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# Money, Central Banking, and Monetary Policy in the Global Financial Arena

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JERRY L. JORDAN

Economists talk about producing *output* of goods and services from *inputs* of land, labor, and capital, where capital is taken to mean tools, machines, buildings, and so on. We say that productivity, or productive efficiency, improves when the same amount of output can be obtained with less of at least one input.

Sometimes economists treat money as a factor of production separate from and in addition to inputs of land, labor, and capital. This approach is not a useful way to think about the role of money in society. It is derived from—and maybe reinforces—the idea that there must be enough money in circulation to “meet the needs of trade.” Although this view originated in the nineteenth century, more recent forms are manifest today in claims that central-bank monetary policy is starving the U.S. economy of money and thereby causing interest rates to rise. This false diagnosis is dangerous because it gives rise to a prescription for the central bank to make people better off by creating money at a faster rate.

A more fruitful way to think about the role of money in a market economy is one in which money liberates resources, especially those used to gather information and to conduct private transactions. This view draws attention to the importance of the quality dimension of money. That money facilitates transactions appears to be clear to everyone. Its role in enhancing market knowledge about relative prices, however, is less well understood.

Money’s effectiveness depends largely on its quality. The quality of money is high when the value of money is stable. Money prices provide households and busi-

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nesses with reliable information about the relative costs of goods and services. Households and businesses can then make sound economic decisions, which fosters economic prosperity. The quality of money is low when the value of money is unstable. Money prices then provide households and businesses with unreliable information, so they must devote some of their resources to further investigation of the relative costs of goods and services. Low-quality money wastes resources that otherwise could have been used to enhance people's welfare.

In this article, I consider three issues related to the quality of money. In the first section, I discuss money in a global sense, elaborating on the significance of a stable or unstable value of money in the context of alternative exchange-rate regimes. Next, I turn to central banking, discussing more pragmatic and institutional issues in the production of high-quality money.<sup>1</sup> Finally, I deal with monetary policy, using the current policy situation of the United States to emphasize the critical importance of economic theory in policymaking.

## Money and Exchange-Rate Regimes

No modern economy functions well without a stable standard of value. One job of money is to provide a standard of value or unit of account. Money defines a unit of account—a dollar, a euro, a peso, a yen, a pound, depending on the economy in which you are interested. Division of labor, specialization, markets, and trade all rely on a unit of account that makes disparate commodities and assets comparable in the minds of different people. A stable monetary unit of account is one of the pieces of a Hayekian infrastructure that a market economy requires for efficient operation,<sup>2</sup> along with enforceable private-property rights, generally accepted accounting principles, and sound financial institutions.

Where public contracts are not honored and private contracts are not enforced, markets are impaired. Where title to property is not certain, normal banking is not possible. Where financial statements are not reliable, investment opportunities are obscured. Where the purchasing power of money is not stable, resources are wasted in gathering information or in producing and consuming the wrong things.

Changes in the money prices of goods and assets convey information. If an economy's monetary unit operates as a stable standard of value, then changes in money prices will accurately reflect changes in the relative values of goods and assets. That is, price fluctuations will signal changes in the demand for and supply of goods and assets. Resources will then be shifted toward more valued uses and away from those less valued.

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1. For a "back-to-basics" discussion of commodity-backed currencies and the history of government involvement in monetary arrangements, see the excellent collection of essays in Dowd and Timberlake 1998.

2. Monetary stability—a stable standard of value—is not the same thing as a stable "price level," nor does it mean "zero inflation." For a classic treatment of these terms, see Mises 1949. For an excellent contemporary discussion, see Selgin 1997. An important implication is that the wealth gains emanating from a favorable productivity surprise should be reflected in rising purchasing power of money.

If changes in money prices are contaminated by the changing purchasing power of money, false signals are sent to businesses and households. Bad decisions are made, and resources are misallocated. Standards of living fail to rise at the potential rate. Nominal interest rates respond to shifting expectations about the future purchasing power of money. Changes in real interest rates are obscured. Again, resources are misallocated. Saving and investment decisions are affected, and growth is impaired.

Neither inflation nor deflation enhances economic performance. Unanticipated inflations and deflations induce redistributions of wealth, especially between debtors and creditors, but they leave the average standard of living lower. In the words of a former governor of the Federal Reserve, “a place that tolerates inflation is a place where no one tells the truth.” He meant, of course, that true changes in the relative values of things cannot be observed from stated prices when the purchasing power of money is not stable.

The standard of value is stable—money is sound, the quality of money is high—when people can make decisions in the confident expectation that all observed changes in money prices are changes in *relative* prices, and all observed changes in interest rates are changes in *real* rates.

