's ability to pursue domestic price stability (Kloten 1976). In 1973, the Bundesbank shifted to a tight monetary policy in order to fight domestic inflation; in contrast with the experience in other countries, this year was to prove to be the "turning point" in the fight against inflation. Despite the collapse of the Herstatt bank in 1974, confidence in the German banking system was great enough to allow the Bundesbank to continue its tight monetary policy. In contrast with the US, during this period as well as in 1979/80 (in response to the drastic tightening of monetary policy in the US) and in 1991/92 (in response to unification-related inflation), the Bundesbank was able to pursue tight monetary policies without the constraint of a crisis-prone financial system.

4. Conclusion

This paper has argued that the institutional structure of financial regulatory systems should be taken into account in explaining differences in monetary policy and macroeconomic performance in advanced industrialized countries. While not presenting a full integrated theory of this institutional variable together with central bank independence and wage bargaining institutions, it has been shown that fragmented financial regulation has led to a weakening of the financial structure through regulatory arbitrage and difficulties in monetary management through the rapid shifting of liquid funds from one segment of the financial system to another. While both the US and Germany have independent central banks, the crisis-prone nature of the financial system and difficulties in monetary targeting are much stronger constraints upon the Fed than is the case for the Bundesbank.

A promising channel for further inquiry in developing such a full-blown theory would be to examine the impact of different national styles of regulation on the pursuit of monetary policy. Germany is characterized by encompassing regulation in both the financial system and in labor markets; the US in contrast is characterized by fragmented regulation and a high degree of "voluntarism" not only in the financial system but also on labor markets. The hypothesis that encompassing regulation in both labor and financial market is a prerequisite to the kind of monetary targeting and price stability pursued by the Bundesbank would be one such hypothesis worthy of further testing.

REFERENCES

- Alesina, Alberto, and Lawrence Summers. 1993. Bank Independence and Macroeconomic Performance: Some Comparative Evidence. *Journal of Money, Credit, and Banking* 256:151-62.
- Berger, Allen N., and Gregory F. Udell. 1994. Did Risk-Based Capital Allocate Bank Credit and Cause a 'Credit Crunch' in the United State? *Journal of Money, Credit, and Banking* 26 (3):585-628.
- Boyd, John H., and Mark Gertler. 1993. U.S. Commercial Banking: Trends, Cycles, and Policy. In *NBER Macroeconomics Annual 1993*, edited by O. J. Blanchard and S. Fischer. Cambridge, Mass.: MIT Press.
- Bundesbank, Deutsche. 1995. Überprüfung des Geldmengenziels und Neuordnung der Mindestreserve. *Monatsberichte* 47 (7):19-37.
- Büschgen, Hans E. 1983. Zeitgeschichtliche Problemfelder des Bankenwesens der Bundesrepublik Deutschland. In *Deutsche Bankengeschichte*, edited by I. f. B. F. e.V. Frankfurt am Main: Fritz Knapp Verlag.
- Cantor, Richard, and John Wenniger. 1993. Perspective on the Credit Slowdown. *Federal Reserve Bank of New York Quarterly Review* 18 (1):3-36.
- D'Arista, Jane W. 1994. *The Evolution of U.S. Finance, Volume 1. Federal Reserve Monetary Policy: 1915-1935*. Armonk, New York: M.E. Sharpe.
- Dixit, Avinash and Robert S. Pindyck. 1993. *Investment under Uncertainty*. Princeton: Princeton University Press.
- Emminger, Otmar. 1976. Deutsche Geld- und Währungspolitik im Spannungsfeld zwischen innerem und äußerem Gleichgewicht (1948-1975). In *Währung und Wirtschaft in Deutschland, 1876-1975*, edited by D. Bundesbank. Frankfurt am Main: Fritz Knapp Verlag.
- Fabozzi, Frank J., Franco Modigliani, and Michael G. Ferri. 1994. *Foundations of Financial Markets and Institutions*. Englewood Cliffs, N.J.: Prentice Hall.
- Fabritius, M. Manfred and William Borges. 1989. *Saving the Savings and Loan: The U.S. Thrift Industry and the Texas Experience, 1950-1988*. New York: Praeger.
- Federal Reserve Board of New York (FRBNY). 1994. *Studies on the Causes and Consequences of the 1989-92 Credit Slowdown*. New York: FRBNY.
- Feinman, Joshua. 1993. Reserve Requirements: History, Current Practice, and Potential Reform. *Federal Reserve Bulletin* 79 (6):569-89.
- Frowen, S.F., and D. Kath, eds. 1992. Monetary Policy and Financial Innovations in Five Industrial Countries: *The UK, the USA, West Germany, France and Japan*. New York: St. Martin's Press.
- Gart, Alan. 1989. *An Analysis of the New Financial Institutions: Changing Technologies, Financial Structures, Distribution Systems, and Deregulation*. New York: Quorum Books.
- Gilbert, R. Alton, Courtenay Stone, and Michael Trebing. 1985. The New Bank Capital Adequacy Standards. *Federal Reserve Bank of Saint Louis Review* 65 (5):12-20.

