

NBER WORKING PAPER SERIES

THE FUTURE OF MONETARY POLICY:
THE CENTRAL BANK AS AN ARMY WITH ONLY A SIGNAL CORPS?

Benjamin M. Friedman

Working Paper 7420
<http://www.nber.org/papers/w7420>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
November 1999

This paper was initially prepared for the conference on “Social Science and the Future,” held at Oxford, U.K., July 7-8, 1999. I am grateful to Kenneth Kuttner for helpful discussions, to Michael Klein, Adam Posen, Hal Scott, participants in the conference, and an anonymous referee for helpful comments on an earlier draft, to Stephen Weinberg for research assistance, and to the Harvard Program for Financial Research for financial support. An expanded version of this paper will be published in Richard Cooper and Richard Layard (eds.), Social Science and the Future (Cambridge and London: The MIT Press, forthcoming). The views expressed herein are those of the authors and not necessarily those of the National Bureau of Economic Research.

© 1999 by Benjamin M. Friedman. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

The Future of Monetary Policy: The Central Bank as an
Army with only a Signal Corps?

Benjamin M. Friedman

NBER Working Paper No. 7420

November 1999

JEL No. E52 E58

ABSTRACT

The influence of monetary policy over interest rates, and via interest rates over nonfinancial economic activity, stems from the central bank's role as a monopolist over the supply of bank reserves. Several trends already visible in the financial markets of many countries today threaten to weaken or even undermine the relevance of that monopoly, and with it the efficacy of monetary policy. These developments include the erosion of the demand for bank-issued money, the proliferation of nonbank credit, and aspects of the operation of bank clearing mechanisms. What to make of these threats from a public policy perspective — in particular, whether to undertake potentially aggressive regulatory measures in an effort to forestall them — depends in large part on one's view of the contribution of monetary policy toward successful economic performance.

Benjamin M. Friedman
Department of Economics
Harvard University
Littauer Center 127
Cambridge, MA 02138
and NBER
bfriedman@harvard.edu

The mid-1960s Henry Levin film Genghis Khan featured a rugged-looking Omar Sharif in the title role playing opposite Robert Morley, at his plump and pompous best as the Chin emperor Wang Wei-shao. One of the film's early scenes shows the exquisitely attired Morley, calligraphy brush in hand, elegantly composing a poem. With an ethereal self-assurance born of unquestioning confidence in the divinely ordained course of worldly affairs, Morley explains that the poem's purpose is to express his displeasure at the Mongol barbarians who have lately been creating a disturbance on the Chin empire's western frontier, and, by so doing, cause them to desist.

Today expressions of intentions by leaders of the world's major central banks typically have immediate repercussions in financial markets, and perhaps more broadly as well. Does Chairman Greenspan believe that the U.S. business expansion has advanced to the point where a new round of wage inflation may be imminent? Did President Duisenberg imply that because Article 103 of the Maastricht Treaty refers to Article 102a, and both Article 102a and Article 105 refer to Article 2, Europe's chronic high unemployment may be a proper object of policy concern for the European Central Bank after all? Is Governor Hayami content to allow Japan to languish in a slump for yet another half-decade? Central bankers' public utterances and other, more subtle signals on such questions regularly move prices and yields in the financial markets, and these financial variables in turn affect nonfinancial economic activity in a variety of ways. Indeed, a widely shared opinion today is that central banks need not actually do anything. With a clear enough statement of intentions, "the markets will do the work for them."

In truth, the ability of central banks to affect the evolution of prices and output in the

nonfinancial economy has always been something of a mystery. It is not that there are no good accounts of how this influence might arise. There are many. The problem is rather that each such story, while plausible enough at first or even second thought, turns out to depend on one or another of a series of by-now familiar fictions: Households and firms need currency to purchase goods and services. Banks can issue only reserve-bearing liabilities. No nonbank financial institutions create credit. And so on.

This central mystery notwithstanding, at the practical level there is today little doubt that a country's monetary policy not only can but does largely determine the evolution of its general price level over the medium to longer run, and almost as little doubt that monetary policy exerts significant influence over aspects of real economic activity, like output and employment, over the short to medium run. The assumptions necessary to explain in simple terms how this happens are fictions, but they are useful fictions. Apart from purely empirical matters of magnitude and timing, the live question today is which set of fictions (that is, which model) provides the most useful description of the underlying causal process.

Circumstances change over time, however, and when they do the fictions that once described matters adequately may no longer do so. A later scene in Levin's film shows Morley still magnificently clothed but now lying in the mud, face blackened by gunpowder, in the wake of a Mongol attack on the Chin capital. There may well have been an earlier time when the might of the Chin empire was such that the mere suggestion of willingness to use it was sufficient to make potential invaders reconsider and withdraw. But by Wang Wei-shao's day that time had evidently passed.