If, as it is now generally agreed, accelerations and decelerations of inflation do not enhance economic performance, administered devaluations and revaluations of the external value of a currency do not either. If a stable domestic standard of value is optimal, then, as Ludwig von Mises observed, “It is impossible to take seriously the arguments advanced in favor of devaluation” (1949, 790). A government’s decision to alter the exchange rate of a currency that had been fixed involves the breaking of promises. Losses are imposed on someone.

For a society to enjoy maximum prosperity, the internal value of its currency must be stable. If it is not stable, then the external value must ultimately reflect changes in the internal value. Clearly, if the domestic purchasing power of a currency falls, the external value must eventually fall relative to stable currencies. The notion that a country can maintain a permanently fixed exchange rate while tolerating domestic inflation has been proven false many times. That reality has led to increasing advocacy of floating external exchange rates, especially for developing countries that do not have the essential fiscal discipline to resist domestic inflation.

Merely allowing the value of a currency to float, however, does not eliminate the problems that would be encountered in a fixed exchange-rate regime confronted by financial crises. International capital flows have proven to be a mixed blessing to many economies in the post–World War II era, but it would not be desirable to erect obstructions to the free flow of savings from abroad, even if doing so were feasible. Instead, the challenge is to find ways to ensure that access to foreign capital does not so frequently become a curse.

It is important to get the labels right. In economics, as in medicine, if the diagnosis is wrong, it is unlikely the prescription will cure the malady. During the Asian

crises of 1997, broad macroeconomic indicators of fiscal policies, monetary policies, and balance-of-payments accounts did not raise any warning flags. Instead, less-obvious underlying flaws in the domestic financial markets (especially banking companies) were revealed to be pervasive. Undercapitalization, connected lending, inadequate supervision, duration mismatches, uncovered exchange-rate exposures, and other flaws were exposed in the postmortem of the financial duress of the so-called currency crises. Once it became clear to all that the affected countries were not employing “best practices” in their domestic financial markets, it also became clear that the content of previous conditionality had not fostered the development of the Hayekian infrastructure essential to a market economy.

It is tempting to say that what is needed is an international organization responsible for working toward global adoption of sound banking and other financial market practices. However, the idea of empowering a conditionality enforcer of first and only resort is troublesome. Some combination of carrots and sticks will always be present. Whether carrots or sticks dominate will change over time, depending on personalities and political environment. I doubt that anyone would defend the view that what is needed is a global financial policeman, prosecutor, judge, jury, and executioner all rolled into one.

Following Mises (1958), we might think that a “financial night watchman” would better serve as the role model for the professional staff of international organizations that work on behalf of creditor nations. At bottom, most crises fundamentally are neither monetary crises nor exchange-rate crises. Instead, what is common to most crisis episodes are government guarantees or promises that were revealed to be unreliable. The prior presence of government guarantees or implicit promises had induced behavior by actors relying on those guarantees or promises, which altered incentives to the point that risk/reward relationships had become distorted. Sometimes the guarantees took the form of financial instruments, such as *tesabonos* in Mexico; on other occasions, they took the form of exchange-rate pegs, guaranteed loans to domestic banks, or government-agency or nationalized-industry borrowing. The failures of such arrangements in crisis countries often *became* a monetary crisis or an exchange-rate crisis. Market-corroding practices already were undermining sustainable prosperity even before a flight of foreign capital magnified the distortions.

There is little doubt that recent crises reflect the increased scrutiny of, or financial discipline imposed on, a country’s policies and institutions by foreign investors and lenders. Global market participants represent a class of stateless voters, roaming the world’s economies seeking the best wealth-creating institutions. They represent an irresistible force.

There exists, however, a core tension between the interests of market participants and the incentives of local politicians to redistribute, rather than create, wealth. In the end, the forces of wealth creation will dominate those of wealth redistribution. The adjustment process has not been and will not be a smooth one, but achieving discipline will have a positive effect. As the president of Korea once said, the Asian cur-

rency crisis had a silver lining. The current restructuring of banking institutions in Asia will improve those institutions. Without the crisis atmosphere, the reforms would have been much longer in coming.

The past decade has seen considerable financial-market turbulence. In the end, however, evolution toward a more stable global monetary order has taken place. Joseph Schumpeter once said, “The essential point to grasp is that in dealing with capitalism, we are dealing with an evolutionary process. . . . Capitalism, then, is by nature a form or method of economic change and not only never is but never can be stationary” (1950, 82). Schumpeter’s observation about capitalism applies equally well to all the institutions that define the parameters of our global economy. Propelled by technological change and chance economic events, these institutions undergo a continual process of change. The qualities that enhance economic well-being tend to survive, and those that do not will eventually disappear. People adapt institutions—laws, rules, conventions, and customs—to define and enforce property rights and, more generally, to reduce the costs of economic exchange.