- Gilson, Stuart, John Kose, and Larry H.P. Lang. 1990. Troubled Debt Restructurings: An Empirical Study of Private Reorganization of Firms in Default. *Journal of Financial Economics* 27:315-53.
- Goodhart, Charles, Forrest Capie, and Norbert Schnadt. 1994. The Development of Central Banking. In *The Future of Central Banking: The Tercentenary Symposium of the Bank of England*, edited by F. Capie, C. Goodhart, S. Fischer and N. Schnadt. Cambridge: Cambridge U. Press.
- Greider, William. 1987. *Secrets of the Temple: How the Federal Reserve Runs the Country*. New York: Simon and Schuster.
- Hall, Maximilian. 1993. *Banking Regulation and Supervision: A Comparative Study of the UK, USA and Japan*. Aldershot: Edward Elgar.
- Hall, Peter. 1994. Central Bank Independence and Coordinated Wage Bargaining: Their Interaction in Germany and Europe. *German Politics and Society* 31:1-23.
- Hastings, Margaret. 1991. A Review of Corporate Restructuring Activity, 1980-90. Board of Governors of the Federal Reserve System Working Paper.
- Henderschott, Patrick H. , and Edward J. Kane. 1992. Causes and Consequences of the 1980s Commercial Construction Boom. *Journal of Applied Corporate Finance* 5 (1):61-70.
- Iversen, Torben. 1995. Wage Bargaining, Hard Money, and Economic Performance: Theory and Evidence for Organized Market Economies. Unpublished manuscript.
- Klebaner, B. 1974. *Commercial Banking in the United States: A History*. Hinsdale, Illinois: Dryden Press.
- Kloten, Norbert. 1976. Erfolg und Mißerfolg der Stabilisierungspolitik (1969-1974). In *Währung und Wirtschaft in Deutschland 1876-1975*, edited by D. Bundesbank. Frankfurt am Main: Fritz Knapp Verlag.
- Koch, Timothy W. 1995. *Bank Management*. 3rd ed. Fort Worth: The Dryden Press.
- Kole, Linda S., and Ellen E. Meade. 1995. German Monetary Targeting: A Retrospective View. *Federal Reserve Bulletin* 81 (10):917-31.
- Lange, Peter, and Geoffrey Garrett. 1985. The Politics of Growth: Strategic Interaction and Economic Performance in the Advanced Industrial Democracies, 1974-1980. *Journal of Politics* 47:792-827.
- McCauley, Robert N., and Rama Seth. 1992. Foreign Bank Credit to U.S. Corporations: The Implications of Offshore Loans. *Federal Reserve Bank of New York Quarterly Review* 17 (1):52-65.
- Miller, Richard B. 1993. Citicorp: *The Story of a Bank in Crisis*. New York: McGraw Hill.
- Moore, George S. 1959. Term Loans and Interim Financing. In *Business Loans of American Commercial Banks*, edited by B. H. Beckhart. New York: Ronald Press Company.
- Penning, Hans-Karl. 1969. *Die Zusammenarbeit der ländlichen und gewerblichen Kreditgenossenschaften mit gemeinsam getragenen Spitzeninstitute*. . Erlangen: Forschungsinstitut für Genossenschaftswesen an der Universität Erlangen-Nürnberg.
- Pyndyck, Robert S., and Andres Solimano. 1993. Economic Instability and Aggregate Investment. Paper prepared for the NBER Macroeconomics Conference, March 12. .

Reinicke, Wolfgang. 1994. Consolidation of Federal Bank Regulation? Testimony before the US Senate Committee on Banking, Housing, and Urban Affairs, March 4, 1994.

Reinicke, Wolfgang H. 1995. *Banking, Politics and Global Finance: American Commercial Banks and Regulatory Change, 1980-1990*. Aldershot: Edward Elgar.

Rohrbeck, Walter, ed. 1955. *50 Jahre materielle Versicherungsaufsicht: nach dem Gesetz vom 12. Mai 1901*. Berlin: Dunker & Humblot.

Rose, Peter and Donald Fraser. 1988. *Financial Institutions: Understanding and Managing Financial Services*. 3rd ed. Plano, Texas: Business Publications.

Soskice, David. 1990. Wage Determination: The Changing Role of Institutions in Advanced Industrialized Countries. *Oxford Review of Economic Policy* 6:1-23.

Treasury of the United States. 1979. Deposit Interest Rate Ceilings and Housing Credit: The Report of the President's Inter-Agency Task Force on Regulation Q. Washington: GPO.

Stigum, Marcia. 1990. *The Money Market*. 3rd ed. Burr Ridge, Illinois: Irwin.

Streeck, Wolfgang. 1993. Wage Restraint without Incomes Policies. Unpublished Manuscript.

Wojnilower, Albert M. 1980. The Central Role of Credit Crunches in Recent Financial History. *Brookings Papers on Economic Activity* 1980 (2):277-326.

Wolfson, Martin H. 1994. *Financial Crises: Understanding the Postwar U.S. Experience*. Armonk: M.E. Sharpe.