The object of this paper is to consider the possible future of central banks' monetary policymaking — say, over the next quarter-century — in light of several significant aspects of how the circumstances that bear on this process have been changing over the past quarter-century. Simply extrapolating in this way the recent development of financial market institutions and practices is, of course, no substitute for actually knowing what lies ahead, but doing so at least provides some observationally grounded basis for thinking about the future. The point is to work out the implications for central banks' ability to carry out monetary policy. The question of what to do in response to those implications, should they indeed materialize, lies beyond the scope of this paper.

The Central Bank as Monopolist

The easiest way to see why the influence of central banks over nonfinancial economic activity is such a puzzle is to consider their small size, and the even smaller size of their monetary policy operations, in relation to the economies that they supposedly influence. In the United States, for example, a year's production of final output is more than \$8.5 trillion. Including the production and exchange of intermediate goods and services, the volume of nonfinancial transactions that take place in the course of a year is several times \$8.5 trillion. Yet the total volume of reserves that banks and other financial institutions maintain with the Federal Reserve System is less than \$50 billion. And the difference between 2% per annum growth of reserves (which most observers would consider a tight monetary policy, all else equal) and 10% per annum reserves growth (which most would think highly expansionary) is whether the Federal Reserve buys \$1 billion or \$5 billion of securities over an entire year.

The more typical way of looking at the central bank's influence over the nonfinancial economy side-steps these quantitative disparities by focusing on market interest rates. Firms as well as households rely on borrowing to finance their spending for many purposes, from putting up factories and houses to buying new cars and refrigerators, to paying college tuitions or simply taking vacations. It is not surprising that the cost of financing these expenditures therefore affects the willingness to undertake them. Moreover, in many cases where spending does not rely on borrowing, interest rates and expected asset returns more generally represent the relevant opportunity cost. Hence the ability to affect interest rates and asset returns is in turn sufficient to enable the central bank to affect spending in nonfinancial markets.

But this line of thinking only pushes the anomaly to be explained into a different arena: How, exactly, does the central bank affect interest rates? Here again, even a quick glance at the relevant magnitudes highlights the problem. In the United States, for example, the outstanding volume of securities issued directly by the U.S. Treasury is \$3.7 trillion. Including issues of U.S. Government-sponsored and guaranteed agencies brings the overall size of the government securities market to \$7.1 trillion. Further including privately issued but publicly traded debt instruments that are close substitutes for government securities of one maturity or other brings the total size of the U.S. fixed-income securities market to \$13.6 trillion. In 1998 alone, insurance companies bought (on net) \$101 billion of securities in this market, pension funds bought \$186 billion, banks bought \$82 billion, and households liquidated \$57 billion of securities that they already owned. Gross trading volume is typically in the hundreds of billions of dollars daily, and it is not unusual for a single private firm to buy or sell more than \$1 billion of securities in a single transaction. Yet it is somehow supposed to make a major difference, for the entire level and structure of prices and yields in this nearly \$14 trillion market, whether the Federal Reserve buys or sells \$1 billion or \$5 billion of securities over an entire year.

As Table 1 shows, a similar disparity between the magnitude of central banks' monetary policy operations and the size of the markets in which they operate is characteristic of other economies as well. Going on to consider currency substitution — in other words, the fact that for many investors a debt security denominated in a foreign currency is an actual or potential portfolio substitute for a comparable debt security denominated in the currency of the investor's country of residence — only makes the disparity all that much greater from the perspective of any

individual central bank (though not for all central banks taken together, as if they acted in concert). Considering equity securities as actual or potential substitutes for debt securities makes the disparity greater still, from the perspective of either a single central bank or all taken together. (The volume of equity securities held in U.S. markets was \$15.4 trillion at 1998 yearend market prices.)

The standard explanation for central banks' ability to affect such large markets through such small operations is that transactions by the central bank are fundamentally different from transactions by private market participants. When a central bank buys securities, it makes payment by increasing the reserve account of the seller's bank, thereby increasing the total volume of reserves that the banking system collectively holds. When a central bank sells securities, it receives payment by reducing the reserve account of the buyer's bank, thereby reducing the total volume of reserves. No other market participant can either increase or reduce the total volume of reserves. The central bank is a monopoly supplier (and withdrawer) of reserves.

This monopoly position matters because under any of a variety of conceptions of the monetary policy process, banks and other financial institutions must hold reserves with the central bank in order to carry out the economic functions that households and firms look to them to perform. The traditional "money view" of monetary policy begins with households' and firms' demand for bank-issued money, against which banks must, by law, hold reserves (usually specified as some set fraction of each bank's outstanding deposits). When the monopolist central bank reduces the supply of reserves, banks therefore must reduce the amount of money that they supply to households and firms. As households and firms compete with one another to hold the now

shrunk supply of money, their individual efforts to sell securities for money cannot produce any more money but do, collectively, drive the price of securities down — that is, they drive interest rates up.