The idea that tangible manufactured goods must compete not only in the local shops but also increasingly in the global marketplace is obvious to everyone. Yet the thought that institutional arrangements are also tested against others in the international arena is not so well understood. Ideas must face competition no less than goods and services. Politicians have long known that they must compete, but they have focused on rivals in their own party or in other political parties in their own country. What has been changing is the competition they face from policies and institutional arrangements in other countries. Citizens vote at a local ballot box, but, in a larger sense, financial-asset managers in global capital markets are also casting “votes.”

We are witnessing the difficulty of winning and maintaining the support of these two quite different groups of voters. Domestic ballot-box voters respond well to politicians who pander to their craving for wealth-*sharing* programs. Capital-market voters survey the world for those who pursue the best wealth-*creating* policies. Gaining the support of one is almost certain to diminish the support of the other. The spread of democracy reduces the potential for the even more perverse outcome in which governments redistribute wealth away from their own citizens toward foreigners, via various subsidies or guarantees.

Only a small number of currencies in the world enjoy a reputation that will permit either the issuing government or a private borrower the privilege of selling obligations to foreigners without incurring exchange-rate risk. Moreover, global capital markets may at any time withdraw the privilege of borrowing in one’s own currency. When a currency is not an external standard of value, both fixed and floating exchange-rate systems are vulnerable.

A regime of fixed exchange rates is one in which the government has promised to stand ready to supply foreign currency in exchange for the domestic currency.

Obviously, the reliability of that promise is limited by the amount of such foreign currency that the government already holds (“reserves”) or can borrow.

Under a regime of freely floating exchange rates, the government makes no promise to provide the foreign currency necessary to cover a domestic borrower’s short sales of foreign currency. Therefore, capital inflows involve “uncovered short positions” of domestic borrowers of foreign savings. The risk of exchange-rate depreciation, as well as default, normally would cause the interest rate paid by the borrower to be higher than the foreign-market rate. Often, however, governments seek to minimize the interest differential by providing guarantees of the obligations that domestic banks and other borrowers incur to foreign investors. This arrangement creates an unavoidable moral hazard as risk shifts to general taxpayers. Furthermore, because of the subsidy to borrowers involved in such guarantees, the demand for them will always exceed the amount the government can possibly honor. The nonprice rationing of the guarantees introduces political considerations into the allocation of capital flows. The inherent distortions of incentives undermine the discipline of market forces and all too frequently result in bad investment decisions.

Institutional investors in global capital markets conduct a continuous plebiscite on political and economic policies and developments in the nation-states of the world. Advances in communications and information technologies have been revolutionizing all the financial markets, whether they involve equity, debt, credit, capital, or currency. Adverse judgments by participants in such markets can quickly and dramatically change the price and availability of funds to any borrower, large or small. In the United States in the late 1980s and early 1990s, we heard references to “bond-market vigilantes.” No doubt, government officials in most countries have in the past and will in the future come up against capital- and currency-market vigilantes. It is becoming apparent that government promises—whether in the form of pegged exchange rates or in the form of deposit, loan, or investment guarantees—are endangered species.

International monetary developments in recent years can be explained in the context of powerful economic forces challenging ossified domestic institutions. Among the twentieth-century institutional arrangements coming under increasing scrutiny are central banks and national currencies. Certainly there are national vested interests in maintaining a domestic currency. Moreover, the idea persists that a country has something called “monetary sovereignty” and should therefore pursue an independent monetary policy. History demonstrates, however, that national currencies inevitably compete in the international arena.

If prosperity requires sound, high-quality money, and sound money means stable purchasing power, and the maintenance of stable purchasing power implies that the external exchange rate will remain stable with respect to other currencies with stable purchasing power, where is the benefit of monetary sovereignty to a nation in pursuit of an independent monetary policy? How much can “independence” be worth if,

as someone has said, “freedom is a long string at the end of which one does what one otherwise would have done at the beginning?”

The expression *independent monetary policy* is used in several ways. Sometimes it reflects resignation that national monetary policies can be dominated by an undisciplined fiscal policy. Bad experiences with massive debt monetizations and consequent inflations have fostered efforts to find ways to insulate monetary authorities from the pressures arising from government deficit financing and unfunded pension liabilities. As *The Economist* magazine once put it, “a government that insists on access to the printing press cannot be trusted with it.”

In more globally oriented discussions, however, *monetary independence* refers to an institutional setting that permits a central bank to choose independently “the appropriate rate of inflation” for the national currency. It is increasingly difficult to understand what such a statement means. If it means the “politically acceptable” rate of inflation from the standpoint of domestic constituencies, then it suggests that the inherent inefficiencies of policies that debase the purchasing power of money have greater value than the potential wealth creation they preclude. Unavoidable wealth redistributions and deadweight wealth losses result from debasement of the currency, whether intended or not. Traditional rationalizations for deliberate inflation, such as claims of rigid wages or implications for real exchange rates, seem increasingly quaint. Who can imagine a politician appealing for systematic inflation in today’s stable money setting?

If monetary sovereignty or independence is not worth much in today’s global capital markets, and if seigniorage is small in a noninflationary world, then the costs and risks associated with a national central bank and a national currency become more difficult to justify. Whatever domestic politicians’ views, the trend in the behavior of businesses and households around the world is unmistakable. Gresham’s law has been turned on its head. What we now see—where it is not prohibited by severe punishment—is the use of “high-confidence monies” driving out the everyday use of “low-confidence monies” (Klein [1974] 1993). Just as the brand name of running shoes is more important to consumers than the location of the assembly plant, so too the “brand name” of currency used to denominate contracts and trade assets is more important than the “local content” or “national origin” of the standard of value.

The erosion of barriers to trade in goods and services offers clues to what we can expect in monetary affairs. Today, brand-name recognition and identification of goods are more important than ever. When a company such as Sony produces a new product that is better and less costly than other brands, consumers will want to buy it. Consumers everywhere are the same: they want the best product for a given price. Only barriers to trade might prevent a superior product from gaining global market share.

Brand-name identification is also becoming evident in financial and monetary affairs. In the past, lack of global specialization in the production of goods reflected



governmental and technological constraints. International brand identification evolved as those constraints diminished. As we are now seeing in the monetary arena, brand identification of standards of value—monies—also becomes more pervasive as falling costs of information and advances in communication technologies make it increasingly easy to compare the quality dimension of standards of value.

Countries whose monetary policies in the past have caused large fluctuations in the value of the currency have come under pressure to adopt a system to prevent the recurrence of inflations and devaluations. Currency boards and “dollarization” are among the arrangements forced on governments by their inability to provide a stable purchasing power of the domestic currency. Anna Schwartz (1993) has documented the role of currency boards in the development of central banks. A currency board operates to maintain a stock of foreign-exchange reserves equal to the government’s issue of domestic currency. A loss of reserves automatically reduces domestic currency by an equivalent amount, which counteracts the forces causing the currency drain.

Central banks embody the presumption that human or government discretion can produce better results than an automatic system. Some central banks were created when a currency board was permitted to reduce the ratio of external reserves to domestic money to less than 100 percent. Now the process may be reversing. Nations find that central-bank discretion—monetary sovereignty—simply delays the inevitable and necessary response to external imbalance. A currency board has the advantages of eliminating discretion and tying the currency to the strong monetary unit of another nation.

An alternative would provide a setting in which private currencies might compete with the government’s official money. Recent inquiries into the possibility of private currencies competing with government-issued fiat/fiduciary currencies have considered the potential for the reintroduction of specie-backed currencies. Richard Timberlake has put forth a specific proposal for the United States. He argues, “sound money advocates should not waste their resources lobbying for a gold *standard*, which by definition would include the state as overseer and manager of a gold currency, specifier of a gold price in terms of dollars, custodian of the gold, and continuing manipulator of a central bank-issued paper money. No. The only way to ensure that gold becomes a viable money is first to separate the gold from the state and the state from any further role in the operation of a gold money” (1995, 207).

It happens that U. S. official gold holdings are more than 260 million ounces, approximately one ounce for every man, woman, and child in the country. The Timberlake proposal envisions awarding a certificate worth one ounce of gold to every person as his or her “birthright.” A market for the certificates would emerge, and the certificate holders could redeem them for bars of gold (400 certificates per bar). The gold bars would then be deposited in a private gold repository that would issue certificates/warehouse receipts, as well as create bank accounts for the transfer of title to gold as a means of payment. Legislation requiring specific performance of contracts would allow parties to choose to negotiate settlement of obligations in gold-backed

certificates or gold-denominated balances. Clearly, this possibility would provide competition for the central bank-issued currencies. Whether such a private specie-backed currency could become a dominant standard of value would depend on the performance of the central banks that continue to supply fiat currencies.