The “credit view” of monetary policy focuses on a different aspect of the relationship between the financial and nonfinancial worlds, but for this purpose it leads to the same conclusion. Households and firms look to banks to extend loans (credit). Banks can do so only to the extent that they simultaneously create money — in other words, the respective totals on the two sides of any bank’s balance sheet must always remain equal. But if banks must create money in order to advance credit, and creating more money means requiring more reserves, the central bank’s role as monopoly supplier of reserves is again crucial. When the central bank reduces the supply of reserves, banks have to cut back on their lending, and the loan market will clear at a higher interest rate.

Some observers of financial markets, mindful of the intertemporal arbitrage conditions that relate the pricing of short- and long-term securities, attempt to skirt this kind of reasoning and argue that the central bank can affect interest rates on all but the shortest-term instruments — and hence can influence nonfinancial economic activity — merely by signaling its intention to change the prevailing level of short-term rates in the future. Hence a signal of intentions is sufficient to influence nonfinancial activity as well. The basic idea underlying this argument is that, apart from whatever risk and liquidity premia the market assesses, the yield on a two-year bond should equal the (geometric) average of the currently prevailing one-year yield and the expected one-year yield a year in the future. If the central bank does or says something that changes expectations about

next year's short-term rate, it thereby moves today's long-term rate. And since many if not most kinds of spending by households and firms are more sensitive to long- (or at least medium-) than short-term interest rates, doing so thereby affects the nonfinancial economy as well. It is just this kind of reasoning that people have in mind when they speak of letting the markets do the central bank's work for it.

But this logic makes sense only if the central bank can credibly affect widely shared expectations of future short-term interest rates, and unless most market participants are prepared to be fooled most of the time, that in turn makes sense only if the central bank can indeed affect actual short-term interest rates when the time comes. And that ability, in turn, relies on some process like the ones described by the familiar "money view" and "credit view." At the end of the logical chain, the central bank's role as the monopoly supplier of reserves is essential.

Threats to the Relevance of the Central Bank's Monopoly

It may seem odd, at the close of the twentieth century, to suggest that the ability of central banks to control or at least shape the development of their respective economies stands at risk. Two decades ago chronic price inflation had reached levels that profoundly disturbed not only many economists and public policy mavens but also much of the general public in most of the world's industrialized countries. In some countries prices threatened to rise even faster, perhaps explosively. Today inflation is negligible in most industrialized countries, and almost everyone awards central banks primary responsibility for this dramatic reversal. Over just the last decade many large economies have also experienced reduced instability of output and employment, and

many people credit central banks for this accomplishment too. In short, it has been a good era for monetary policy.

But financial institutions and financial practices are changing, and the direction of many of these changes spells trouble for the ability of central banks to carry out their monetary policy responsibilities effectively. The heart of the matter lies in the way central banks influence market interest rates. In most countries there is no challenge to the central bank's position as the monopolist controlling the supply of reserves. Rather, the question is whether that monopoly will remain relevant.

Erosion of the Demand for Bank Money. Being a monopolist is of little value if nobody needs, or even wants, to have whatever the monopoly is of. The "money view" of monetary policy begins from the assumption that households and firms need money, for transactions purposes or portfolio purposes or both, and goes on to exploit the fact that banks can create money only if they have the reserves they are required to hold in parallel with their outstanding deposits. (In the United States today, for example, banks are required to hold reserves against forms of deposits used to settle transactions but not against other kinds of deposits, like savings accounts and CDs.) That is what makes the central bank's monopoly over the supply of reserves relevant.

In recent years, however, the development of new technologies has advanced to the point where there are a variety of visible alternatives to conventional bank money as a means of undertaking transactions, and in some cases even of settling transactions. Especially with the introduction of third-party credit cards in the 1960s, and increasingly so since then, economists'

standard “cash in advance” models have no longer borne much relation to arrangements for purchasing goods and services in the modern economy. For most items, neither cash in one’s pocket nor an adequate balance in one’s checking account is necessary at the time of purchase. More recent improvements like electronic cash, and “smart cards” (which have now made significant inroads in such countries as Germany, France and Japan and are just coming into use in the United States), have accentuated this trend.

The reason central banks’ influence over interest rates has survived these developments is that money, in the conventional sense, has remained necessary for ultimate settlement of these transactions. The merchants who accept Visa or Mastercharge cards need to be paid, and that still means having conventional money deposited into their bank accounts. And once a month individuals who use these credit cards must make a payment by transferring conventional money out of their bank accounts (unless they borrow the money that is due — about which more below). For reasons well described by familiar models of the “transactions” and “precautionary” demand for money, the ability to buy goods and services at will throughout the month but then settle all of the transactions together at month’s end may well reduce the typical household or firm’s average need to hold money balances, but it does not eliminate this need. Hence banks’ demand for reserves may be smaller, for a given fractional reserve requirement, but it remains as well. As is well known, the central bank’s ability to carry out monetary policy depends not on the size but on the stability of the demand for reserves.