Following Hayek, I submit that international monetary relations would benefit from competition among major alternative currency units. Such competition would be more likely to enhance world welfare than systems such as Bretton Woods that mandate direction by supranational governmental bodies and that tend to ossify over time.

Countries can take specific steps to allow and even encourage this competition. The first step would be to remove any capital or exchange controls, including prohibitions on deposits denominated in foreign currencies. Argentina went a step further and clearly signaled its intention to maintain monetary stability by granting people the legal right to contract under any and all conditions in any currency they might choose. Legislation in Argentina requires courts to enforce contracts in the currency specified therein. This *specific-performance* law provides a level playing field for competition among domestic and foreign currencies.<sup>3</sup>

There is no single best way to achieve and maintain a stable monetary standard of value. Even the commodity-backed currencies of the eighteenth and nineteenth centuries were subject to periodic inflations and deflations as new gold or silver mines were discovered or mines were depleted. The great advantage of the gold standard was that it produced a global monetary system in which almost every country in the world had a currency unit that was the equivalent of a certain amount of gold. Therefore, national currencies simply represented different denominations of the global money. There is no reason to expect a return to a global gold standard in the foreseeable future. Currency competition offers the best process for maintaining high-quality money.

## Central Banking

Nations today no longer provide an anchor to their currencies by a legislative declaration of gold value. Since 1973, almost all nations have been operating fiat monetary systems in which the goods-and-services value of a unit of money rises or falls with the parsimony or profligacy with which the central bank issues its money. A central bank is now the only anchor for the purchasing power of a nation's money. But how many different monies and central banks does the world need? With 150 or more "independent" currencies, global trading involves 11,175 or more exchange rates. Of

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3. Specific-performance legislation is not a "legal-tender law." Legal-tender laws require that residents of a country accept a certain currency in settlement of a financial obligation, *even if* they are owed a foreign currency, gold, or bales of hay. Specific-performance legislation requires that the parties deliver what was promised in the contract, even if it is the currency of another country, gold, or bales of hay.

course, there are not really 150 independent currencies. Central banks tend to cluster in groups based on important trading relations. Several central banks will follow a leader by operating so as to maintain a stable exchange rate with the lead currency. In effect, the followers surrender control over their inflation rate to the policy of the leader. The currencies of the leader nations effectually represent the alternative standards of value in the world.

We have important examples of nations that have explicitly forsaken any notion of monetary independence. The twelve nations participating in the new European Central Bank cooperate in issuing the euro. Before the euro, Holland and Austria firmly tied their currencies to the German mark. Ecuador and El Salvador have adopted the dollar, and a decade ago Argentina replaced its central bank with a currency board that ties the value of the peso to the dollar. Leading currencies—the dollar, the euro, the yen, the Swiss franc—seem clearly to aspire to independence from other currencies. Still, regardless of the monetary policy prevailing in any nation, individuals living in most free societies choose whatever currency they want to use as a standard of value, as a medium of exchange, and as a store of value. More than half of international trade is denominated in U.S. dollars. More than two-thirds of all U.S. dollar currency is used by people in other nations, even where prohibited by national laws.

Why does the world have so many central banks? More than two hundred years ago, John Stuart Mill said, “So much of barbarism . . . still remains in the transactions of most civilized nations, that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbors, a peculiar currency of their own.”<sup>4</sup> Mailson da Nobrega, former finance minister of Brazil, has said that by giving up their central bank, nations “not only lose the ability to make monetary policy decisions, but also lose some of their identity.” So, by the same token, creating and maintaining a central bank—and therefore the proliferation of central banks—may have something to do with the need to develop and maintain a national identity. A dominant trend of the twentieth century was the proliferation of national currencies, especially as new nation-states emerged from the breakup of colonial empires and the Soviet Union.

The experience of national independence is sometimes parodied in the following way: the government of a former colony, upon achieving independent nationhood, immediately founded a national airline, adopted a national anthem and rechristened its military band as a national symphony orchestra to play it, and opened a central bank. However unfair this parody might be, it does seem that having a national central bank with authority to emit its own national fiduciary currency was a hallmark of almost all independent nations in the last half of the twentieth century.

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4. Mill as quoted by Robert Mundell in the *Wall Street Journal*, March 30, 2000.

A stronger and more immediately persuasive motivation reinforced this somewhat ephemeral craving for a national identity. Control of a central bank gives a government a safety valve for financing government budget deficits through inflation. Experience has shown that all too often the monetary actions of central banks are really a fiscal instrument—imposing the unlegislated tax of inflation on defenseless households and businesses.

Although governments generally understand the benefits of stable money, they also have a strong incentive to generate unanticipated inflation. This incentive proves especially enticing to politically weak governments, which attach a low probability to a long tenure and therefore heavily discount the more distant gains of economic growth. Through expansion of money, governments can gain seigniorage and levy an inflation tax without the consent of the public expressed through a legislative process. In addition, through unanticipated inflations, governments are sometimes tempted to try to exploit a short-term trade-off between unemployment and inflation.

Once caught off guard, however, the public becomes warier in the future. For their own protection, they reduce their holdings of financial assets denominated in the domestic currency. The spontaneous dollarizations of many countries around the world in the early to mid-1980s exemplify this response. Some governments initially resisted those unofficial dollarizations, but their responses to currency substitutions (such as capital controls) tended to compound the inefficiencies associated with monetary instability.

Ultimately, the only way governments can attain the optimal outcome to the fiat money problem is by developing a reputation for behaving in a responsible manner. Switzerland, a small, open economy, has achieved sustained economic growth with reasonable price stability without the aid of a currency board or the European Monetary Union and without pegging its franc to the currency of a larger, monetarily stable economy.

Although I do not discount the importance of national pride and a budgetary safety valve in explaining the proliferation of national currencies, I suspect that an even more fundamental force has been at work historically. Policymakers, politicians, and citizens, no less than madmen in authority, are to some extent the captives of academic scribblers of the past. That is, our understanding of the choices available to a nation and of the consequences of making those choices inevitably is processed through received wisdom.

The dominant conceptual toolbox for the analysis of central banking in the post-World War II generations, at least until recently, has been demand management of the Keynesian or monetarist variety. The burden of the argument in Keynes's *General Theory* is that monetary policy is essentially powerless to do anything. Likewise, the burden of the monetarist argument through the quantity theory of money is that monetary policy is essentially powerless to do anything except alter the purchasing power of money. Nonetheless, the economic thinking of thirty to sixty years ago

transformed both Keynesian and monetarist theory into economic theories of demand management. Demand for output or labor could be managed relative to supply either directly or through the supply of money. Demand management provided a rationale both for activist countercyclical monetary policy and for a growth strategy in developing nations. The performance of the real economy came to be attributed to the performance of the central bank in offsetting “cyclical” demand disturbances and in maintaining a low-interest-rate environment conducive to economic growth.

For example, consider how a widely used and respected collegiate textbook presented the role of central banking in 1953, twenty years before the gold-exchange standard ended. Keeping money stable in terms of gold might prevent “excessive” expansion or contraction in the money supply, but “no one can reasonably contend that such a policy points the way to anything like an ideal behavior of money. . . . Some other more immediate objective is necessary.” However, “price stabilization cannot be accepted as an unerring guide,” for a variety of reasons (Chandler 1953).

It is indicative of the limited conceptual toolbox of central banking that the words *expectations* and *credibility* did not appear in the index of this 1953 textbook. Today, no one would attempt to explain the results of a central-bank action without reference to market expectations of its future actions and to its credibility as custodian of the purchasing power of the currency. Major breakthroughs in economic theory began to appear in the late 1960s, but they carried over to central banking only with a considerable delay.

In short, for a long time after World War II, the intellectual framework within which central banks operated was a mechanistic Keynesian/monetarist model. Economists would describe the application of the model as single-period, comparative-static analysis. It could not capture the process by which policy might affect the economy; it yielded only the a priori prediction of an “all else equal” mental experiment. Empirical estimation tried to recognize dynamics mostly by introducing distributed lags in the adjustment from one static equilibrium to the next.

Is it any wonder that political leaders the world over adopted national currencies issued by national central banks, when the static framework for thinking about money seemed to promise the moon? The answer to any problem seemed clear. If employment and output seemed sluggish, “Lower the interest rate.” If the balance-of-payments deficit became difficult to finance, “Raise the interest rate to attract capital.” If inflation became troublesome, “Raise the interest rate to restrain demand.” And if funding the government budget deficit became difficult, “Have the central bank create more money to buy more government bonds.” No matter what the problem, a central bank seemed equipped to supply a ready solution.

Many media commentators still view a central bank as the manager of aggregate demand in the economy, unfortunately reflecting what they learned more than a generation ago. Practitioners, however, have seen, or perhaps participated in, past policy failures that can be traced to the inadequacies of the static demand-management view.

Now, after a delay of some thirty years, the academic scribbling that began to appear in the late 1960s is making an impact. The dominant view within central banking today remains that of an institution with a single instrument, whether described as an interest rate or a money growth rate, but that instrument, it is now understood, can be wielded to achieve only a single objective, stable purchasing power of money. Central banking has emerged from behind its facade, changed from an artful panacea to a technology for encouraging economic growth by delivering high-quality money.