The future may be different, however, in either of two ways that bear on just this question. First, some types of “smart cards” — for example, the single-vendor advance-payment cards

already put into circulation by many telephone service providers (this practice is now especially widespread in Japan), or by the New York subway system — could develop into genuine private monies. In New York, for example, the Metropolitan Transit Authority has made several attempts, to date largely unsuccessful, to persuade city-area merchants to accept MTA smart cards in payment for purchases. Even if such cards were to gain acceptance, as long as issuers like the MTA in turn settled with merchants by transferring balances at banks, then in effect these cards would be no different from today's Visa or Mastercharge cards. But it is easy to imagine how — 25 years in the future, after acceptance of such cards had become sufficiently widespread — firms would simply accept, and swap, balances on the MTA's books. (Hence the form of “smart card” in question here differs importantly from the MONDEX card, in which the issuer is always a bank and the redeemer is always a bank.)

Such a system would still involve the use of bank money, but only as the initial base of the value chain. The customer who buys a “smart card” from a nonbank firm would presumably pay for it using a bank check or cash. But to the extent that third parties were willing to accept balances on the nonbank firm's books in payment for their own transactions, there would be no need for the firm that issues the card to maintain bank balances to back up in full its corresponding liability. At that point, nonfinancial transactions made by swapping balances on that firm's books would take place independently of any new, contemporary use of bank money (or cash), and hence independently of any need for reserves at the central bank.

Needless to say, not all nonfinancial firms are equally plausible candidates to undertake this activity. Nonfinancial firms typically do not have access to the safety net that central banks,

deposit insurance funds and other government agencies normally maintain for banks. Hence a customer who buys this kind of “smart card” would have to have confidence in the permanence and soundness the firm issuing it. Moreover, telephone companies and other widely used utilities have the further advantage that nearly everyone buys services from them on an ongoing basis. Even if customers bought a telephone company’s advance-payment card and then found that no merchants would accept it, they could always use the balance on it (which, to recall, represents the company’s liability to them) to pay their telephone bill.

Such a development would involve advancing these card systems, or other forms of e-cash, to the point where they would provide not merely payment but also settlement. At the moment this prospect is hardly imminent. But with rapidly advancing data processing and encryption technology, and the gradual disappearance of the visible distinction between banks and other businesses (importantly including nonfinancial firms) in the public’s perception, the prospect is far from inconceivable a quarter-century in the future. As long as taking deposits and providing payment services is a source of profit for banks, bank customers — like telephone companies, New York’s MTA, or the merchants whom the MTA would like to induce to use its cards — have an incentive to recoup some of their costs by undertaking a form of this activity themselves. And to the extent that they can pass on some of what they recoup to their own customers, individuals will have an incentive to use these alternative payment vehicles just as nonbank firms will have an incentive to provide them.

How would central banks respond? One possibility would be to engage in a regulatory race, in which the monetary authorities in each country continually expanded the coverage of

reserve requirements to blanket new issuers of what amounts to money, while the issuers of private monies responded by continually changing their product in order to evade each new set of expanded requirements. Experience — for example, that of the Federal Reserve System in the 1960s, when the new instruments in question were Eurodollar deposits and negotiable CDs — suggests that this is a race the central banks might well lose.

If so, what would then be left to the central bank would be its control over the remainder of the monetary base, the great majority of which in most countries is not bank reserves but outstanding currency. Although monetary theorists frequently write as if control over “central bank money” were all there was to monetary policy, and sometimes point to empirical correlations between a country’s monetary base and its income or prices, currency has become increasingly irrelevant to legal, domestic transactions. Moreover, the observed correlations between growth of currency and growth of either income or prices mostly reflect the fact that central banks normally just accommodate whatever the public’s demand for currency happens to be. If advances in electronic technology facilitate the use of private nonbank monies, outside the scope of the central bank’s reserve requirements, neither the nickels and dimes used in vending machines nor the \$100 bills used to pay drug dealers will be sufficient to preserve the efficacy of monetary policy.

Cooperation of a central bank’s government can also be an important part of the story. Governments typically make payments, for purposes of income transfers as well as purchases of goods and services, using deposit accounts at banks. It is fair to assume that they will continue to do so. Governments can also easily require that all tax payments be in the form of bank money

(or an equivalent that is settled in bank money). Hence one sector of the economy — a large one in many countries — is a potentially captive market for this purpose. But the government sector is not what most people have in mind when they worry about the central bank's ability to influence nonfinancial economic activity. If private monies not linked to the holding of reserves were to proliferate, the fact that the government pays by check and requires all tax payments to be by bank check would not be sufficient to maintain the effectiveness of monetary policy either.

Proliferation of Nonbank Credit. An entirely different trend, but one that likewise threatens the relevance of the central bank's position as monopoly supplier of reserves, is the declining role of banks (and other depository intermediaries) in advancing credit to the nonfinancial economy. Under the "credit view" of monetary policy, banks are important not because they create deposits but because they make loans. Money creation is merely what happens on the other side of the balance sheet when a bank extends credit. But because the deposits thus created are subject to reserve requirements, this process too generates a demand for the reserves over which the central bank has a monopoly on supply. If the lender is not a bank, however, so that the liabilities behind the loan are not deposits, then credit creation ordinarily implies no increase in the demand for reserves.

In the United States banks have been losing market share in the credit business ever since World War II. In 1950 the financial assets (mostly loans and securities investments) of U.S. commercial banks represented 51% of the total assets of all U.S. financial intermediaries. By 1975 banks' market share had fallen to 38%. Today it is just 24%. Including savings institutions and credit unions, which also come within the scope of the central bank's reserve requirements,

the combined share of the U.S. credit market accounted for by depository institutions was 65% in 1950, but only 30% today. The difference over time primarily represents the rapid advance of pension funds, insurance companies and mutual funds — none of which hold reserves (in the sense of balances with the central bank) against their liabilities. In consequence, economists' empirical research on questions pertaining to the "credit view" of monetary policy mostly focuses not on aggregate business need for credit but only on those firms that are "bank dependent" by virtue of being too small, or otherwise insufficiently known, to borrow from nonbank lenders via the securities market.

There are two reasons, apart from simple extrapolation of past experience, for thinking that the trend toward diminished importance of banks and other depository intermediaries is likely to continue. First, advances in data processing technology, and therefore in the availability of information, are continually reducing the prevalence of the informational asymmetries that give bank-type "relationship" lending an advantage over "arm's length" lending in securities markets. Individual households seeking home mortgage financing, for example, no longer have to sit through extensive interviews with bank loan officers. In uncomplicated cases, which represent the majority of home financing, supplying standard information on line — information that potential lenders can in turn readily verify on line — is sufficient to produce a competitive loan offer within 24 hours.

And second, even for those households and firms that remain "bank dependent," securities markets have now advanced to the point where the bank that investigates the borrower's creditworthiness, originates the loan, and services the credit relationship, no longer needs to hold

the loan in its own portfolio. Instead, today most kinds of bank-originated loans are regularly sold to firms that package them into aggregated portfolios of similar credits, which in turn stand as collateral behind securities owned and traded by market investors — the pension funds and insurance companies and mutual funds that are taking over market share from banks, as well as households who buy these securities directly on their own account.

In the United States, home mortgage lending was the first sector of the credit markets to be securitized in this way, under government sponsorship, and by now more than half (by dollar volume) of all home mortgages outstanding are held by securities market investors rather than by the banks or savings institutions that made the loans. Similarly, nearly two-thirds of government-sponsored student loans, all originated by banks, are securitized. But securitization has only just begun to gain momentum in other sectors of what until recently was primarily the banks' market. Today 28% of consumer credit, 17% of commercial mortgages, and 11% of firms' trade credit is securitized. There is now even a small but rapidly growing market in which banks are securitizing their ordinary commercial and industrial loans.

The import of securitization in this context is simply that it severs even the bank-originated component of the economy's credit extension process from any direct relation to the central bank's system of required reserves. A loan extended by a bank and held on the bank's balance sheet is financed by deposits, which are subject to reserve requirements. (In many countries not all kinds of deposits, and not all forms of nondeposit bank liabilities, are subject to reserve requirements; but this only makes the existing linkage weaker.) The same loan extended by the same bank but securitized and sold to a nonbank investor is financed by that investor's

liabilities or net worth, neither of which is subject to reserve requirements. From the perspective of the “credit view,” therefore, the central bank’s monopoly over the supply of reserves is irrelevant.

Private Bank Clearing Mechanisms. In some countries today — for example, in the U.K. and Canada, and increasingly so among small banks in the United States since required reserve ratios were reduced in 1990 and 1991 — many banks’ motivation for holding reserve balances with the central bank actually has little or nothing to do with reserve requirements. These reserves are, rather, a necessary means of settling interbank transactions through the central bank’s clearing mechanism. On any given day, a bank may have more checks presented for payment than checks deposited. If its reserve balance is insufficient to cover the difference, its account at the central bank will be overdrawn at the end of the day, in which case most central banks will assess a penalty of one form or other. If the central bank does not allow “daylight overdrafts,” the bank must similarly maintain an adequate reserve balance to cover such contingencies even on an intra day basis.