## Monetary Policy

In the not too distant future, I hope that young people studying economics in our colleges and universities will find it humorous at best when the professor describes a recent period of history when it was thought that a positive rate of inflation was in some ways desirable—a line of thinking that concluded that a gradually falling purchasing power of money was a good thing! In most countries today, most people would consider it a silly idea for their politicians to suggest that a higher rate of inflation would be desirable.

Of course, powerful and politically expedient or “necessary evil” arguments about inflation continue to be made. For a while, it seemed that central banks and the activity we call monetary policy operated under the cloud of a fiscal-dominance hypothesis. The idea was that any place that found it difficult to constrain government outlays in a range around the amount of tax receipts would also lack the political will to resist the temptation to debase the currency as a form of unlegislated tax. In that sense, monetary policy became a form of fiscal action, an alternative way to finance government expenditures. It was a highly regressive and dishonest form of taxation that also undermined the efficient utilization of resources. Nevertheless, it was politically popular in many places. The ultimate failure of any policy that was tolerant of inflation, however, has undermined its political appeal.

An important question for central banks that issue fiat currencies is, How can we expect to achieve monetary stability in the current environment? Recently, questions have been raised about the implications of rapid technological innovation and increased productivity for the formulation and implementation of monetary policy. Breakdowns in the two most popular frameworks for implementing monetary policy have confounded efforts to deal with these issues. For a long time, people thought about monetary policy in terms of one or the other of the two models mentioned previously. One model has to do with the supply of and the demand for money; the other has to do with the supply of and the demand for output or labor. Each model enjoyed a period when its statistical reliability appeared quite high and it seemed to serve as a useful guide to policy decisions. In the United States and in other countries around world, the supply-and-demand-for-money paradigm worked quite well for much of the post-World War II period. The basic idea behind it was that statisticians could

estimate the demand for money balances. If noninflationary money demand was predictable—stable in a functional way—and if the money supply could be controlled, then (theoretically, at least) the two of them could be kept in balance, and thereby inflation could be avoided. The competing paradigm—summarized by the so-called Phillips curve—focused on the supply of and the demand for output or employment. Statisticians attempted to estimate the noninflationary supply of output (or labor), and policymakers tried to control the demand for it. So both paradigms had an element of supply, and both had an element of demand. Both had something you forecast and something you controlled to try to maintain a balance, and both provided guidance that proved useful for a while.

Today, neither paradigm plays a useful role in thinking about monetary policy. Money-supply management seemed to come apart in the 1990s, particularly in the United States, where the noninflationary target for the money supply proved impossible to estimate. Likewise, the nonaccelerating inflation rate of unemployment that had provided a fixed target for demand management broke down. To our satisfaction, we have witnessed both lower unemployment and lower inflation than had seemed possible.

Instead of using these defective paradigms, I find it more productive to think about monetary policy from the vantage point of interest rates in a stable monetary environment. To explain why, let me back up a bit.

Economists argue that a household's consumption spending tends to reflect its expectation about its longer-term ability to consume. This relationship has been called the *life-cycle hypothesis*. It concentrates on standard or standardized income or, in Milton Friedman's *Theory of the Consumption Function* (1957), "permanent income." The basic idea is familiar to everyone. As transitory changes in measured income or cash flow fluctuate around some longer-term average, household consumption behavior does not (in the short run) fully reflect those transitory changes. Rather, household consumption behavior tends to smooth out such fluctuations over time. Sudden sharp increases in measured cash-flow income are not fully reflected in the corresponding increases in current consumption, nor are sudden rapid declines in measured cash-flow income reflected in corresponding declines in consumption spending.

Traditionally, this theoretical framework has been used by assuming that permanent income is relatively stable over time, whereas transitory changes in measured income are more variable. However, it can also be the case that in periods of significant technological innovations and rising productivity there is a generalized perception that permanent income is rising relative to measured or cash-flow income. People come to form this expectation in a variety of ways. Perhaps fewer or shorter periods of unemployment and growing paychecks lead them to expect not only that their real standard of living has risen, but that it will continue to rise in the future, possibly at a faster rate than previously expected. People come to expect that they will be able to consume more in the present, as well as in the future, than they previously thought. For example,

observing that their savings plans or defined-contribution retirement programs now promise a higher future stream of income than previously, households feel justified in consuming more of their current income.