The role played by the interbank clearing mechanism in creating a demand for reserves is far removed from either the “money view” or the “credit view” of monetary policy — or any other standard textbook story, for that matter. (There is some ultimate connection to the “money view,” since the use of bank money in executing day-to-day transactions is what creates the need for a clearing mechanism in the first place.) But nonetheless, and in just the same way, it gives the central bank the leverage to move large markets with tiny operations. The main point is once

again that these clearing needs impose on banks, and therefore indirectly on the economy as a whole, a need for what the central bank is a monopolist over.

But competition can threaten this monopoly too. Private clearing mechanisms like the CHIPS network, and other privately maintained interbank netting systems like those studied in the 1990 report of the ad hoc BIS committee (the Lamfalussy Report), potentially represent just such threats. In a way that is conceptually parallel to nonfinancial businesses' incentive to introduce private monies in order to capture for themselves some of the profit that otherwise accrues to the banks, private clearing mechanisms like CHIPS offer banks the ability to economize on either charges paid or collateral required in central banks' real-time gross settlement systems, like the Federal Reserve System's "Fedwire" or the European countries' systems that are now linked by the E.U.'s TARGET system. The crucial question is who is best situated to be the provider of financial network services. Central banks have some advantages in this regard, but their superiority is not unambiguous. And, again by analogy to the use of private monies, private settlement systems can be (and are) used along with the systems provided by central banks.

Most of the discussion of private clearing mechanisms to date has focused on the risks that they present for a breakdown of the payments system in the event of default, and as of today that prospect is certainly the more serious concern. Moreover, so far even these private mechanisms for clearing interbank accounts rely, at the end of the process, on transfers of central bank money. CHIPS, for example, is a net settlement system in the sense that it nets participating banks' respective claims on one another within the day. But at the end of each day, remaining claims on CHIPS that have not netted out are settled using the Fedwire. Except for the intraday netting,

therefore, banks participating in CHIPS still need reserves at the central bank to settle their payments.

But this need not be so. A private mechanism like CHIPS could evolve into a system of purely bilateral transfers among private banks analogous to the settlement method now used by European countries' central banks, which do not maintain clearing balances at the E.C.B. Another possibility would be transfers of deposits at a single private bank that all the others agreed to use. A quarter-century or so into the future, therefore, it is also readily conceivable that one or more of these private clearing mechanisms may sufficiently erode banks' need for central bank reserves as to undermine the relevance of the central bank's monopoly. If so, it would also undermine the central bank's ability to carry out an effective monetary policy.

Explicitly International Dimensions

One of the most consistent developments in the monetary sphere in the last quarter of the twentieth century has been the increasing irrelevance of nation-state boundaries. The easiest way to see that this is so is simply to note that the number of national currencies has not kept pace with the proliferation of independent countries. One of the few safe predictions about the world 25 years in the future is probably that there will be more countries but fewer currencies.

The disappearing relevance of national borders in this context also prompts several lines of speculation (and each is no more than that) about what the future may bring. Each stems from realizing that the wave of currency consolidation that is now in progress, and likely to continue for the foreseeable future, is mostly not an attempt to rearrange the world into "optimal currency

areas” in economists’ usual sense. In some settings, like Western Europe, the motivation is instead to exploit economic unification, in this instance monetary unification, as the leading edge of political unification. In other settings, especially among smaller countries and in the developing world, the motivation is to mitigate the speculative instabilities that many central banks increasingly face in a world where currencies are convertible, capital flows freely, and market participants in the aggregate (and even some individually) bulk large compared to the assets at the central bank’s disposal.

Especially in the wake of the East Asian financial crisis of 1997-98, much of the discussion of the implications of globalization of financial markets has emphasized the problems posed for a central bank of a small country that is trying to maintain a specific chosen value of its currency. But for this purpose currency policy and monetary policy are the same. Whether the central bank has the resources to withstand speculation against the exchange value of its currency is really the same question as whether the central bank has the ability to control the short-term interest rate on marketable obligations denominated in its currency.

Rapid advances in electronic technology, especially in communications, not only have brought many more investors into the international markets (some on their own account, some via mutual funds) but also have created a much greater degree of coherence in the attitudes and portfolio behavior of investors who remain physically dispersed. As a result, one central bank after another, among economies that are not large but not tiny either, has found itself overwhelmed. Thus far the central banks of the larger industrialized countries have not faced serious inability to control their short-term interest rates. But as financial globalization advances,

this prospect too is hardly impossible. If so, the central banks of the large countries would, in all likelihood, seek to change the rules governing global financial markets in some way designed to maintain their ability to carry out monetary policy.

The tendency for central banks of the larger countries to resist surrendering their monetary policy powers to the forces of global market speculation is likely to be even greater because of some of the lessons learned from the East Asian crisis. Benign assumptions about the workings of speculative markets notwithstanding, it was simply not true that the countries that got into difficulty were exclusively those that were highly indebted, or were running large budget deficits or current account deficits, or had made other obvious policy mistakes, or where transparency of financial dealings and the rule of law more generally were especially weak. What was striking about the crisis as it rolled through one country and then another was the degree of apparent arbitrariness in investors' behavior. Even the explanations offered after the fact, for what had happened to any specific country, often tended to point to national vices that, only a few years before, the international investment community had largely hailed as virtues.

Small countries have little ability to alter the rules of international finance in order to protect themselves from arbitrarily destabilizing speculation. Their only choice is to participate in global markets or not. Large countries, however — and especially the large countries acting in concert — have broader latitude in this respect, and if they feel threatened they are likely to use it. Just what changes in the rules they would most likely seek is harder to say, although the surprising abruptness with which the idea of capital controls has gone from being a taboo subject in polite conversation to a focus of open-minded inquiry is perhaps suggestive. (Indeed, the sheer number

of recently published books hailing the wisdom of the judgments made by unfettered capital markets may itself be a marker that the tide of informed opinion is beginning to turn in a different direction.)

Here too, the likely outcome in many cases is a continued race between regulators and innovators, with the advantage over time probably on the side of the innovators. To the extent that countries act in concert, however, they may gain an advantage in this regard. One of the reasons for the failure of many past attempts at the national level to bring certain classes of transactions with the central bank's regulatory (and reserve requirement) sphere is market participants' ability to move the endangered transactions "off shore." No doubt regulatory havens will always exist, but the more countries were to coordinate their efforts in this dimension the more isolated, and therefore subject to potential discrimination, the remaining unregulated domiciles would become.

Globalization of financial markets also has implications for the ability of central banks to maintain the relevance of their monopoly over the supply of reserves — and hence effectiveness of their monetary policy actions — through their operation of the payments clearing mechanism. International markets magnify the potential ability of private clearing mechanisms to compete with public ones. Moreover, currency substitution opens the way for what amounts to competition among national clearing mechanisms, even if each is maintained by a different country's central bank in its own currency. As firms and households, and therefore banks, use currencies other than that of their own country, the country's geographical space becomes less relevant for indicating over what financial transactions and nonfinancial economic behavior the central bank's

actions have efficacy. (A parallel process is the use of “units of account” other than a country’s currency to denominate wages and other payments.) Hence individual central banks may have influence over geographically dispersed sectors of economic activity, and specific economic disturbances like productivity shocks or oil price shocks may likewise exert their effect on geographically dispersed sectors rather than recognizable national economies.

Finally, what implications follow from the trend toward currency consolidation per se? Living with a common currency means living under the same monetary policy, and hence the same interest rates and exchange rates. When different countries or different parts of the same country have a common currency, therefore, it is highly likely that from time to time the monetary policy that will be best for one will be quite unsuitable for the other. This phenomenon is thoroughly familiar among the disparate regional economies within the United States. (The most obvious example is what happened to Texas in the mid 1980s, when the regional economy was depressed because of falling oil prices but U.S. monetary policy remained highly restrictive as part of the continuing effort to restore nationwide price stability.) There is no reason not to expect the same kind of outcome from time to time among, for example, the member countries of the European Union.

As is well known from the standard theory of optimal currency areas, however, under the right conditions even countries or regions with highly dissimilar economies can happily share a common monetary policy. The usual list of such conditions includes price flexibility, labor mobility, and the ability and willingness to make cross-country, or cross-region, fiscal transfers. Of these, neither price flexibility nor labor mobility seems likely to increase sharply within the

immediate future (although each is really the subject for another paper). What remains, therefore, is the possibility of fiscal transfers.

It is extremely doubtful that the countries that are now pursuing currency consolidation in reaction to financial or economic distress have any prospect of coupling it with any kind of serious international fiscal transfer system. If Argentina goes ahead and abandons the peso in favor of the U.S. dollar, for example, it presumably will not do so in the expectation of compensation from the United States any time the Federal Open Market Committee chooses a monetary policy that may be optimal for the U.S. economy but injurious to Argentina. Countries that are consolidating their currencies as an aspect of desired further political unification, however — like the European Union — are a different story.

Because of the substantial economic heterogeneity that prevails across the participating countries, Europe's new monetary union is very likely to prove unstable in its current form. Much speculation, recently diminished by the euphoria surrounding the euro's successful introduction (to date only as a unit of account), has focused on whether some crisis or other may drive one or more of the union's eleven member countries to abandon the project, and if so, just what that would mean. A more likely outcome, however, is that the pressures of such a crisis — or of repeated crises — would force the creation of a broader union, importantly including coordination of fiscal policies across the member countries (beyond the existing obligation under the Maastricht Treaty to limit government deficits to 3% of national income) as well as fiscal transfers among them.