Perhaps, too, a sustained period of low inflation and increased credibility of the central bank's commitment to maintain a noninflationary environment causes the inflation premium in nominal interest rates to be purged from the financial markets. This event affords households and businesses the opportunity to refinance debt obligations at lower nominal interest rates and thus reduce debt-service burdens. As a consequence, the discretionary component of disposable income is higher than before, creating the opportunity for greater consumption spending out of a given cash flow.

Observing any of the various forces at work in the "new economy" environment, households may conclude that their long-term ability to consume has increased. Not only will they be able to consume more in the future, but through access to credit markets or through reduced contemporaneous savings they can afford greater consumption in the present. As they make the trade-off between present and future consumption by reducing their saving, real interest rates rise.

At the same time, in the business or entrepreneurial sector, an enhanced pace of technological innovation and rising productivity mean that the marginal efficiency of capital is higher. This development also translates into higher real interest rates because the new opportunities will be associated with a higher rate of return on new business investment.

Notice that the higher real interest rate is not a matter of policy choice or of anyone's discretion. Rather, it is a manifestation of the economic forces that result in heightened competitive uses for available productive resources. Real interest rates rise in financial markets to compete with higher returns to capital investment. Recognition of increased wealth in ownership of more productive capital makes consumers join businesses in increasing demands for current resources. Higher real interest rates are a necessary part of the mechanism for resolving these competing claims. They also attract foreign investment, which bids up the real exchange rate and supplies foreign exchange to raise imports to meet household and business demands for current resources.

Higher real interest rates need not imply higher nominal interest rates. Under a gold standard, for example, acceleration in productivity growth and technological innovation would cause the prices of some goods to decline. The institutionalized monetary stability implied by a gold standard means that the price level falls—the purchasing power of money rises—as a result of greater productivity.

The falling price level means that the greater real income (or wealth) is distributed to society in the form of higher real take-home pay. Households can consume more with the same nominal income. One might expect to observe that the discretionary components of an unchanged measured income have increased. The falling



price level also implies that the same nominal interest rates, or possibly even somewhat lower nominal interest rates, correspond to higher real interest rates. The heightened competition between consumers and investors for available resources results in a rationing process in the marketplace between present consumption and augmented future consumption.

Similarly, to take a second example, under a disciplined monetary policy that constrains the growth of nominal final demand, we would expect an acceleration in the pace of productivity growth and technological innovation to put downward pressure on the inherited rate of inflation. In fact, the rate of inflation could turn negative, just as under a gold standard, as a result of accelerated real growth reflecting increased productivity. In any case, the inflation-premium component of nominal market interest rates declines; the same level of market interest rates embodies a higher real interest rate than previously.

Consider a third possibility, that the central bank simply operates to maintain a fixed nominal short-term interest rate. The upward pressure on real interest rates that is a necessary consequence of greater productivity growth and a faster pace of technological innovation initially causes nominal market interest rates to be under upward pressure. Greater and greater injections of central bank money are then necessary in order to maintain the central bank's fixed target for the nominal overnight interbank rate in the face of rising market-determined interest rates. Rising market interest rates mean that the opportunity cost of holding money balances is rising. In turn, the quantity of money demanded is lower and the income velocity of money is higher. The combination of the higher trend growth of velocity and the faster growth of central-bank money means that a higher rate of nominal final demand growth is accommodated by a more expansionary stance of central-bank actions.

In an environment such as this third case, the increase in nominal market interest rates, though initially reflective of upward pressure on real interest rates, will be augmented by a rising inflation premium. Likewise, in this environment, the equilibrium overnight interbank rate is under persistent upward pressure so long as it continues to lag behind market-determined interest rates.

This dynamic process describes an environment in which an acceleration in the pace of technological innovation and productivity can inadvertently become an inflationary process as a consequence of the central bank's passive accommodation of the heightened demands for various forms of credit that are necessary to ration the available real productive resources among alternative competing uses.

I have presented the three cases to show that there is more to monetary policy than meets the eye. Maintaining high-quality money requires careful consideration of the underlying forces of technology before the general outlines of an appropriate policy can be discerned. In the context of unusually large increases in productivity, the central bank may be operating to prevent deflation, not inflation. However, this outcome is unlikely because almost every central bank in the world now implements pol-

icy by setting a fixed short-term interest rate. The danger of such an operating procedure is that failure to raise the rate in concert with productivity-driven increases in market rates will produce inflationary increases in central-bank money.

## Conclusion

Permitted the choice, people prefer high-quality money. Yet the past century is littered with instances in which national central banks failed to provide a stable standard of value. It now seems that the era of government monopolies of the domestic standard of value is drawing to a close. Competition among competing private and public suppliers should be permitted to provide consumers with a choice—a choice that economists declare will enhance their well-being.

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