The logical starting place for such fiscal transfers would be lender-of-last-resort policy and deposit insurance, both of which arise as natural adjuncts of monetary policy even though they are essentially fiscal functions, and both of which (especially lender-of-last-resort actions) may be easier to introduce politically because they arise in the context of actual or threatened financial crises rather than as an aspect of ordinary ongoing circumstances. Beyond lies the entire range of intergovernmental revenue sharing schemes, as well as personal tax and transfer systems, that would enable a member country enjoying a monetary policy that is right for its economic needs to help ease the burden on another member country that is forced to accept the same monetary policy even if its needs are sharply different. Just how far the European Union will go along this route, if that is indeed the probable outcome, is no doubt a matter of the specific time horizon in question. But the thought that monetary union may in time force the evolution of a deeper, more fundamentally political level of unification is probably not inconsistent with what the euro's original architects had in mind.

Concluding Remarks

It is important to be clear that the threat outlined here to central banks' ability to conduct monetary policy, arising from any or all of several ways in which their monopoly over the supply of reserves might become irrelevant, applies to central banks' ability to influence prices in the nonfinancial economy no less than production and employment. Hence even those who believe that central banks should not concern themselves with real outcomes anyway (as a stricter interpretation of the European Central Bank's mission than that given above would imply) cannot

simply sweep the issue aside. If the central bank cannot affect interest rates — in other words, the prices of financial assets — in its country's financial markets, because borrowing and lending in those markets proceed independently of whatever amount of reserves it chooses to supply, it cannot affect the price level of goods and services in the nonfinancial economy either.

Whether, and to what extent, the appropriate response to this loss of monetary policy potency is to be regretted — and, where possible, resisted — depends on fundamental economic presumptions that lie well beyond the scope of this paper. At the most basic level, economic theory provides no clear answer to what would determine an economy's price level if what its inhabitants used as money depended entirely on their own ability and willingness to innovate, without effective restraint from the central bank or some other designated authority. Especially in light of many industrialized economies' success in achieving price stability over the last two decades, and the important role that most observers assign to these countries' central banks in bringing about this achievement, the prospect of diminished central bank effectiveness will not be reassuring.

Similar considerations arise with respect to output and employment. There is no lack of theories to describe how central bank actions can affect nonfinancial economic outcomes, but the quantitative importance of actual monetary policies in accounting for observed business fluctuations remains a subject of empirical debate. Those who discount that importance (in the limit, who believe that monetary policy is “neutral” with respect to nonfinancial outcomes) need not be apprehensive, at least on this ground, about the trends identified here. But for those who believe that monetary policy is a major influence underlying the movement of output and

employment — for example, who credit the favorable economic performance in the United States in recent years in substantial part to the Federal Reserve System — the prospect of diminished central bank potency is a proper object of concern. Whether, and to what extent, to favor aggressive regulatory changes to preserve the economic relevance of the central bank's monopoly over the supply of reserves turns on the same set of issues.

Of course, central banks will still always be able to announce what they want interest rates, or inflation, or output and employment to be. Private economic agents, and especially participants in the financial markets, will continue to pay attention. But without the ability to implement a policy with some independent means of making those intentions come about, such pronouncements will be just that. With nothing behavioral to back them up, they will have about the same force over events as Wang Wei-shao's splendid poems.

TABLE 1

COMPARISONS OF FINANCIAL MAGNITUDES

	Percent of GDP				
	Bank Reserves	Monetary Base	Broad Money	Outstanding Government Debt	Total Domestic Debt Securities
Canada	0.6%	4.0%	43.4%	71.8%	84.5%
Euro-11	1.8	8.8	80.6	n.a.	n.a.
France	0.6	4.0	66.0	47.6	81.9
Germany	2.5	6.8	67.5	38.2	85.4
Italy	4.5	10.0	47.7	101.4	132.8
Japan	1.8	12.2	73.7	79.8	113.6
Sweden	0.6	4.9	47.5	55.4	122.8
Switzerland	2.7	10.6	106.9	21.4	70.7
United Kingdom	1.1	4.0	91.7	35.8	59.8
United States	0.5	6.3	70.5	43.8	163.8

Notes: All figures are percentages of GDP.

U.S. data, as of yearend 1998, are from the Board of Governors of the Federal Reserve System.

Euro-11 data, as of yearend 1998, are from the European Central Bank.

All other data, as of yearend 1997, are from the IMF (for bank reserves, monetary base and broad money) and the BIS (for government and total domestic debt securities).